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Keywords: Corporate Governance, ESG, Financial Technology, Retail Investors

JEL Classifications: G11, G14, G24, G41, K22

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1. Introduction

What influence do retail shareholders have on corporate governance? Finance and legal scholars have long debated and analyzed the impact of changes in shareholder base (from retail to institutional or vice versa) on corporate governance and performance. The primary empirical challenge has been the problems of endogeneity: while a change in shareholder base can have an effect on firm governance and performance, better or worse performance or governance can also attract certain types of investors. The existing scholarship has attempted to disentangle the effects by trying to identify an exogenous shock to the system (such as a firm's inclusion in a stock market index) (Appel et al. 2016).

In this paper, we attempt to shed light on this issue by using the sudden abolition of trading commissions by major brokerages in 2019 as a potential natural experiment. The (wide) introduction of commission-free trading by major brokerages substantially reduced retail investors' cost of entering the stock market and can be linked to an increase in retail ownership at certain firms. Given that the introduction of zero-commission trading was not influenced by firm characteristics, by examining the effect of zero-commission trading and subsequent changes at firms, we attempt to uncover the impact of having more retail shareholders on firm governance and performance.

Foremost, we find evidence consistent with the reduced entry cost translating to a significant increase in retail ownership (and a concomitant decrease in institutional stockholding). The effect of increased retail ownership, however, was not uniform across all firms. Rather, this effect was more pronounced in firms that were already popular with retail investors, as measured by lower institutional ownership. In an event study analysis, we find that firms with higher existing non-institutional ownership tended to experience greater positive abnormal returns on October 1, 2019, when the major brokerages unexpectedly announced the introduction of zero commission trading platforms. We then show that companies with higher abnormal returns on that day also saw a steady rise in non-institutional ownership in the years immediately after the advent of zero-commission trading.

Turning to the consequences on corporate governance, we first show theoretically that if retail shareholders are not as active (either directly or indirectly) as institutional shareholders, an influx of retail investors and exit of institutional investors does not automatically translate to a decline in influence by remaining (including passive) institutional investors.[1] The theoretical ambiguity, therefore, leaves it open for an empirical assessment. On the empirical side, we foremost find that retail investor entry led to a significant decline in shareholder participation in governance, as measured by shareholder voting. Our "treatment group" consists of firms that experienced larger (more positive) abnormal returns around the abolition of trading commissions on October 1, 2019. Studying proposal-level voting data, we find that these firms saw a significant jump in non-voting after the introduction of zero-commission trading. Treated firms also experienced a deterioration in environmental, social, and corporate governance (ESG) metrics after 2019. This deterioration in ESG scores is consistent with an increase in the (relative) influence of retail investors, who typically exert less pressure on

[1] This is in contrast to a situation where passive institutional investors increase their holdings. In such a case, passive institutional shareholders' influence over management will always increase. The reason for the ambiguity, as demonstrated in more detail in the theory section, has to do with retail investors' lack of participation and other (active) institutional shareholders' vote (or exert influence) in line with passive institutional shareholders. For instance, if retail investors never vote and active institutions do not vote in line with passive institutions, an increase in retail ownership and a concurrent decrease in active institutions' ownership can actually increase the relative power of passive institutions.

corporations to enact prosocial policies than institutional players (Brav et al. 2022). However, we find no evidence that treated firms perform any differently when we study board independence or gender diversity.

If retail shareholders do not participate as much in shareholder meetings and do not exercise their voting rights, this could also have an implication for the companies in terms of their ability to satisfy various legal requirements (such as quorum) and to elect directors and passing proposals.[2] To examine what impact the increase in retail ownership may have in making it more difficult for companies to hold shareholder meetings, we hand-code corporate changes to quorum requirements in the years around the abolition of commissions. Consistent with the prediction, we find that firms have become dramatically more likely to amend bylaws to reduce the percentage of shares required for a quorum at shareholder meetings in recent years.[3] Moreover, the treatment group of firms that experienced the highest abnormal returns around the abolition of commissions were especially likely to decrease quorum requirements. Companies most affected by zero-commission trading thus seem to have changed their bylaws to account for the rise in retail ownership and consequent decrease in shareholder voting.

Our main specifications include firm- and year-fixed effects, allowing the regression estimates to account for within-firm and within-year variation in the dependent variables. Furthermore, pre-trend analyses suggest that the results are not driven by preexisting differences between firms that experienced the highest abnormal returns around October 1, 2019 and other companies. The relationship between preexisting retail ownership and abnormal returns on October 1, 2019 persists when we re-run the analysis on matched and entropy-balanced samples. Finally, a placebo event study shows that the influx of retail investors at treated firms was driven by zero-commission trading rather than the subsequent introduction of fractional trading.

This paper makes two principal contributions to the literature. First, as briefly mentioned in the opening paragraph, the paper adds to the literature on the distinctive role of retail investors in corporate governance. As individuals with small stakes in firms run by professionals and lacking the ability to monitor managers, retail investors can be seen as rationally apathetic toward corporate affairs (Black 1990). Existing empirical evidence suggests that retail shareholders are far less likely to vote than other stockholders and are less concerned with pushing management to better its ESG performance (Brav et al. 2022). Earlier scholars have also documented how an (exogenous) increase in institutional ownership leads to better corporate governance and performance (Aghion et al. 2013, Appel et al. 2016). Our results, showing a decrease in shareholder voting and deterioration in ESG scores at firms exposed to zero-commission trading, are consistent with this literature on retail investor influence in corporate governance. It also is consistent with the earlier results of the impact of institutional ownership on better corporate governance. This paper's contribution lies in establishing a causal relationship between the 2019 abolition of entry costs for retail investors and the subsequent

[2] Lawyers and other corporate governance practitioners to whom we spoke confirmed that the influx of retail traders in recent years has led to concrete changes in corporate governance, due to these investors being less likely to vote than institutional shareholders.

[3] Under state corporate law, including most importantly Delaware corporate law, when a company's charter grants the rights to unilaterally amend its bylaws to the directors, directors can exercise that right to change the quorum. See Choi and Min (2018).

corporate governance changes consistent with retail shareholders' apathy toward corporate governance in general and ESG in particular.[4]

Second, the paper also advances the literature on the role of entry costs in determining whether individuals enter the stock market. Previous experimental work looking at Scandinavian lottery winners and the inheritors of large bequests has shown that a modest fixed entry cost can explain why many retail investors choose not to invest in the stock market (Andersen and Nielsen 2011, Briggs et al. 2021, Vissing-Jorgensen 2002). Our study is broadly consistent with these papers: the removal of the relatively modest trading commissions led to a significant systematic increase in retail ownership at affected firms. However, unlike previous studies, our finding does not rely on experimental data and instead documents a relationship between entry costs and retail investor entry into a broad swathe of publicly traded U.S. companies.

The paper is organized as follows. In Section 2, we describe the background literature on the role of entry costs in individuals' decisions to enter the stock market. Section 2 also surveys the evidence on retail or institutional investor behavior. Section 3 presents a simple model exploring the effects of changing the composition of investor base on voting outcomes. The model yields the testable empirical hypothesis that the replacement of institutional investors by retail investors will lead to an increase in shareholder non-participation in corporate governance. Section 4 describes the different sources of data used in our empirical analysis and presents summary statistics. Section 5 details the events surrounding the October 1, 2019 abolition of trading commissions by major brokerages, and shows how stocks that were already popular with non-institutional investors exhibited the highest abnormal returns that day. Section 5 also shows that zero-commission trading led to a persistent increase in non-institutional ownership at firms that had the highest abnormal returns on October 1, 2019.

Section 6 documents the corporate governance effects of zero-commission trading. We find that treated firms saw an increase in shareholder non-participation, as measured by the percentage of votes that were neither cast for or against a proposal, nor marked as abstentions. We also show that the treated group saw a decrease in its ESG scores, consistent with pro-ESG institutional players being replaced by retail investors who are relatively apathetic about corporate prosocial behavior. However, treated firms did not experience a significant change in board independence or gender diversity. Finally, Section 6 finds that firms with high abnormal returns on October 1, 2019 were more likely to subsequently decrease quorum requirements, consistent with practitioner reports that retail investor non-voting has made it harder for companies to conduct their meetings. Section 7, which contains various robustness tests described earlier, supports the robustness of the relationship between zero-commission trading and retail influence on corporate governance. The last section concludes the paper with possible implications and issues for future research. The appendix contains all the figures and tables (with regression results).

[4] In earlier work, we found similar stock return reactions to zero-commission trading, as well as subsequent changes in corporate governance, for a handful of companies popular among retail investors and known as "meme stocks" (Aggarwal, Choi, and Lee 2023). This paper broadens the earlier work by generalizing it to the broad array of firms popular with retail investors.

2. Background and Relevant Literature

The impact of shareholder base on corporate behavior has been one of the most important questions that finance and legal scholars have examined over the years. While a sweeping generalization is not possible, the existing research suggests that as the share of institutional ownership (even passive institutional ownership) rises, firms tend to be better governed and to perform better. The biggest challenge in this area, as alluded to earlier in the introduction, is dealing with the problems of endogeneity: shareholder base can affect firm governance and performance, but the latter will presumably also affect what types of investors would decide to become shareholders. Aghion et al. (2013), for instance, showed that greater institutional ownership is associated with more and better innovation, as measured by R&D spending. The study, however, is based on long-term panel dataset of over 800 public companies in the US and has difficulty making a more concrete causal claim.

Later studies attempt to deal with the reverse causality issue more directly by identifying certain exogenous changes in the ownership structure. By far the most popular change the scholars have utilized is the reconstitution of certain stock market indexes, such as Russell 1000 and 2000. The underlying story is that when a company's stock gets included (or excluded) from an index, this leads to an increase in institutional ownership particularly by (mostly) passive funds that rely on an index-based investment strategy. Utilizing such technique, Boone and White (2015) find that an inclusion in Russell 1000 and 2000 indexes leads to greater management disclosure, more analysts following, and higher liquidity. Using the similar technique and examining the impact on corporate governance more directly, Appel et al. (2016) show that an inclusion in the indexes also lead to better governance structures, such as more independent directors, removal of antitakeover devices, and more equal voting rights.[5] Chen, Dong, and Lin (2020) similarly find that the index inclusion leads to better CSR ratings, arguing that institutional shareholders can generate positive social impact.

Other scholars have examined the behavior of institutional and retail shareholders more directly. With respect to retail shareholders, earlier research has shown that, while institutional shareholders actively participate in voting, retail investors generally show limited interest in voting their shares. According to Kastiel and Nili (2016), retail investors make up approximately 25% of the average public company's shareholder base, but their votes amount to only about 10% of votes at annual meetings. This decline in retail voting has been consistent over the past two decades, with retail investors voting for only 29% of their shares, compared to the substantial 90% vote rate of institutional investors. (Broadridge 2015). Research suggests that retail voter participation varies based on factors such as stake size, the company's return on assets, and the presence of ISS-opposed proposals on the ballot. (Brav et al. 2022). Smaller firms, for example, tend to experience higher retail voter participation. From 2012 to 2015, the retail participation rate decreased by 1% annually, reaching 28% in 2016 and then increasing by 1% to 29% in 2017. In addition to being disinclined to vote in annual corporate meetings, retail investors also tend to exhibit different preferences from institutional investors in how they vote. Brav et al. (2022) document that ESG shareholder proposals tend to receive weaker support from retail investors as compared to the overall sample. Nevertheless, the low turnout of retail investors underscores the dominance of institutional investors in election results.

[5] Wei and Young (forthcoming) question the validity of using index reconstitution as an identification strategy, claiming this reflects a selection rather than treatment effect.

3. Theoretical Model and Hypothesis Development

In this section, we present a simplified model to generate empirical predictions. What are the implications of an increased retail ownership on corporate governance? A priori, there is no clear answer. On the one hand, the decrease of non-institutional ownership might suggest that institutional investors' voting power will be reduced; thus, one might suspect that their preferred corporate policies may be less likely to be implemented. On the other hand, as the literature review illustrates, retail investors are in general much less likely to vote (or to attempt to indirectly influence management) compared to institutional investors. This pattern might indicate that, with more passive retail investors, despite their reduced overall ownership, institutional investors may wield *comparatively* greater voting power within the universe of the shares voted. For this reason, the critical inquiry is which investor group is being replaced by the incoming retail investors, and how their respective voting patterns differ. In this section, we consider a simple model to analyze these dynamics.

Suppose there are three groups of shareholders: (1) passive institutional shareholders; (2) active institutional shareholders; and (3) retail shareholders.[6] Consistent with the findings from Appel et al. (2016), we assume that passive institutional shareholders (such as index mutual funds and pension funds with diversified holdings) do not exit the company and always vote and exercise their franchise rights as shareholders. At the same time, both active institutional shareholders (such as hedge funds or actively managed mutual funds) and retail shareholders are more likely to engage in entry and exit and are comparatively less likely to exercise their shareholder franchise rights.

Suppose, initially, the fractions of respective types of shareholders are given by: α for the passive institutional shareholders, β for the active institutional shareholders, and γ for the retail shareholders, where $\alpha + \beta + \gamma = 1$. As already mentioned, while passive institutional shareholders always vote, the probability that the active institutional shareholders vote on any given corporate governance matters is $\lambda \in [0,1]$ and the corresponding probability for the retail shareholders is $\mu \in [0,1]$. Given the generally low level of participation by retail shareholders, we assume $\lambda > \mu$. Furthermore, conditional on voting, the probability that the active institutional shareholders' votes are consistent with those of passive institutional shareholders is $\rho \in [0,1]$ and the corresponding probability for the retail shareholders is $\sigma \in [0,1]$. While it may be natural to assume that $\lambda > \mu$, whether active institutional shareholders vote more like passive institutional shareholders, compared to retail shareholders, may likely depend on the issue. Hence, we assume that $\rho \lessgtr \sigma$.

When there is an issue to be voted on, the fraction of shares that cast votes will be equal to $\alpha + \beta\lambda + \gamma\mu < 1$. The fraction of votes that endorse the passive institutional shareholders' preferences are given by: $\alpha + \beta\lambda\rho + \gamma\mu\sigma < 1$. The fraction of non-votes is given by $\beta(1-\lambda) + \gamma(1-\mu)$ and the fraction of shares that vote against the passive institutional shareholders' preferences is given by: $\beta\lambda(1-\rho) + \gamma\mu(1-\sigma)$.[7]

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[6] It is important to distinguish between active institutional investors (who trade according to information) and passive institutional investors (who consistently hold on to their shares). Although retail investors can also actively trade based on the news of October 1, 2019, the eventual increased retail ownership suggests that some institutional investors sold their shares in respond to the news and these were in turn purchased by newly-entered retail investors.

[7] We can allow for all three ways of casting one's vote on a proposal: vote yes, vote no, or abstain. To the extent that other shareholders' votes do not align with the passive institutional shareholders' vote, we can treat them as being against the passive institutional shareholders' expressed preferences.

One straightforward way of measuring the passive institutional shareholders' influence on voting matters is to take the difference between the fraction of votes that align with the passive institutional shareholders' preferences and the fraction of votes that are against. When we do so, we get:

$$\alpha + \beta\lambda\rho + \gamma\mu\sigma - \big(\beta\lambda(1-\rho) + \gamma\mu(1-\sigma)\big) = \alpha + \beta\lambda(2\rho - 1) + \gamma\mu(2\sigma - 1).$$

Note that, conditional on $\rho > 1/2$ and $\sigma > 1/2$, as $\beta\lambda$ or $\gamma\mu$ increases, the passive institutional shareholders' degree of influence over corporate policies will increase. The opposite will be true when $\rho < 1/2$ or $\sigma < 1/2$. In other words, the expressions $(2\rho - 1)$ and $(2\sigma - 1)$ tell us how closely active institutional shareholders' and retail shareholders' preferences are aligned with those of the passive institutional shareholders. All of this is prior to the new influx of retail investors.

Now suppose there is a change in shareholder base in such a way that the three respective types of shareholders' ownership fractions changes to $\alpha + \delta_1$, $\beta + \delta_2$, and $\gamma + \delta_3$, where $\delta_i \gtreqless 0$ and $\delta_1 + \delta_2 + \delta_3 = 0$. If we are thinking of a scenario where passive institutional shareholders are increasing their ownership interest while the other two types are exiting, we would have $\delta_1 > 0$ while $\delta_2 < 0$ and $\delta_3 < 0$. Similarly, if retail shareholders are entering the shareholder base while the institutional shareholders are exiting, we would have $\delta_3 > 0$ while $\delta_1 < 0$ and $\delta_2 < 0$. When the shareholder composition changes, given the different propensities of voting, the overall participation rate will also change. After the change, the fraction of votes becomes:

$$(\alpha + \delta_1) + (\beta + \delta_2)\lambda + (\gamma + \delta_3)\mu = \alpha + \beta\lambda + \gamma\mu + (\delta_1 + \delta_2\lambda + \delta_3\mu).$$[8]

With the identity of $\delta_1 = -\delta_2 - \delta_3$, the last expression in the parenthesis becomes $-\delta_2(1-\lambda) - \delta_3(1-\mu)$. Not surprisingly, when $\delta_1 > 0$, $\delta_2 < 0$, and $\delta_3 < 0$, we see that $-\delta_2(1-\lambda) - \delta_3(1-\mu) > 0$ and the fraction of shares that vote increases. By contrast, when $\delta_3 > 0$, $\delta_1 < 0$, and $\delta_2 < 0$, assuming that $\lambda > \mu$, $\delta_1 + \delta_2\lambda + \delta_3\mu = \delta_1(1-\mu) + \delta_2(\lambda - \mu) < 0$ and the fraction of shares that vote decreases.

From the fraction of votes expression, we see that when the new shareholders are (much) less likely to exercise their franchise rights, this can create a problem of satisfying the quorum for the companies. For instance, when $\delta_1 \approx 0$, and $\delta_2 < 0$, and $\delta_3 > 0$, i.e., retail investors enter while active institutional investors exit, given our assumption that $\lambda > \mu$, we have $\alpha + \beta\lambda + \gamma\mu + (\delta_1 + \delta_2\lambda + \delta_3\mu) < \alpha + \beta\lambda + \gamma\mu$. In such a case, a corporation may feel pressured to reduce the percentage of shares needed for a quorum at shareholder meetings, in order to be able to elect directors and pass necessary resolutions.

What about the influence of the passive institutional shareholders? With the change in shareholder base, the measure of the passive institutional shareholders' influence becomes:

$$(\alpha + \delta_1) + (\beta + \delta_2)\lambda(2\rho - 1) + (\gamma + \delta_3)\mu(2\sigma - 1)$$

[8] The model assumes that the incumbent retail investors and the newly entered retail investors have the same probability of voting their shares. But this overlooks the fact that these are different groups of retail investors: the former group was already invested in the capital markets, while the latter group was deterred from entering the market due to small trading commission fees. In practice, there may be a reason to believe that the latter may be even less likely to vote (than the former), given their sensitivity to transaction costs.

$$= \alpha + \beta\lambda(2\rho - 1) + \gamma\mu(2\sigma - 1) + \{\delta_1 + \delta_2\big(\lambda(2\rho - 1)\big) + \delta_3\mu(2\sigma - 1)\},$$

where the last expression in the curly brackets measures the change in the passive institutional shareholders' influence. As earlier, with the identity of $\delta_1 = -\delta_2 - \delta_3$, we get: $\delta_1 + \delta_2\big(\lambda(2\rho - 1)\big) + \delta_3\mu(2\sigma - 1) = \delta_2(\lambda(2\rho - 1) - 1) + \delta_3(\mu(2\sigma - 1) - 1)$. Given the assumptions on $\{\lambda, \mu, \rho, \sigma\}$, we have: $\lambda(2\rho - 1) - 1 < 0$ and $\mu(2\sigma - 1) - 1 < 0$.

Two special cases of interest are: (1) when passive institutional shareholders increase their ownership interest while the other two types of shareholders exit, and (2) when retail shareholders increase their ownership while the (active) institutional shareholders exit. First, when $\delta_1 > 0$, $\delta_2 < 0$, and $\delta_3 < 0$, we have: $\delta_2(\lambda(2\rho - 1) - 1) + \delta_3(\mu(2\sigma - 1) - 1) > 0$. That is, when the passive institutional shareholders increase their holdings, their influence over corporate policies grows. The converse is not true, however. As for the second case, when $\delta_3 > 0$, $\delta_1 < 0$, and $\delta_2 < 0$, we have $\delta_2(\lambda(2\rho - 1) - 1) + \delta_3(\mu(2\sigma - 1) - 1) \gtreqless 0$. This is because while $\delta_3(\mu(2\sigma - 1) - 1) < 0$, when $\delta_2 < 0$, we get $\delta_2(\lambda(2\rho - 1) - 1) > 0$. When retail shareholders increase their holdings while the institutional shareholders exit, the passive institutional shareholders' influence can either increase or decrease. The answer depends on, among others, relative alignment of passive institutional shareholders' preferences with those of active institutional shareholders (ρ) and the retail shareholders (σ). For instance, when active institutional shareholders' preferences are not aligned with those of passive institutional shareholders, i.e., $\rho \approx 0$, we are more likely to have $\delta_2(\lambda(2\rho - 1) - 1) + \delta_3(\mu(2\sigma - 1) - 1) > 0$ and the passive institutional shareholders' influence will in fact *grow* as retail shareholders increase their ownership.

More generally, whether the large institutional shareholders' influence will increase or decrease will depend on, among others, two important factors: (1) probability of each shareholder type exercising their franchise rights (λ and μ) and (2) the propensity of each shareholder type voting in line with the passive institutional shareholders ($2\rho - 1$ and $2\sigma - 1$). If we were to assume that the retail shareholders' participation rate is lower than that of small institutional shareholders, $\lambda > \mu$, when the degrees of preference alignment are positive but about the same, i.e., $2\rho - 1 \approx 2\sigma - 1 > 0$, the shift of shareholder base towards retail shareholders will decrease the influence of the passive institutional shareholders. Presumably, the propensity for each shareholder type to exhibit voting behavior that is aligned with the passive institutional shareholders will depend on the issue. One would assume that the retail shareholders' preference alignment is different between environmental and social issues compared to governance issues. More specifically, Chen et al. (2020) and Brav et al. (2022) suggest that (passive) institutional investors are more likely (than retail investors) to vote in favor of adopting pro-ESG measures. There is also evidence that active institutional investors, such as hedge funds or index funds, are actively supporting ESG measures. (Nathan 2018, Barzuza et al. 2020). In terms of our model, this would suggest that $\rho > \sigma$, and rhus, when $\delta_3 > 0$, $\delta_1 \approx 0$, and $\delta_2 < 0$, the overall effect would tend to be diluting passive institutional investors' voting power.

4. Data and Summary Statistics

This paper's empirical analysis is based on a mix of subscription and hand-collected data. In this section, we explain the different sources for the data used in our various empirical tests. Unless otherwise mentioned, we collect information for the period from three years before to three years after the abolition of trading commissions (i.e., between October 1, 2016 and October 1, 2022). Table 1 collects the definitions of the different variables used in the paper's empirical analysis. Table 2 presents summary statistics for the different tables used in the empirical analysis in Panel A.

One of the main outcome variables of the paper is the fraction of a company's shares owned by non-institutional holders. While the institutional background and theoretical model detailed in Sections 2 and 3, respectively, outline a link between the advent of zero-commission trading and retail ownership, we lack firm-level data about the percentage of shares held by retail participants. Instead, we proxy retail ownership by the fraction of shares not held by institutional investors. The data for institutional ownership comes from the Thomson Reuters 13-F institutional holdings dataset. This dataset contains information about the fraction of a company's shares held by relatively large institutional investors. We construct a continuous variable *Non-Institutional Ownership* to equal 1 minus the fraction of total institutional ownership reported in 13-F filings, winsorized at the 1% level. If the advent of commission-free trading incentivized retail investors to participate in the stock market, we should expect stocks that were already popular with retail investors (and thus experienced positive abnormal returns on October 1, 2019) to see a subsequent increase in non-institutional ownership.

We use standard sources for firm stock prices and time-varying financial controls. Stock price data comes from the Center for Research in Security Prices (CRSP). We use Compustat to get information for firm size, as proxied by the natural logarithm of firm assets and profitability as measured by return on assets (net income divided by assets, as in Heese et al. 2022). There could be some concern that these time-varying controls are endogenously affected by the introduction of zero-commission trading: for instance, the profitability of firms popular with retail traders could change after new retail investors purchase their stock after 2019 (Gormley and Matsa 2016). None of the paper's main results are sensitive to whether we include these financial controls. The concern over endogenous controls also drives our decision to only use firm size and profitability as financial controls, although our empirical analysis is robust to further controlling for variables such as cash ratio (ratio of cash to assets) and debt ratio (ratio of debt to assets). We collect information on firm ESG performance using the ESG scores reported in the MSCI ESG Ratings data. The MSCI data is the standard measure for ESG in the corporate finance literature, and is used by banks, insurers, and institutional investors when incorporating ESG considerations into their investment decisions (Chen et al. 2020, Pástor et al. 2022). We have access to ESG scores for reporting dates in the MSCI data between October 1, 2017 and October 1, 2021, i.e., two years after the abolition of trading commissions by major online brokerages.

We obtain information on shareholder voting at the proposal level from the Institutional Shareholder Services (ISS) database. Following Geoffroy (2018), we define shareholder non-participation as the percentage of outstanding votes that were not cast for or against the proposal or marked as abstentions. We winsorize the shareholder non-voting rate at the 1% level. We use BoardEx to collect information about board composition for the firms in the Compustat dataset at the firm-year level. Specifically, we collect summary information about the percentage of the board that is classified as independent directors and the percentage of directors who are women.

Finally, we hand-collected information on changes in quorum requirements from Bloomberg Law's tool for searching within the SEC's Electronic Data Gathering, Analysis, and Retrieval system (EDGAR). Specifically, we searched for "quorum" within Item 5.03 of corporate 8-K filings, which is the section in which firms disclose amendments to their charters or bylaws. We restricted the search to filings between October 1, 2016, and October 1, 2022, i.e., three years before and after the introduction of zero-commission trading. We included any change in quorum requirements, including both increases and decreases in the percentage of outstanding shares required to comprise a quorum at shareholder meetings.[9]

5. Zero-Commission Trading and Retail Ownership

In this section, we establish two central results that inform our argument on the effect of retail investors' entry costs and their influence on corporate governance. First, we show that firms that were already popular with retail investors—as proxied by a high share of non-institutional ownership just before October 1, 2019—experienced positive abnormal stock returns when the major online brokerages announced that they were introducing zero commission platforms for (retail) investors. The result indicates that there seems to have been a clear relationship between a company's appeal to retail investors and the effect of zero-commission trading on its firm value. Second, we find that stocks experiencing higher abnormal returns on October 1, 2019 subsequently saw a significant increase in non-institutional ownership (based on the 13-F data). This uptick in non-institutional ownership is consistent with retail investors finding it easier to invest in stocks that already appealed to them before 2019 once the online brokerages had eliminated trading commissions and thus reduced entry costs.

We first conduct an event study using the standard Fama-French three-factor model to estimate the abnormal return for stocks in the Compustat database. We use a 100-trading-day estimation window to measure the expected returns for each stock, as in Takaoka (2006). We define the event window as October 1, 2019, the day the brokerages announced that they will introduce zero commission platforms. There is strong reason to believe that the market priced in the effect of commission-free trading on the day of the brokerages' announcement itself. Charles Schwab, E-Trade, and TD Ameritrade shares dropped 10, 16, and 25 percent on October 1, 2019 itself (Bernard 2019). According to one source, Schwab's announcement on October 1 "sent shock waves across Wall Street," and industry experts concluded the same day that commission-free trading was the inevitable market equilibrium (Gittelsohn and Massa 2019). We only keep firms for which we have at least 70 trading days of return information during the estimation window. Our results persist if, instead of the Fama-French model, we use the four-factor model of Carhart (1997).

To assess whether the abolition of trading commissions differentially impacted firms that are popular with retail investors, we regress the abnormal return on October 1, 2019 against non-institutional ownership as measured just before the Schwab announcement. Institutional ownership in the 13-F data is reported on a quarterly basis. Coincidentally, September 30 of every year is one of the reporting dates. We fortuitously have the non-institutional ownership for each firm for the day just before Schwab's announcement that it was introducing commission-free trading. Panel B of Table 2 compares the non-institutional ownership from September 30, 2019 as well as basic financial variables for firms with above- and below-median abnormal returns on the day Schwab announced it

[9] The Bloomberg law search was over-inclusive because it included many irrelevant references to the quorum for meetings of the board of directors. Since we are only interested in the quorum for shareholder meetings, we removed such search results from our hand-coded sample.

was eliminating trading commissions. Panel B shows that firms with above-median abnormal return had 12.77% higher non-institutional ownership just before the abolition of commissions (0.468 versus 0.415), and this difference was statistically significant ($p<0.01$). Firms with above-median abnormal returns were not significantly larger or smaller than other companies, but were more profitable. We also compared these firms' cash ratio and debt ratio. Firms with above-median abnormal returns were more leveraged and had lower cash ratios than other companies, with each of these differences being statistically significant.

Table 3 presents the results of the event study regression, in which we use robust standard errors and display both the baseline results as well as with controls for firm size and return on assets from the 2019 fiscal year. Non-institutional ownership has a positive and highly significant coefficient whether or not we control for firm financials. The baseline results in column (1) imply that a one-standard deviation increase in non-institutional ownership as of September 30, 2019 corresponds to an abnormal return on October 1, 2019 that is 0.065 percentage points higher. In other words, firms that were already attractive to non-institutional owners (which we take as a proxy for higher retail ownership) experienced positive abnormal returns the day Schwab abolished commissions. The coefficient for retail ownership remains significant when we cluster the standard errors by industry (as defined by two-digit standard industrial classification (SIC) code), with a *t*–statistic of 1.94.

We next examine whether the firms that experienced positive and significant abnormal returns on October 1, 2019 subsequently also saw their ownership base become less institutional-dominated and includes more retail investors. If certain companies are already popular with retail investors and the elimination of trading commissions reduces entry costs for these market participants, it might be reasonable to expect that the retail ownership share at these companies will increase, and the institutional stake decrease, after 2019. We estimate the following regression model for firm *I* in quarter *q* and year *y*:

$$Non - Institutional\ Ownership_{iq} = \alpha Post_q + \gamma AbnormalReturn_i + \beta Post_q \text{x} AbnormalReturn_i + \pi X_{iy} + \delta_i + \theta_y + \varepsilon_{iq} \quad (1)$$

The dependent variable, $Non - Institutional\ Ownership_{iq}$, is the ownership stake of non-institutional investors. Equation (1) uses data between October 1, 2016 and October 1, 2022—three years before and after the abolition of commissions. $Post_q$ is a dummy equaling 1 for the period after October 1, 2019, while $AbnormalReturn_i$ is the firm's abnormal return calculated using the Fama-French model the day commissions were abolished. In some empirical specifications, we will replace $AbnormalReturn_i$ with an indicator for whether the firm's abnormal return on October 1, 2019 was in the sample's top quartile. X_{iy} is a vector of the time-varying firm financials, namely size and profitability. δ_i and θ_y are firm and year fixed effects, whose inclusion allows us to control for firm-specific idiosyncratic factors as well as secular time trends. Note that the inclusion of θ_y does not wash away the main effect of $Post_q$, since 13-F data is reported on a quarterly basis. A firm's non-institutional ownership could thus vary between different quarters within a given year. We cluster the standard errors at the firm level.

Table 4 presents the results from estimating equation (1). Columns (1) and (3) use $AbnormalReturn_i$ (i.e., the actual value of the firm's abnormal return) as the proxy for the reaction

to the abolition of commissions, while columns (2) and (4) use a dummy *Top Quartile CAR*, which equals 1 if the firm's abnormal returns on October 1, 2019 ranked in the top quartile. In all four specifications, regardless of which proxy for abnormal return we use or whether we control for financials, the interaction between *Post* and abnormal returns has a positive and statistically significant coefficient. The baseline result in column (1) implies that a one standard deviation increase in abnormal returns on October 1 corresponds to a subsequent rise in non-institutional ownership of 0.32 percentage points. This rise equals 0.7% (0.74%) of the mean (median) non-institutional ownership in the sample. The baseline result in column (2) implies that a firm's abnormal return on October 1, 2019 belonging in the top quartile leads to a 1.53 percentage point increase in non-institutional ownership. This rise equals 3.32% (3.53%) of the sample mean (median) non-institutional ownership. Therefore, the abolition of trading commissions led to a statistically and economically significant rise in non-institutional ownership in firms most affected by Schwab's announcement on October 1, 2019.

It should be noted that, while the announcement was made on October 1, 2019, the commissions were not actually abolished until a week later. Accordingly, the influx of retail investors would not have occurred until sometime after October 1, 2019. To this extent, our first result suggests expectations by early responders as to how companies that were already popular among retail investors would face an increased demand for their stocks from the expected influx of retail investors, and our second result confirms such expectations.

6. The Governance Effects of Retail Investor Entry

The influx of retail investors into certain companies after the sudden decrease in the cost of entering the stock market had concrete corporate governance implications. In this section, we examine four possible ways in which the rise in retail ownership changed the governance of companies most affected by the 2019 abolition of trading commissions. We look at the change in shareholder non-voting, firm ESG scores, board independence and gender diversity, and quorum requirements.

6.1 Shareholder Non-Voting

The primary corporate governance outcome variable we study is shareholder non-voting. As explained earlier, we measure non-voting at the proposal level, and define it as the percentage of outstanding shares not cast for or against a proposal or marked as abstentions. We estimate the following regression model to assess changes in shareholder-nonvoting for proposal *p* voted on by shareholders of firm *i* in year *y*:

$$Non-Voting_{piy} = \alpha Post_p + \gamma AbnormalReturn_i + \beta Post_p \text{x} AbnormalReturn_i + \pi X_{iy} + \delta_i + \theta_y + \varepsilon_{piy} \quad (2)$$

The variables on the right-hand side of the equation have the same definitions as explained earlier in equation (1). Once again, we cluster standard errors at the firm level. Our hypothesis is that the coefficient for the interaction term $Post_p \text{x} AbnormalReturn_i$ will be positive and significantly different from zero. This is because most non-participation in shareholder voting is typically attributed to retail investors. If the firms that experienced the highest abnormal returns on October 1, 2019—i.e., those with the largest values of $AbnormalReturn_i$—saw the greatest subsequent increase in

retail ownership, as shown in Table 4, we should expect them to also see an increase in shareholder non-participation.

Table 5 presents the results from estimating equation (2). Note that, as in equation (1), the inclusion of year fixed effects does not wash away the main effect of $Post_p$, since proposals in the year 2019 may have $Post_p$ equal to 0 or 1 depending on whether the relevant meeting was before or after October 1, 2019. Across all four specifications in Table 5, using either measure of abnormal return and regardless of controlling for firm financials, the coefficient for the interaction between *Post* and abnormal return on October 1, 2019 is positive and significant. This strongly indicates that shareholder non-voting went up for companies that exhibited high abnormal returns in response to the abolition of trading commissions. The baseline specification in column (1) shows that a one standard deviation increase in abnormal returns in response to the Schwab announcement is associated with a subsequent rise in non-voting by 0.35 percentage points, which equals 1.51% (1.82%) of the mean (median) level of non-voting in the regression sample. Column (2) finds that a stock belonging to the top quartile of abnormal returns saw an almost one percentage point rise in non-voting. This equals 4.22% (5.09%) of mean (median) shareholder non-voting in the regression sample.

This finding is consistent with the literature on retail investor voting discussed in Section 2. Because retail investors are much less likely to vote their shares than institutional investors, the influx of retail shareholders (replacing certain institutional investors) had the effect of reducing the overall votes cast.

6.2 ESG Scores

While shareholders traditionally exert influence in corporate law and governance by voting on proposals and director elections (Easterbrook and Fischel 1983), they may also affect governance in other ways. For instance, Brav et al. (2022) find that retail investors are less likely than institutional investors to support ESG proposals. Therefore, the entry of retail investors after 2019 may have led to a deterioration of ESG metrics at the firms most affected by zero-commission trading. We estimate the following regression model for the ESG scores of company *i* whose ESG score is reported in the MSCI data on date *t* in year *y*:

$$ESG_{ity} = \alpha Post_t + \gamma AbnormalReturn_i + \beta Post_t \text{x} AbnormalReturn_i + \pi X_{iy} + \delta_i + \theta_y + \varepsilon_{ity} \quad (3)$$

Table 6 presents the results from estimating equation (3). As explained in section 4, we analyze ESG scores for firms between October 1, 2017 and October 1, 2021: two years before and after Schwab announced it was eliminating trading commissions. The results are consistent with ESG scores deteriorating at firms affected by Schwab's announcement, with the interaction between *Post* and both proxies for abnormal returns bearing a negative and significant coefficient. Column (1) entails that a one standard deviation increase in abnormal returns is associated with a later decrease in ESG score equal to 1.27% (1.32%) of the mean (median) ESG rating in the regression sample. In column (2), firms with abnormal returns in the top quartile saw a subsequent fall in ESG equal to 2.8% (2.92%) of the mean (median) sample value. This is consistent with Brav et al. (2022)'s contention that retail investors are less likely to support ESG proposals.

Our finding of the deterioration in ESG scores is consistent with an increase in the (relative) influence of retail investors, who typically exert less pressure on corporations to enact prosocial policies than institutional players (Brav et al. 2022, Chen et al. 2020). As the ownership stake of ESG-conscious institutional investors decreased for firms most affected by the 2019 abolition of commissions, these companies may have faced less pressure to behave in a prosocial manner. Consistent with this theory, the ESG scores of treated firms decreased by approximately same proportion that their retail ownership rose.

6.3 Board Independence and Gender Diversity

In recent years, institutional investors have made board independence and diversity a central part of their engagements with portfolio companies (Aggarwal, Litov, and Rajgopal 2023). Institutional ownership is associated with a higher share of both independent and female directors (Appel et al. 2016, Gormley et al. 2023). Therefore, if firms that were most affected by the abolition of trading commissions saw a rise in retail ownership and decrease in institutional holdings, one may expect their board of directors to become less independent or gender-diverse. We estimate the following regression model to assess changes in the firm-year level of board independence and gender diversity:

$$BoardOutcome_{iy} = \alpha Post_y + \gamma AbnormalReturn_i + \beta Post_y \text{x} AbnormalReturn_i + \pi X_{iy} + \delta_i + \theta_y + \varepsilon_{iy} \quad (4)$$

The outcome variable, $BoardOutcome_{iy}$, equals the percentage of firm *i*'s directors in year *y* who are independent or female, depending on the empirical model.

Table 7 presents the results from estimating equation (4). Panel A uses the percentage of independent directors as the outcome variable, while Panel B studies the percentage of female directors. The coefficient for the interaction between *Post* and the proxies for abnormal return is significant for none of the specifications in either panel. Therefore, we do not find evidence suggesting that companies that reacted most positively to Schwab's announcement on October 1, 2019 later significantly changed their approach to board independence or gender-diversity. This null finding contrasts with the finance literature documenting a positive relationship between institutional ownership and the proportions of independent and female directors (Appel et al. 2016, Gormley et al. 2023).

6.4 Quorum Requirements

If retail shareholders' participation in voting is very low, for companies that have experienced a significant influx of retail investors, this could also have an implication for them in conducting shareholder meeting, such as satisfying quorum, electing directors, and passing proposals. In fact, while discussing the recent impact of retail investors with corporate governance practitioners, we were told that some firms had faced issues meeting the quorum in shareholder meetings due to retail holders' non-participation in voting. The practitioners stated that these difficulties had led companies to amend their bylaws and decrease the percentage of outstanding votes that could constitute a meeting quorum. State corporate laws (most importantly Delaware corporate law) allow directors to unilaterally amend bylaws (subject to a small number of exceptions) when such a right is granted to

them in the charter and, as far as we are aware, all public companies have such a provision in the charter.[10]

As explained in section 4, we hand-collected information about both increases and decreases in the quorum requirements from the SEC's EDGAR system. Figure 1 depicts the number of such changes in quorum requirements from October 1, 2016 to October 1, 2022. Panel A shows there has been an explosion in the number of firms making their quorum requirements laxer by decreasing the percentage of outstanding shares that constitute a quorum. While the number of quorum decreases numbered fewer than ten in the years before the abolition of trading commissions, they significantly rose after 2019. For instance, almost eighty firms decreased their quorum requirement in the period between October 1, 2021 and October 1, 2022. By far the most typical change companies made was to decrease the quorum requirement from 50% of outstanding shares to 33.33% (i.e., a third) of outstanding shares.[11] Panel B looks at the number of firms that increased their quorum requirements, making it harder for firms to meet the requirement by raising the required percentage of outstanding shares in attendance at meetings. Overall, there is no similar jump in the number of companies increasing their quorum requirements. While there is a slight increase in the number of firms making such amendments between October 1, 2020 and October 1, 2021, this number decreased the next year and never exceeds 20 during the sample period. Therefore, overall, the advent of zero-commission trading has led to a rise in firms decreasing their quorum requirements.

To more formally analyze a firm's decision to change its quorum requirements, we estimate the following linear probability model for firm *i*'s decision, in industry *j*, to enact a relevant bylaw amendment in year *y*:

$$QuorumChange_{ijy} = \alpha Post_y + \gamma AbnormalReturn_i + \beta Post_y \text{x} AbnormalReturn_i + \pi X_{iy} + \delta_j + \theta_y + \varepsilon_{ijy} \quad (5)$$

$QuorumChange_{ijy}$ is a dummy that equals 1 if the firm increased or decreased quorum requirements in a given year, depending on the model. Note that we now include fixed effects at the *industry* level (as defined by the two-digit SIC code), rather than firm level, because the outcome is the decision to amend corporate bylaws—a decision a firm is only likely to make once in the sample period. We cluster the standard errors at the industry level.

Table 8 shows the results from estimating equation (5). Panel A uses decreases in quorum requirements as the outcome variable, while Panel B uses increases. The interaction between *Post* and abnormal returns in Panel A has a positive and significant coefficient in all specifications. Therefore, firms that showed larger abnormal returns in response to Schwab's 2019 announcement are more likely to loosen quorum requirements, presumably to counteract the problem of retail non-participation in meetings. The results in Panel B are consistent with this story. Here, other than column (1)'s baseline using the actual value of abnormal returns, the interaction between *Post* and abnormal

[10] See Delaware General Corporation Law section 109. See Choi and Min (2018) for unilateral bylaw amendments more generally.

[11] See, for example, https://www.sec.gov/Archives/edgar/data/27093/000149315218015155/0001493152-18-015155-index.htm (changing the bylaws to " reduce the quorum requirement for shareholder meetings from shareholders representing a majority of the shares entitled to vote to the minimum required by Nasdaq Stock Market Rule 5620(c) of one-third (33-1/3%) of the issued shares of the Corporation's common voting stock").

return has a *negative* and significant coefficient. Thus, firms that were most affected by the advent of commission-free trading are less likely to make their quorum requirements more stringent in the years after October 1, 2019.

Overall, the findings in Table 8 are consistent with practitioner accounts stating that firms to which retail investors were attracted faced difficulties in subsequently getting meeting quorum requirements at shareholder meetings. This is consistent with our model's finding from Section 3. In response, it seems these firms became more likely to pass bylaw amendments decreasing the percentage of outstanding shares that would constitute a quorum.

7 Robustness Tests

In this section, we present the results of various robustness tests we have conducted. We first show that there was no (statistically significant) pretend in either institutional ownership or vote participation prior to October 1, 2019. To address possible selection effects (and biased sample), we have also conducted both matched sample and entropy-balanced regressions. Finally, in addition to zero commission trading, in 2019, some brokerages also introduced fractional trading, which presumably made it easier for retail investors to participate in stock trading. We examine whether the introduction of fractional trading could have affected the results.

7.1 Pretrend Analysis

A central contention of this paper is that the reduction in retail investors' entry costs due to the introduction of zero-commission trading led to an increase in non-institutional ownership for firms that saw the largest abnormal returns in response to Schwab's 2019 announcement. However, one potential concern with this claim is that these firms may have been gaining retail owners in preceding years as well, with the observed change having little to do with zero-commission trading. This concern is somewhat reinforced by the results in Table 3, which showed that the firms exhibiting the greatest abnormal returns on October 1, 2019 already had larger non-institutional ownership.

To address this concern, we estimate a dynamic version of equation (1)—which examines changes in non-institutional changes—replacing $Post_q$ with a series of dummy variables for the individual years around the abolition of trading commissions. We denote T as the period between October 1, 2019 and October 1, 2020; i.e., the year immediately after the introduction of zero-commission trading. Following Gopalan et al. (2021), we set the year preceding the treatment (T–1) as the base year. Figure 2 presents the results of this dynamic model, displaying the 95% coefficients for the interaction between abnormal returns and the year dummies. We find no evidence of a pretrend in non-institutional ownership for the treatment group in the years preceding the introduction of zero-commission trading. Figure 3 presents the results of an analogous dynamic version of equation (2), where we look at possible pretrends in the level of shareholder non-voting. Once again, we find no evidence that the treatment group (firms with greater abnormal returns on October 1, 2019) were already seeing greater non-voting in the period before major online brokerages eliminated trading commissions.

7.2 Matched Sample Regressions

We next examine the concern that firms that experienced positive abnormal returns may be fundamentally different from other companies. Under such a theory, these companies may have gained non-institutional owners after 2019 not because of zero-commission trading, but because of other observable factors such as greater profitability. To account for this possibility, we re-run equation (1) on a matched sample. We match every firm whose abnormal returns on October 1, 2019 to another firm based on size and return on assets. Table 9 presents the results for this matched sample analysis, comparing firms inside and outside the top quartile of abnormal returns. Once again, the interaction between *Post* and the dummy for the firm's abnormal returns belonging to the top quartile are positive and significant, irrespective of whether we control for financials. Therefore, the results are unlikely to be driven by fundamental differences between firms based on whether they were in the top quartile of abnormal returns on October 1, 2019.

7.3 Entropy-Balanced Regressions

To further ensure that the observed changes in non-institutional ownership are not driven by fundamental financial differences between firms within and outside the top quartile of abnormal returns on October 1, 2019, we re-run equation (1) using the entropy balancing matching methodology introduced by Hainmueller (2012). Entropy-balancing, which has subsequently been used by papers such as Heimer and Simsek (2019) and Jacob et al. (2019), involves balancing the first three moments of the covariates for treated companies (those in the top quartile of abnormal returns) and others. Table 10 validates that the basic result—that firms with greater abnormal returns on October 1, 2019 subsequently increased their levels of non-institutional ownership—persists in the entropy-balanced sample.

7.4 Placebo Event Studies: Fractional Trading

We address the possibility that the driving force behind the entry of retail investors was not the October 1, 2019 abolition of trading commissions, but instead was the introduction of fractional trading. Fractional trading allows investors to purchase a fraction of a company's shares, rather than having to purchase stock in whole units. Previous research has shown that fractional trading has led to an upsurge in interest in "meme stocks" popular with retail investors as well as companies that are household names, such as Apple and Disney (Bartlett et al. 2022). Therefore, an alternative explanation for our results is that the recent rise in retail ownership is driven by fractional trading rather than the elimination of trading costs.

We do not find this explanation plausible, in part because of the timing of the major online brokerages introducing fractional trading. Charles Schwab became the first major online brokerage to introduce fractional trading, announcing that it would let customers purchase a fraction of shares on October 17, 2019. However, even when Schwab announced the introduction of fractional trading, media coverage linked this development to its elimination of trading commissions a few weeks earlier on October 1, 2019. An investment manager told the media that he viewed Schwab's introduction of fractional trading as being "complementary with the commission cut as it removes any remaining friction around single stock trading."[12] Thus, the introduction of fractional trading should be seen as

[12] See https://www.cnbc.com/2019/10/17/the-latest-in-the-brokerage-wars-charles-schwab-will-allow-people-to-buy-fractions-of-stocks.html.

a continuation of the reduction in entry costs for retail investors that began on October 1 with commission-free trading rather than an independent source of the corporate governance changes documented in this paper.

Nevertheless, we re-run the event study analysis in Table 3, alternately using as dependent variable the Fama-French abnormal returns for the introduction of fractional trading by Schwab (on October 17, 2019), and by the next broker to allow fractional share purchases (Interactive Brokers, on November 25, 2019).[13] Table 11 presents the results of these placebo event studies, where we again regress the abnormal return against non-institutional ownership as of September 30, 2019. In none of the specifications is the coefficient for non-institutional ownership positive and significant. In fact, in the baseline model in column (1), where the dependent variable is the abnormal return the day Schwab announced it was introducing fractional trading, non-institutional ownership has a negative and significant coefficient. However, the coefficient for non-institutional ownership becomes statistically insignificant at traditional levels for all four specifications in Table 11 when we cluster standard errors at the two-digit SIC level. Therefore, the institutional background of fractional trading being an adjunct or follow-on development to the elimination of trading commissions and the null results from Table 11's placebo event study indicates that our results are unlikely to be driven by investors' newfound ability to purchase fractions of shares.

8. Conclusion

What is the impact of a shareholder base on corporate governance? This paper has attempted to answer this important question by looking at the influx of retail investors into shareholder base due to a wide introduction of zero-commission trading. While the earlier research has attempted to answer this question by examining the issue from the "opposite" direction, e.g., an (exogenous) increase in institutional ownership, we add to the existing scholarship by looking more directly at retail investor behavior. As shown earlier, if retail shareholders' participation rate (on governance issues) is relatively small, at least in theory, it is unclear whether the remaining (passive) institutional owners' influence over governance gets stronger when other (more active) institutional shareholders exit. This is in contrast to a situation where (passive) institutional shareholders increase their ownership, in which case, their influence will increase. This paper has tried to resolve this uncertainty by looking several different governance measures, including vote participation rates, board independence and diversity measures, and ESG scores. The paper has shown that over various metrics, corporate governance suffers as retail ownership increases. Specifically, this paper has shown that that an increase in retail investor participation in the capital markets may have brought about less ESG-friendly corporate behavior among those firms popular with retail investors. This is likely due to retail shareholders' lack of interest and participation. We also show that, firms, aware of retail investors' low participation, directly respond by lowering their quorums in holding shareholder meetings.

While the research on the impact of shareholder base on corporate governance remains active, several challenges and questions remain. The first is to examine investors' behavior more directly. Like earlier research, we have relied on outcome and indirect measures, due largely to data limitations. But, more research regarding how different types of investors actually participate in shareholder franchise remains on the research agenda. The question invokes not only the difference between institutional versus retail shareholders but also distinguishing among various institutional investors, such as passive

[13] See https://www.wealthmanagement.com/technology/interactive-brokers-rolls-out-fractional-trading.

mutual funds, active hedge funds, pension funds, and retail investors. Furthermore, due to the popularity of zero-commission trading platform, we have seen an increase in stock market participation by retail investors, but we are yet to observe any increase in participation in shareholder franchise. Given that the seeming popularity of zero commission trading through mobile phone apps has been relatively recent and more innovation is taking place, allowing, for instance, retail investors to access proxy materials and cast their votes on mobile phones, it may be likely that the retail investors' behavior regarding casting votes can change in the near future.

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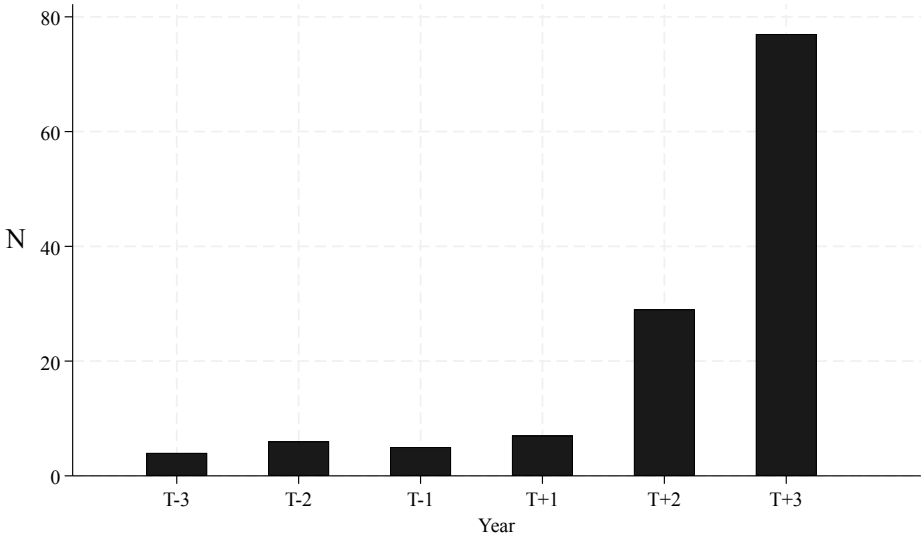
Figure 1

Changes in Quorum Requirements, 2016-2022

Panel A graphs the number of firms decreasing the percentage of shares comprising a quorum for shareholder meetings, while Panel B depicts the number of companies increasing the percentage of shares required for a quorum. "T" refers to October 1, 2019. "T-1" demarks the period 10/1/2018–10/1/2019; "T+1" refers to 10/1/2019–10/1/2020, and so on.

Panel A. Decreases in Quorum Requirements



Panel B. Increases in Quorum Requirements

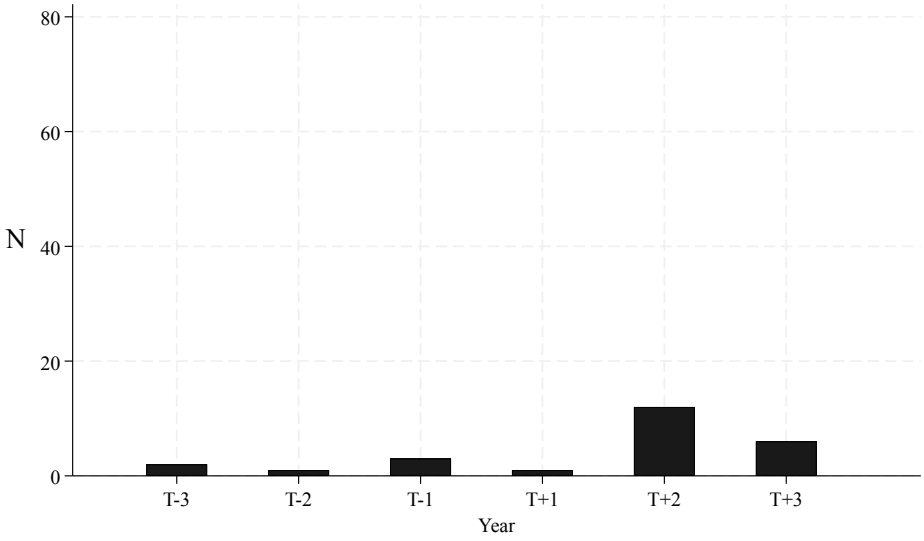


Figure 2

Testing for Pretrends: Changes in Non-Institutional Ownership

This figure shows the 95% coefficients for the interaction between year dummies and firm abnormal returns on October 1, 2019, in a fully saturated model where the dependent variable is the fraction of non-institutional ownership, as derived from 13-F filings. We use year T-1 as the baseline. Year T represents the period between October 1, 2019 and October 1, 2020.

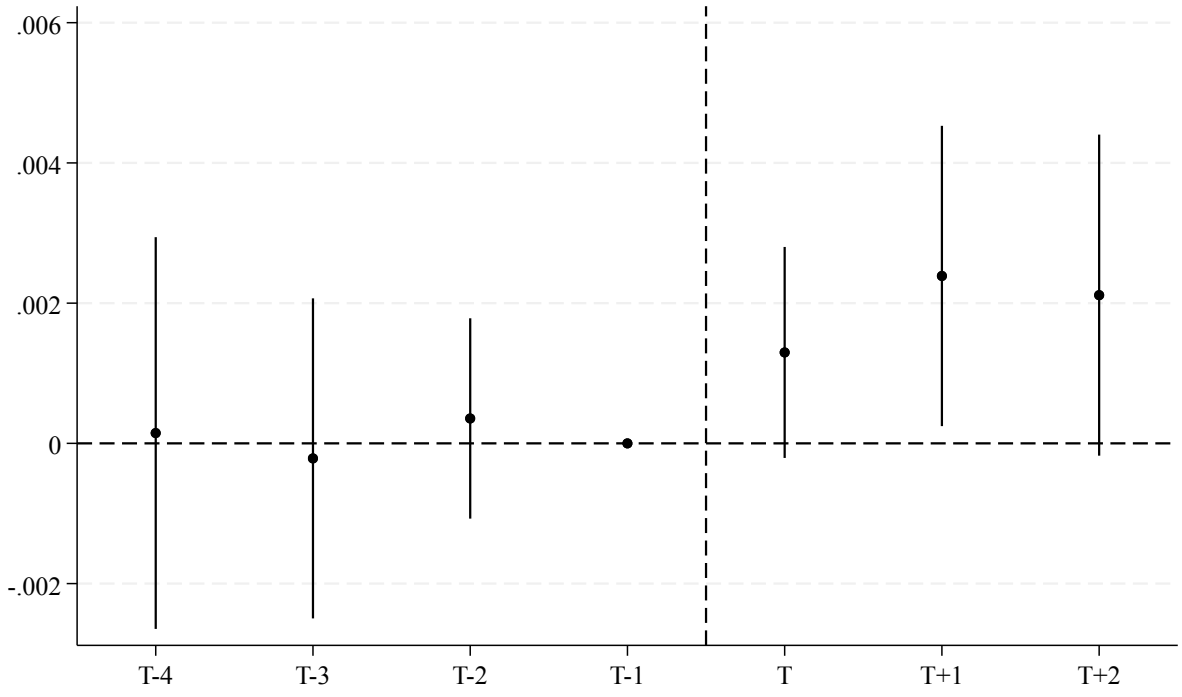


Figure 3

Testing for Pretrends: Changes in Shareholder Non-Voting

This figure shows the 95% coefficients for the interaction between year dummies and firm abnormal returns on October 1, 2019, in a fully saturated model where the dependent variable is the percentage of shareholder non-votes, at the proposal level. We use year T-1 as the baseline. Year T represents the period between October 1, 2019 and October 1, 2020.

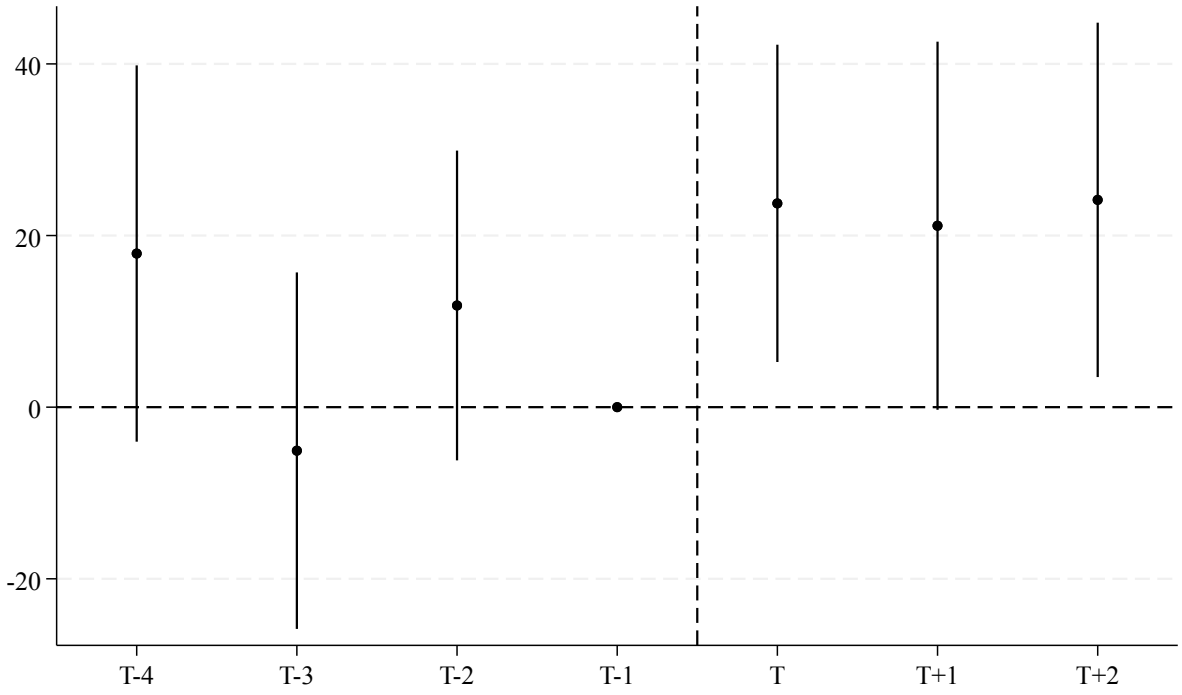


Table 1

Variable Definitions

Variable	Definition	Source
Board Gender Diversity	The percentage of directors at the firm-year level who are women.	BoardEx
Board Independence	The percentage of directors at the firm-year level who are classified as independent.	BoardEx
CAR	The abnormal return experienced by the firm on October 1, 2019, using the Fama-French three factor model, winsorized at the 1% level.	WRDS, manual checks
Decrease in Quorum Requirement	An indicator equaling 1 if the company reduced the percentage of outstanding shares that comprise a quorum for stockholder meetings.	Hand coding
ESG Score	A firm's industry-adjusted composite ESG score.	MSCI
Increase in Quorum Requirement	An indicator equaling 1 if the company increased the percentage of outstanding shares that comprise a quorum for stockholder meetings.	Hand coding
Ln(Assets)	The natural logarithm of the firm's total assets, winsorized at the 1% level.	Compustat
Non-Institutional Ownership	One minus the fraction of total institutional ownership reported in 13-F filings, winsorized at the 1% level.	Thomson Reuters
Percentage of Female Directors	Percentage of directors, at the firm-year level, classified as female.	BoardEx
Percentage of Independent Directors	Percentage of directors, at the firm-year level, classified as independent.	BoardEx
Post-Abolition	An indicator equal to 1 after the October 1, 2019 abolition of trading commissions by major online brokerages.	Manual checks
Shareholder Non-Voting	The percentage of outstanding shares, at the proposal level, that were not cast for or against a proposal, or abstained, winsorized at the 1% level.	ISS
Top Quartile CAR	An indicator equaling 1 if the firm's abnormal return (computed using the Fama-French three-factor model) on October 1, 2019 was in the top quartile of the given sample.	WRDS, manual checks
Return on Assets	A firm's net income divided by total assets, winsorized at the 1% level.	Compustat

Table 2

Summary Statistics

Panel A presents summary statistics for different samples used in the empirical analysis. Panel B compares non-institutional ownership and financial variables for firms with above- and below-median abnormal returns on October 1, 2019 in the event study sample. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

Panel A. Overall Summary Statistics

Event Study Sample

	N	Mean	SD
Non-Institutional Ownership	6824	.441	0.316
CAR	6826	-.099	1.778
Ln(Assets)	4545	7.563	2.202
Return on Assets	3838	-.039	0.217

13-F Sample

	N	Mean	SD
Non-Institutional Ownership	170401	.46	0.295
CAR	170401	-.093	1.723
Top Quartile CAR	170401	.25	0.433
Ln(Assets)	118278	7.634	2.242
Return on Assets	98351	-.019	0.195

Proposal-Level Sample

	N	Mean	SD
Percentage Non-Votes	254822	23.379	15.538
CAR	254822	-.001	0.018
Top Quartile CAR	254822	.25	0.433
Ln(Assets)	247481	8.099	2.166
Return on Assets	200504	-.004	0.170

Panel B. Differences between Firms based on Abnormal Return on October 1, 2019

	Above-Median CAR (1)	Below-Median CAR (2)	Difference (1)–(2)
Non-Institutional Ownership	0.468	0.415	6.916***
Ln(Assets)	7.548	7.577	–0.432
Return on Assets	–0.026	–0.05	3.417***
Cash Ratio	0.113	0.124	–2.129**
Debt Ratio	0.304	0.283	2.503**

Table 3

Event Study Analysis

This table presents the results of a linear regression model where the dependent variable is the abnormal return for each firm on October 1, 2019, when major brokerages announced they would abolish trading commissions. We use the Fama-French three-factor asset pricing model to compute abnormal returns. Non-Institutional ownership is measured as 1 minus the fraction of institutional ownership as reported in 13-F data as of September 30, 2019. All standard errors are robust, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	(1) Baseline	(2) With Financials
Non-Institutional	0.207***	0.276**
Ownership	(2.722)	(2.207)
Ln(Assets)		0.0286
		(1.640)
Return on Assets		1.034***
		(3.802)
Observations	6,824	3,838
R-squared	0.001	0.012

Table 4

Changes in Non-Institutional Ownership

This table presents the results of a linear regression model where the dependent variable is the share of non-institutional ownership, based on 13-F data. All models use data from fiscal years 2016 to 2022, and *Post-Abolition* equals 1 for reporting dates after October 1, 2019. All models include firm and year fixed effects. All standard errors are robust and clustered at the firm level, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
	Baseline		With Financials	
Post-Abolition	-0.00538***	-0.00933***	-0.00644***	-0.0106***
	(-5.110)	(-6.831)	(-5.669)	(-6.731)
CAR *x* Post-Abolition	0.00187*		0.00209**	
	(1.897)		(2.299)	
Top Quartile CAR *x*		0.0153***		0.0116***
Post-Abolition		(4.461)		(3.272)
Ln(Assets)			-0.0793***	-0.0793***
			(-17.64)	(-17.64)
Return on Assets			-0.00370	-0.00430
			(-0.437)	(-0.508)
Observations	134,618	134,618	76,307	76,307
R-squared	0.898	0.898	0.941	0.941
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Table 5

Changes in Shareholder Non-Voting

This table presents the results of a linear regression model where the dependent variable is the percentage of shareholder votes not cast for or against a proposal or marked as abstentions. All models use proposal-level data from fiscal years 2016 to 2022, and *Post-Abolition* equals 1 for reporting dates after October 1, 2019. All models include firm and year fixed effects. All standard errors are robust and clustered at the firm level, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
	Baseline		With Financials	
Post-Abolition	0.601	0.302	1.187*	0.804
	(0.907)	(0.459)	(1.787)	(1.218)
CAR *x* Post-Abolition	19.16**		19.78**	
	(2.079)		(2.223)	
Top Quartile CAR *x*		0.986***		1.234***
Post-Abolition		(2.934)		(3.714)
Ln(Assets)			-1.926***	-1.933***
			(-5.101)	(-5.142)
Return on Assets			-0.707	-0.786
			(-0.758)	(-0.844)
Observations	198,017	198,017	155,458	155,458
R-squared	0.663	0.663	0.695	0.695
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Table 6

Changes in ESG Scores

This table presents the results of a linear regression model where the dependent variable is the firm's industry-adjusted ESG score as reported by MSCI. All models use data between October 1st, 2017 and October 1st, 2021, and *Post-Abolition* equals 1 for the period after October 1st, 2019. All models include firm and year fixed effects. All standard errors are robust and clustered at the firm level, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
	Baseline		With Financials	
Post-Abolition	-0.0712**	-0.0433	-0.0842**	-0.0613
	(-1.998)	(-1.270)	(-2.145)	(-1.610)
CAR *x* Post-Abolition	-3.403***		-3.076**	
	(-2.805)		(-2.472)	
Top Quartile CAR *x*		-0.115**		-0.0980*
Post-Abolition		(-2.241)		(-1.814)
Ln(Assets)			0.154**	0.205***
			(2.287)	(3.388)
Return on Assets			-0.218	-0.247
			(-1.143)	(-1.566)
Observations	6,528	8,005	5,767	6,837
R-squared	0.893	0.904	0.895	0.904
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Table 7

Changes in Board Independence and Gender Diversity

This table presents the results of a linear regression model where the dependent variable is the percentage of independent directors in Panel A and the percentage of female directors in Panel B. All models use board-level data from fiscal years 2016 to 2022, and *Post-Abolition* equals 1 for fiscal years starting 2020. All models include firm and year fixed effects. All standard errors are robust and clustered at the firm level, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

Panel A. Percentage of Independent Directors

	(1)	(2)	(3)	(4)
	Baseline		With Financials	
CAR *x* Post-Abolition	2.341		5.044	
	(0.346)		(0.728)	
Top Quartile CAR *x*		-0.175		-0.0826
Post-Abolition		(-0.572)		(-0.253)
Ln(Assets)			0.332	0.619**
			(1.202)	(2.491)
Return on Assets			0.248	-0.0893
			(0.484)	(-0.218)
Observations	19,119	23,923	16,515	20,937
R-squared	0.828	0.825	0.832	0.830
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Panel B. Percentage of Female Directors

	(1)	(2)	(3)	(4)
	Baseline		With Financials	
CAR *x* Post-Abolition	-3.651		-3.373	
	(-1.021)		(-0.904)	
Top Quartile CAR *x*		0.106		0.0725
Post-Abolition		(0.653)		(0.416)
Ln(Assets)			-0.0537	-0.00817
			(-0.389)	(-0.0715)
Return on Assets			-0.0927	-0.102
			(-0.333)	(-0.456)
Observations	19,119	23,923	16,515	20,937
R-squared	0.233	0.269	0.248	0.283
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Table 8

Changes in Quorum Requirements

This table presents the results of a linear probability model where the dependent variable is an indicator variable equaling 1 if the firm decreased (increased) quorum requirements for shareholder meetings in Panel A (Panel B). All models use board-level data from fiscal years 2016 to 2022, and *Post-Abolition* equals 1 for fiscal years starting 2020. All models include industry and year fixed effects. All standard errors are robust and clustered at the industry level, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

Panel A. Decrease in Quorum Requirements

	(1) Baseline	(2) With Firm Financials	(3) Baseline	(4) With Firm Financials
CAR	0.009	0.012		
	(1.051)	(1.246)		
CAR *x* Post-Abolition	0.041**	0.046**		
	(2.401)	(2.483)		
Top Quartile CAR			0.000	0.000
			(0.451)	(0.397)
Top Quartile CAR *x*			0.001*	0.001*
Post-Abolition			(1.754)	(1.705)
Ln(Assets)		-0.000***		-0.000***
		(-2.992)		(-3.096)
Return on Assets		-0.003		-0.003
		(-1.609)		(-1.550)
Observations	45,561	26,087	45,561	26,087
R-squared	0.003	0.004	0.002	0.004
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Panel B. Increase in Quorum Requirements

	(1) Baseline	(2) With Firm Financials	(3) Baseline	(4) With Firm Financials
CAR	0.002*	0.002*		
	(1.940)	(1.725)		
CAR *x* Post-Abolition	-0.012	-0.019**		
	(-1.194)	(-2.113)		
Top Quartile CAR			0.000	0.000
			(1.388)	(0.977)
Top Quartile CAR *x*			-0.001*	-0.001**
Post-Abolition			(-1.817)	(-2.317)
Ln(Assets)		-0.000		-0.000
		(-0.471)		(-0.557)
Return on Assets		0.000		0.000
		(0.254)		(0.253)
Observations	45,561	26,087	45,561	26,087
R-squared	0.001	0.001	0.001	0.001
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Table 9

Change in Non-Institutional Ownership: Matched Sample Analysis

This table presents the results of a linear regression model where the dependent variable is the share of non-institutional ownership, based on 13-F data. We run these equations on a matched sample, where we match firms in the top quartile of abnormal returns on October 1, 2019 to other companies by size and profitability. All models use data from fiscal years 2016 to 2022, and *Post-Abolition* equals 1 for reporting dates after October 1, 2019. All models include firm and year fixed effects. All standard errors are robust and clustered at the firm level, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	(1) Baseline	(2) With Financials
Post-Abolition	-0.0233***	-0.0225***
	(-4.685)	(-4.540)
Top Quartile CAR *x*	0.0195***	0.0155***
Post-Abolition	(3.806)	(3.191)
Ln(Assets)		-0.0799***
		(-13.17)
Return on Assets		0.00580
		(0.483)
Observations	58,121	49,373
R-squared	0.941	0.952
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Table 10

Change in Non-Institutional Ownership: Entropy-Balanced Analysis

This table presents the results of a linear regression model where the dependent variable is the share of non-institutional ownership, based on 13-F data. We run these equations on an entropy-balanced sample, where we balance the first three moments of covariates for firms in the top quartile of abnormal returns on October 1, 2019 and other companies. All models use data from fiscal years 2016 to 2022, and *Post-Abolition* equals 1 for reporting dates after October 1, 2019. All models include firm fixed effects. All standard errors are robust and clustered at the firm level, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	(1) Baseline	(2) With Financials
Post-Abolition	-0.0137***	-0.0127***
	(-6.471)	(-6.318)
Top Quartile CAR *x*	0.0151***	0.0131***
Post-Abolition	(3.905)	(3.615)
Ln(Assets)		-0.0795***
		(-16.47)
Return on Assets		-0.00441
		(-0.488)
Observations	76,307	76,307
R-squared	0.935	0.940
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Table 11

Placebo Event Studies

This table presents the results of a linear regression model where the dependent variable in columns (1) and (2) is the abnormal return for each firm on October 17, 2019, when Charles Schwab announced it was introducing fractional trading ("FT"). The dependent variable in columns (3) and (4) is the abnormal return on November 25, when Interactive Brokers announced the advent of fractional trading. We use the Fama-French three-factor asset pricing model to compute abnormal returns. Non-Institutional ownership is measured as 1 minus the fraction of institutional ownership as reported in 13-F data as of September 30, 2019. All standard errors are robust, and t-statistics are presented in parentheses. All variables are described in Table 1. The ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
	Schwab FT Announcement		Interactive Brokers FT Announcement	
	Baseline	With Financials	Baseline	With Financials
Non-Institutional	-0.140**	-0.111	-0.0684	0.0616
Ownership	(-1.988)	(-0.960)	(-0.878)	(0.473)
Ln(Assets)		0.0424***		-0.0243
		(2.627)		(-1.362)
Return on Assets		0.464*		1.318***
		(1.715)		(4.747)
Observations	6,849	3,850	6,925	3,897
R-squared	0.001	0.007	0.000	0.013

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