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Finance Working Paper N° 763/2021
January 2025

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Keywords: Exchange-Traded Funds, Proxy Voting, Broker Non-Vote, Short Interest, Operational Shorting, Authorized Participants, ETF Market Making, Voting of Hedged Positions, Empty Voting

JEL Classifications: G11, G12, G14, G23, G34

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Phantom of the Opera: ETF Shorting and Shareholder Voting

With the dramatic increase in passively invested assets across the globe, index funds and exchange-traded funds (ETFs) play an increasingly important role in corporate governance (Bebchuk and Hirst (2019), and Kahan and Rock (2020)). To this end, there is a growing academic literature on the contrasting governance effects of passive investors. On the one hand, as opposed to active managers, for whom exit is a governance strategy, passive investors must rely on voice – the exercise of voting rights – to take an active role in governance (Hirschman (1970), Yermack (2010), Brav, Jiang, and Li (2021), and Bolton, Ravina, and Rosenthal (2020)). Hence, the institutional attention associated with passive ownership may enhance governance in the firm (e.g., Appel, Gormley, and Keim (2016), Fisch, Hamdani, and Solomon (2019), Lewellen and Lewellen (2022), and Gormley et al. (2023)). On the other hand, the implicit trust of the market's price for a given security and the inherent cost minimization approach may result in a one-size-fits-all, and a pro-management approach to governance (e.g., Bebchuk, Cohen, and Hirst (2017), Lund (2018), and Heath et al. (2022)).

While the debate regarding the efficacy of voting decisions by passive funds is in its early stages, our paper addresses a more foundational issue: whether the shares of stocks underlying the ETFs are voted at all. To be clear, our evidence does not suggest that ETF sponsors (e.g., BlackRock, State Street, Vanguard) do not vote the underlying firm shares owned by their ETFs (see Fenn and Robinson (2009) for analysis of proxy voting by ETFs). Instead, as a presumably unintended consequence of ETF security design, we show that for a subset of ETF shares, the underlying shares of the firm's stock backing this subset are sidelined from the voting process. These shares are not held and voted by the ETF sponsor, but instead they are held by the authorized participant or market maker/arbitrageur (hereafter, AP/arbitrageur) for hedging purposes. Because the shares are held as part of a hedge, the AP/arbitrageur is not a true beneficial owner of the security and, therefore, abstains from proxy voting. This abstention effectively decouples the cash flow rights from the voting rights of the corresponding ETF share. We refer to these as "*phantom ETF shares*" and the corresponding underlying securities as simply "*phantom shares*". We

demonstrate that such phantom shares are associated with decreased voting of the underlying shares, and we examine the implications on the firm governance of this decrease in votes cast at shareholder meetings.

To better understand the origin of phantom ETF shares, consider the governance implications of three different investments depicted in Figure 1, based on our overall sample findings: (i) purchasing the individual stocks belonging to the S&P 500 index, (ii) investing an S&P 500 index mutual fund, and (iii) purchasing an S&P 500 ETF. For an investor who purchases the 500 underlying securities of the S&P 500 in the appropriate weights, each $1 invested generates $1 of proportionate voting rights in those securities, where the investor would make the voting decisions. For an S&P 500 index mutual fund investment, each $1 invested generates $0.98 of proportionate voting rights where the investment advisor chooses how each proxy item is voted. The loss of $0.02 in voting rights relative to the individual stock example is due to the 2% cash holding for the average fund in our sample to accommodate daily redemptions. For an investor purchasing S&P 500 ETF, we find that each $1 invested generates only $0.84, on average, in voting rights in the underlying securities in our sample.

What causes this striking difference between the voting rights associated with index funds and ETFs? Despite the many similarities between the two products, the biggest difference is the nature of liquidity provision. While index funds can only be purchased directly from an investment advisor as part of a 'long sale', ETF shares are purchased on the secondary market as part of both long sales (86% of value-weighted transactions) and short sales (14%). The importance of this distinction is that an ETF share purchased as part of a long sale is backed by underlying securities that are voted by the ETF sponsor. In contrast, if an ETF is sold short by APs/arbitrageurs and shares of the underlying securities are held long to hedge (as a typical liquidity provision practice for APs and/or a common arbitrage trade), the holders of those shares will abstain from voting them (see Appendix C for details regarding the European Securities and Market Authority's (ESMA) questionnaire indicating that institutional market participants refrain from voting securities held as a hedge). This behavior reflects the market participants' desire to avoid both the appearance of and the regulatory and liability concerns related to "empty voting": voting the shares without corresponding economic exposure which has been eliminated by the joint long underlying and short ETF

position.[1] Hence, while the ETF shares purchased via a long sale have the same cash flow and voting rights as an index mutual fund, for the ETF shares that are sold short by APs/arbitrageurs, the underlying securities held to hedge those positions tend to be sidelined in the voting process. The hedging mechanism, combined with a 2% cash position underlying the ETF long-sale portfolio, generates $0.84 in voting rights relative to the $1 invested in common stock.[2]

The focus of this paper is to examine the impact of phantom ETF shares on corporate proxy voting. As investors increasingly invest in equities through ETFs, the sidelining of the underlying securities used as a hedge (i.e., either in the course of ETF liquidity provision or as part of an arbitrage trade) has the potential to distort the voting process in public firms. To address this issue, we first construct a measure of phantom ETF shares using ETF short interest data. Then, we translate this measure of phantom ETF shares to phantom shares using ETF portfolio holdings data. With this measure of phantom ownership of the underlying securities in hand, we examine the impact on corporate voting outcomes on a sample of voting records from 6,556 different U.S. public companies by 1,150 ETFs over 2004-2018. On average, phantom shares are 14% of total ETF ownership (outstanding ETF shares *plus* phantom ETF shares) of underlying shares in our sample (0.6% out of 4.1%). Focusing on small-cap firms such as those in the Russell 2000, the percentage of phantom shares rises to 21% of total ETF ownership of underlying shares (0.9% out of 4.2%).

[1] Prior research has documented cases of hedged positions resulting in empty voting and the potential for regulatory and judicial enforcement actions due to the associated "risk decoupling" (e.g., Hu and Black (2006), Katz (2006), and Lee (2007)). Additionally, the responses to the ESMA questionnaire focused on uncovering potential "empty voting" issues make clear that institutional market participants are keenly aware of empty voting concerns and have enacted policies to eliminate them. Finally, there is anecdotal evidence that some corporations have even enacted bylaw changes to preclude such voting. Specifically, these bylaws require the disclosure of any hedging activities by common share owners who file shareholder proposals. See, for example, Sara Lee Corporation (https://www.sec.gov/Archives/edgar/data/0000023666/000129993308001659/htm_26377.htm) and Coach Inc. (https://www.sec.gov/Archives/edgar/data/1116132/0001157523-08-001365.txt).

[2] This estimate is derived from the long and short sale percentages of ETFs and the corresponding loss in voting rights illustrated in Figure 1. For this estimate, we assume the hedge to be comprised of the underlying stock. Specifically, $0.84 is the proportionate voting rights in the investment of $1, 86% × 98% + 14% × 0%.

The distribution of phantom shares is positively skewed.[3] Considering more broadly the full sample of investable securities, more than a third of the stocks in the Russell 3000 have phantom shares greater than 1% of shares outstanding, as shown in Figure 2. Consistent with our notion that phantom ETF shares translate to phantom shares that are not voted, in our baseline analyses, we find that increases in phantom shares around the voting record dates are associated with a decrease in voting, and an increase in broker non-votes for the underlying securities, at the corresponding shareholder meetings. In other words, an increase in phantom shares is effectively associated with an increase in sidelined votes of the underlying.

To ensure our analysis is not driven by potentially endogenous factors, such as a dual trend in ETF ownership and voting patterns over time, we include time fixed effects in our analyses and exploit two regulatory changes that affected uninstructed (or discretionary) broker voting. Before 2010, the Securities and Exchange Commission (SEC) allowed brokers to vote shares "without voting instructions from the beneficial owner" on uncontested elections of directors, which were deemed "routine" matters in shareholder meetings. This rule changed formally on January 1st, 2010, making such election of directors "non-routine", so that brokers would not be able to vote without instructions from the investors (SEC (2009) discusses the rule to eliminate broker discretionary voting for election of directors). Repeating our main test on a sample of only director elections, and accounting for the change in policy, we find a strong positive relationship between phantom shares and broker non-votes, once brokers were no longer allowed discretion in voting such shares. However, before 2010 we find no relationship between phantom shares and broker non-votes, suggesting that brokers widely voted these sidelined shares in director elections. We repeat this test around a similar 2012 rule change that further narrowed the definition of routine matters and find similar results.[4] These findings corroborate the effect of phantom shares on sidelined votes, and address potential

[3] Phantom shares have a standard deviation of 0.62% in our sample. This high standard deviation relative to the mean suggests important heterogeneous variation that manifests itself in the economically significant real effects of phantom shares on corporate voting that we explore later in the paper in Section 3.

[4] The 2012 rule change affected the following corporate governance proposals by deeming them non-routine: de-staggering the board, implementing majority voting in the election of directors, eliminating supermajority voting, use of written consents, rights to call a special meeting, and overriding certain types of anti-takeover provisions (https://www.sec.gov/investor/alerts/votinginannualshareholdersmeetings.pdf).

endogeneity concerns, using a setting with a plausibly exogenous regulatory change.

To better identify the proposed hedging mechanism, we separate the two primary types of ETF shorting activity. The first is "operational shorting," where ETF short interest arises when APs sell ETF shares to secondary market participants before those shares are actually created.[5] As these shares have been sold, but not yet created, the APs effectively short the ETF shares for the purpose of liquidity provision and market making (Evans et al. (2024)), which they then hedge by holding the underlying securities. The second is "directional shorting," where the ETF short interest is the result of ETF shares being borrowed and shorted to speculate or to hedge market or industry exposures when taking a long position in a security.[6]

Using IHS Markit Securities Finance data on the actual ETF shares on loan, we decompose the ETF short interest. We find that, on average, two-thirds of the overall ETF short interest are the result of operational shorting for market-making purposes, and the remaining one-third of overall short interest is attributed to directional shorting. Having divided ETF shorting into these two components, we examine how phantom ETF shares created from both 'operational' and 'directional' short selling relate to broker non-votes, and find compelling evidence that the operational shorting channel is much stronger in explaining the sidelining of the votes. These results further validate that the hedging channel due to ETF liquidity provision/market making is driving the sidelining of proxy votes.

Next, we further examine the conjectured hedging mechanism for our findings by proxying for the

[5] While ETF shares are bought and sold by investors at bid-ask spreads posted by market makers, the supply of ETF shares adjusts due to the actions of APs. ETF sponsors authorize APs to arbitrage the difference in prices between the basket of underlying securities (e.g., the 500 stocks in the S&P 500) and the ETF (e.g., SPY, an ETF tracking the S&P 500). Through this mechanism, the supply of ETF shares is adjusted according to investor demand. To enhance ETF liquidity and exploiting additional trading settlement periods, however, Evans et al. (2024) show that APs are allowed to sell ETF shares that have not yet been created (operational shorting or "naked short selling for bona fide market making" as per Regulation SHO: https://www.sec.gov/investor/pubs/regsho.htm). Similar to the regular short-selling case, these shares can be bought and sold at ETF prices, granting investors economic ownership. However, because the AP has not purchased and delivered the basket of underlying securities to the sponsor, these ETF shares do not have corresponding voting rights exercised by the ETF sponsor.

[6] While SEC regulation 15c3-3 requires the use of cash-like collateral for securities lending by certain market participants, alternative lending access has increased the percentage of U.S. equity loans backed by non-cash collateral. Using internal IHS Markit data, Khemdoudi and Marhefka (2017) document that for directional short selling over much of our sample period the percentage of U.S. equity loans backed by non-cash collateral has increased from 10% to over 40%. For operational short selling, which we find in Section 2.4 to be the main driver of our findings, there is no such regulatory requirement.

'quality' of the hedge. As we find support for the operational shorting channel but not the directional shorting channel, we focus our attention on phantom shares that arise from operational shorting in our subsequent analyses. While an AP/arbitrageur could use the entire basket of underlying to hedge the short ETF position (e.g., all 500 stocks in the S&P 500), it is more plausible that a subset of those securities (e.g., 50 or 100 of the 500 stocks in the S&P 500) with the most similar collective risk characteristics to the entire basket could be more efficiently used instead. Therefore, we expect that the hedge is more likely to be composed of those stocks that are highly correlated with the return of the ETF. Using the return co-movement between each underlying security and the ETFs it belongs to as a proxy for the 'quality' of the hedge, we examine the association of such co-movement with the number of broker non-votes for a given stock. Consistent with our expectations, we find that the increase in broker non-votes with phantom shares is higher for the underlying stocks that are more likely to be used as a hedge.

As increases in phantom shares increase the percentage of sidelined votes, they are likely to affect the probability of a given proposal passing or failing. This is especially important given that a substantial number of firms have phantom shares greater than 1% of shares outstanding, as Figure 2 shows, with many firms' phantom shares exceeding 5% levels in certain years. To assess the economic implications of phantom shares from this perspective, we test the direct impact of sidelined votes by modeling the probability of different proposals passing. As this setting typically relies on the counterfactual that the phantom shares would have been voted by the ETF sponsors, we modify our operational phantom shares variable by assigning a vote direction (for/against) to the phantom shares based on how the ETF sponsor voted the shares they actually held in custody. We analyze all shareholder proposals and contested (pass or fail within a margin of 5%) shareholder proposals that address governance items (Bach and Metzger (2019)). We find that an increase in phantom shares that would have been voted in favor of the proposal, but were not (due to being sidelined), significantly decreases the probability of these proposals passing. Next, we exploit a special setting where assigning a vote direction to the phantom shares is not necessary: proposals where shares outstanding serve as the base for voting outcomes. In this setting, any sidelined vote will count as an 'against' vote, as it would be added to the denominator (shares outstanding), but is not

voted. We further confirm that increases in phantom shares lead to a reduced likelihood of passage. Overall, our findings emphasize the significant implications of phantom shares by documenting how phantom shares indeed affect the voting outcomes through sidelined votes.

As with any novel economic mechanism introduced in the literature, readers may be concerned about potential endogeneity or alternative causality driving the phantom share-proxy voting relationship we document. Simply considering how the phantom measure is constructed rules out such potential endogeneity for three reasons. First, the ETF phantom share measure is estimated over three trading days around the proxy voting record date of an underlying stock. Not only is that record date approximately two months before the actual proxy voting date, but as Hirst and Robertson (2022) show, for the vast majority of proxy votes, investors are typically not notified about what issues will be on the ballot (i.e., about the agenda of the shareholder meeting) on that record date.

Second, distinguishing between operational vs. directional shorting channels and using different ETF market-making proxies also help to rule out possible alternative causality. If phantom ETF shares are only created when an informed short-seller shorts the ETF, our results might simply reflect the incorporation of that information in the market. However, Evans et al. (2024) show that in contrast to the potential negative information contained in directional shorting, operational shorting, which can be considered as the ETF equivalent of the liquidity-supplying shorting (Comerton-Forde, Jones, and Putnins (2016)), is purely liquidity driven and does not signal future underperformance for the underlying securities of the ETF. Since we find that operational shorting is the main driver of sidelined votes, our results are unlikely to be driven by informed directional ETF short selling. Further, our results are robust when using additional proxies of ETF intraday liquidity-supplying shorting, and to the inclusion of firm-level short selling to address the potential concern that informed directional short selling is affecting or driving our results.

Third, our phantom shares estimate is created by aggregating across 30 ETFs on average, each with an average of 0.1% of their overall portfolio invested in the individual stock of interest. If there is an informed trading strategy for a particular stock around its proxy voting record date that is driving our results,

trying to implement that strategy using ETFs would be both expensive and cumbersome given the large number of ETFs that would need to be traded, and the very small percentage of the stock of interest held by those ETFs. Simply put, because our measure of phantom shares is calculated based on liquidity-motivated short selling over a three-day window around a proxy voting record date that occurs two months before the actual voting and on which date the actual proxy voting items are typically not known by investors, it is implausible for phantom shares to be endogenously related to the proxy voting outcome for any reason other than the vote sidelining we identify.

While this paper is the first to examine the impact of phantom ETF shares on shareholder voting, prior work has explored the issue of short selling, "phantom shares," and empty voting for traditional equities (e.g., Martin and Partnoy (2005), Hu and Black (2006), Christoffersen et al. (2007), Kahan and Rock (2008), Welborn (2008), Aggarwal, Saffi, and Sturgess (2015), and "artificial" shares in Apfel et al. (2001)). Some of this literature makes the important point that securities lending may be associated with over-voting both directly, as market participants borrowed shares over the voting record date in order to vote them, and indirectly, as multiple claims of ownership may give rise to more than one vote per share. In contrast to this finding of over-voting, our results suggest that phantom ETF shares are associated with reduced voting. The difference stems from two sources. First, this early literature about securities lending and proxy voting contributed towards the motivation of changes in voting regulation, including the Dodd-Frank rules about broker voting on non-routine matters that helped to curb over-voting. Second, unlike borrowing or short selling individual equities, the connection between phantom ETF shares and voting on the underlying is not direct. Rather, ETF shares in and of themselves have no associated voting rights; it is the securities underlying the ETF shares that have associated voting rights. The nature of these underlying securities and the location of these securities (e.g., the actual stocks underlying the ETF being held by the AP or a broker, as opposed to by the sponsor/custodian) determine whether they are voted.

The accuracy and transparency of the U.S. proxy voting process have also increasingly been under the spotlight of the SEC. Following up on the SEC's July 2010 "Concept Release on the U.S. Proxy System" (SEC (2010)) and the November 2018 "Roundtable on the Proxy Process" (SEC (2018)), which provide

the blueprint for the proxy system in the U.S. and discuss "proxy plumbing" problems such as over- and under-voting, the Investor Advisory Committee (IAC) of SEC has recently called for a deeper investigation of the impact of securities lending on voting rights (SEC (2019)). We believe our paper makes a timely contribution to this inquiry. In particular, while the SEC's proxy voting regulatory focus in recent years has been on curbing potential over-voting, our results suggest that the pendulum may have swung too far the other way. In an effort to avoid both the appearance of impropriety and the regulatory and liability issues associated with "empty voting", market participants are leaving shares unvoted.

Overall, our paper contributes to the literature on corporate control and governance by introducing novel measures of the separation of cash flow rights and voting rights: phantom shares of the ETF and the corresponding underlying securities. We also show that, separate from index funds as alternative passive investment vehicles, this disassociation of economic exposure and voting rights arises from the unique short-selling and liquidity provision aspects of the ETF market, and distorts shareholder voting, a fundamental corporate governance mechanism. Given the dramatic increase in ETF assets worldwide, this is an important difference relative to other passive vehicles that should give investors, managers, and regulators pause. Indeed, phantom shares are costly for investors, since they do not convey voting rights to ETF owners, but they are sold at the full price of share reflecting both cash flow rights and voting rights. The novel mechanism we introduce for sidelined votes can be interpreted as an exogenous shock to the shareholder voting turnout, and hence contributes to the existing literature on voting turnout and its effects on firm governance (Yermack (2010)).

The rest of the paper proceeds as follows. Section 1 describes the data used and our approach to estimating ETF and underlying security phantom shares. Section 2 looks at how proxy votes cast are affected by phantom shares, compares the directional and operational shorting channels, and presents evidence for the hedging mechanism in our findings. Section 3 examines the implications of phantom shares on corporate vote outcomes. Section 4 discusses the findings and concludes.

1. Data and Methodology

1.1. ETF and Proxy Voting Data

The database used in our analysis is constructed from a number of different sources. Appendix B contains a list and description of all variables used in the analysis. The ETF data, including holdings, is obtained from the CRSP Mutual Fund Database. We supplement the holdings data, prior to 2010, when CRSP holdings data is not available for all ETFs, using Thomson-Reuters Global Ownership database. Our initial ETF sample consists of all U.S. Equity ETFs, excluding levered ETFs, from the beginning of 2004 through the end of 2018. Panel A of Table 1 shows the summary statistics for the ETFs. The average ETF size is $1.752 billion, and the median ETF size is $147.2 million. Consistent with a largely passive investment approach, the average expense and turnover ratios are 0.515% and 50.96%, respectively.

To better characterize the underlying holdings of the ETFs and to add firm specific variables, we then merge the holdings data with CRSP and Compustat. We also add aggregate institutional holdings data from the Thomson-Reuters Global Ownership database as well as aggregate index fund ownership from the CRSP holdings database used above. Panel B of Table 1 has the average statistics of these firms including firm age and institutional ownership.

(~Insert Table 1 about here~)

While the databases mentioned above are more commonly used in academic research, our final data source, the fund-level and firm-level voting data, may not be as familiar to academic readers, so we describe this database in greater detail. Specifically, we use N-PX data compiled by Institutional Shareholder Services (ISS), a leading proxy advisory firm, as the source of our ETF and mutual fund voting record information. In 2003, the SEC adopted a rule requiring mutual funds and other registered management investment companies to disclose proxy vote records for the most recent twelve months ending June 30 of each year via the form N-PX with August 31 as the filing deadline (SEC (2003)). The filing requires detailed disclosure of the policies and procedures used to guide proxy vote decisions, typically reported in the Statement of Additional Information (SAI), along with the proxy voting record for each

security in each mutual fund portfolio. The filing includes a brief identification of the matter voted on, information about whether the matter was proposed by the management or a shareholder, how the fund voted (e.g., for or against the proposal, or abstain; for or withhold regarding the election of directors), and specifically whether the fund's vote aligned with management's recommendation or not.

In order to map the ISS N-PX data on WRDS with our ETF and mutual fund holdings data, we extract the ETF and mutual fund ticker information from the header of the N-PX filings using the WRDS SEC Analytics Suite. Specifically, we first extract the detailed series information, class/contract information, as well as the share class name, and ticker symbol for each N-PX filing, then map this data to the ISS N-PX records by matching the N-PX FileID to the SEC's accession number. This merged sample consists of 9,631,901 voting records on 6,556 different U.S. public companies from 1,150 ETFs.

We then merge this fund-company level voting data with the company voting results dataset also compiled by ISS. This dataset provides information on the vote results reported in the 8-K or 10-Q filing subsequent to the firm's annual meeting. According to ISS voting data manual, the vote results represent the summary of the voting by all investors, including ETFs. These results include the total votes for, against, abstaining, broker non-votes, and the vote outcome along with the ISS vote recommendation for each item. The dataset also includes the vote requirement threshold, an indication of how the percentage voting threshold necessary for a proposal to pass is calculated, which is primarily relevant for proposals requiring supermajorities. The vote outcome is derived from the comparison of the support rate and the required threshold disclosed by the company. If the support rate is greater than or equal to the threshold, "Pass" is recorded, or "Fail" otherwise.

We also obtain two important dates for each annual shareholder meeting, the meeting date and the record date, from the ISS dataset as well. The meeting date on which the vote is held, and the record date on which the vote proxies are issued using the ownership of shareholders as of that date. We use the record date in the ISS vote results dataset to construct the actual ownership of ETFs and their holdings of individual securities in the ETF portfolio corresponding to their voting rights claims.

1.2. Estimating Phantom ETF and Underlying Shares

While we explain our methodology for estimating phantom ETF and underlying shares in detail in Appendix A, in this subsection, we summarize our approach. As described above, the number of phantom ETF shares is simply the difference between the total number of ETF shares held by investors and the actual number of ETF shares created and outstanding. How can these two numbers differ? If existing shares of the ETF are sold short to other investors, this effectively increases the total number of shares held by investors. In other words, the number of ETF shares sold short is equal to the number of phantom ETF shares. Matching the daily ETF shares outstanding data to the biweekly ETF short interest data from Compustat, we estimate the phantom ETF shares.[7] The summary statistics for ETF shares outstanding, shares held short and short interest ratio are given in Panel C of Table 1.

To estimate the number of phantom underlying shares, we first multiply the number of phantom ETF shares by the ETF net asset value (NAV), which yields the phantom ETF assets under management (AUM). Multiplying this phantom ETF AUM by the ETF's percentage ownership of each underlying security, and then dividing by the price of the underlying security gives us the number of phantom underlying shares for each security held by the ETF.

We then add the fund voting records on day *t–3* before the record date (i.e., on the cum-date) of the company vote, to allow for settlement of traded shares. As the ISS fund vote file does not report the number of shares voted by the ETF, we assume that the ETF votes all of the underlying shares owned. From this, we assign all of the shares owned by the ETF in the underlying as being voted either for or against, using the ETF vote direction indicated in the ISS data. For each company-meeting-agenda item, we then aggregate all ETF shares voted for or against the item to create an aggregated measure of ETF votes for or against the agenda item. Lastly, as phantom shares would not have voting rights, we do not assign a vote direction to

[7] In previous versions of the paper, we also estimated phantom ETF shares by taking the difference between 13F holdings of the ETF and the ETF shares outstanding. While this estimate only provides a lower bound on phantom ETF shares (because not all holdings are included on the 13F) and is based on quarterly data, our results are similar using this alternative measure.

those shares. Instead, we only use the aggregate number of phantom shares implied by ETF ownership, in the underlying stock on the cum-date. This gives us our sample of company votes, where each agenda item from a meeting has a total number of ETF underlying shares voted for or against, and the total number of phantom shares.

(~Insert Table 2 about here~)

Table 2 gives the summary statistics for the phantom underlying shares, the overall voting data (i.e., votes for, votes against, and broker non-votes), and the voting by ETFs and index mutual funds (IMFs). The overall average ETF percentage ownership of underlying firms across our sample is 3.489%. The phantom share average is relatively high in comparison. Of the total ETF share ownership (phantom *plus* regular ETF underlying shares, 4.073%), phantom share ownership of the underlying is 14%. The dollar or value-weighted measure of phantom shares indicates an almost three times larger percentage of the underlying shares outstanding. Further, as Figure 2 shows, more than a third of the stocks in the Russell 3000 have phantom shares greater than 1% of shares outstanding.

1.3. Estimating Phantom Shares: An Example

To illustrate our approach to measuring phantom shares, we examine a specific example of XRT, the S&P Retail Industry ETF, and Netflix, one of its holdings. Focusing on Netflix's April 5th, 2011 proxy voting record date when the ability to participate in the proxy vote is determined, the number of XRT shares outstanding on March 31st, 2011 cum-date (*t–3* trading days before that proxy voting record date) is 19.8 million (the actual proxy voting date for Netflix in this example was June 3rd, 2011). While this is the actual number of ETF shares that had been created as of that date, we calculate the number of phantom ETF shares using the short interest ratio around this date. On March 31st, 2011, the short interest ratio for XRT was 736%. Using this short interest ratio (736%) and the actual XRT shares outstanding (19.8 million), we calculate the number of phantom ETF shares as just over 145.7 million, so the total number of ETF shares

owned, both regular and phantom, is approximately 165.5 million.[8] Because only 11.9% of the total XRT shares owned have actually been created, this means only 11.9% of the ETF shares are backed by underlying securities held and voted by the ETF sponsor. Put another way, only 11.9% of XRT shares held by investors have associated voting rights.

Using this measure of the total ETF shares held by investors (outstanding ETF shares *plus* phantom ETF shares), we can then estimate both the number of Netflix shares owned and voted by the sponsor and the number of phantom Netflix shares. As of March 31st, 2011, 1.29% of the XRT ETF assets were held in Netflix, translating to 456,956 total shares, of which 402,287 are phantom underlying shares and 54,669 are regular underlying shares which are voted. While the SEC N-PX filing only requires ETFs to disclose the direction of their vote (i.e., yes, no, or abstain) not the number of shares voted, for a small subset of the N-PX data, the actual shares of underlying security voted by the ETF are disclosed. As a result, we are able to assess our estimate of shares voted versus the actual number voted. In the case of XRT, they disclosed that they voted 38,216 shares of Netflix, in line with the 54,669 regular underlying shares from our estimate above.[9]

[8] To account for the possibility that a single or a small number of ETFs may contribute to the firm-level phantom shares, which in turn may affect our results, we run three robustness tests in Table IA.3. First, to account for outlier observations, we exclude the top (bottom) 5% of the phantom share distribution. Second, we create a firm-level phantom shares Herfindahl index to account for the concentration of phantom shares from a given ETF, and include the index in our main regressions. Finally, we include a top ETF fixed effect and cluster standard errors by top ETF and meeting. In each setting, our main results are unchanged.

[9] One possible explanation for the difference between the number of Netflix shares voted (38,216) and the number of actual Netflix shares held by XRT (54,669) is securities lending by ETF sponsor (State Street Global Advisors or SSGA). If some of the shares of Netflix held by SSGA are lent over the proxy voting record date, these shares would not be voted by SSGA but could be voted by the borrowers. While we abstract from the role of individual equity lending by ETF sponsors in this paper, we note that this is unlikely to affect our results for three reasons. First, as we show in Section 2.4, uninformed operational short selling is the dominant mechanism for our findings. Second, we control for firm-level short-sale/lending supply in our tests, effectively capturing the lending of these shares. Third, by abstracting from the shares lent, our estimate of phantom shares is conservative. In a recent work, Hu, Mitts, and Sylvester (2021) find that share lending is a greater concern after the end of our sample period – a change in SEC rules in 2019 has tilted the share lending-voting tradeoff towards lending for index funds.

2. Phantom Shares and Proxy Voting

2.1. Proxy Voting Analysis Setup

For each company meeting date, our three main dependent variables are: (i) the total number of shares voted for the agenda item, (ii) the total number of shares voted against the agenda item, and (iii) the total number of broker non-votes. Our primary independent variables are the phantom underlying shares and the underlying shares actually held by the sponsor, both aggregated across ETFs. These measures will be consistent across all agenda items for each company meeting. However, our measures of ETF underlying shares voted for and ETF underlying shares voted against may vary across each agenda item of a company meeting, since different ETFs may vote in different directions. Finally, we scale all our main dependent variables by the total number of potential votes outstanding, reported by ISS.[10]

We then remove routine and inconsequential agenda items. First, we exclude any agenda item where the vote requirement to pass is equal to 1%. We do this as these votes are formalities and could, in most cases, be passed by the votes of insiders. Second, we exclude any director election. We do this as SEC rule changes regarding broker voting may cause uncertain behavior of broker non-votes. Prior to 2010, brokers were allowed to vote their shares in director elections. However, after 2010, the SEC no longer allowed the brokers to vote their shares in director elections. In a later test, we will repeat our main tests on the sample of only director elections. Third, we also exclude the ratification of auditors, as brokers can vote uninstructed on these items throughout our sample, as well as any item that did not pass or fail. Finally, we exclude outliers where the total number of votes (aggregating for votes, against votes, and broker non-votes) is greater than the ISS votes outstanding. Excluding director elections and applying these additional filters leaves us with a sample 49,568 company-meeting-agenda item observations.

As discussed above, we posit that phantom shares lead to sidelined votes. Hence, we do not assign

[10] In Tables IA.1 and IA.2, we repeat our baseline tests in Tables 3 and 4 using different bases for voting outcomes, respectively: (i) the reported base of the vote from ISS, (ii) votes for *plus* votes against, (iii) votes outstanding excluding dual-class firms, and (iv) shares outstanding excluding dual-class firms. We find our findings to be robust to the alternative definitions of vote bases.

the phantom shares as being voted for or against the agenda item; instead, we include the total number of phantom shares in each of our main specifications. As the ETF/IMF underlying shares should be voted, we include ETF/IMF underlying shares voted for in the votes for regression, and ETF/IMF underlying shares voted against, in the against vote regressions. Finally, the aggregate measures of both IMF and ETF underlying shares are included in the broker non-vote regressions.

To rule out potential confounding factors, such as time trends in proxy votes across different items (e.g., trends in voting on certain ESG-related items, such as say on pay, board diversity, declassifying the board, emissions, etc.) and time-invariant firm characteristics, each regression includes agenda item-by-year in addition to firm fixed effects. Standard errors are clustered by firm and meeting. We control for the size and age of the firm, as well as the book-to-market and return on assets. Additionally, we control for total institutional ownership. Furthermore, to address the potential effects of informed directional short selling at the stock level, we control for short-sale supply. Lastly, to control for the potential of recent firm performance to affect our results, we include a six-month momentum measure for the firm as of the meeting date. Appendix B provides a detailed description of control variables. Consequently, our votes cast sample consists of a total of 27,615 meetings for 4,311 firms.

2.2. Relation of Phantom Shares to Votes Cast

Table 3 presents our main results examining the relationship between phantom shares and shareholder votes cast in company meetings. The dependent variables in Columns 1, 2, and 3 are for votes, against votes, and broker non-votes, respectively. In Columns 1 and 2 of Table 3, we find that an increase in the number of phantom shares leads to less voting, both for and against, consistent with our hypothesis that phantom shares will reduce overall yea and nay votes cast. The effect is statistically significant at a 1% level in the case of for votes, and not significant in the case of against votes.[11] We also observe that

[11] The relationship between phantom shares and against votes is statistically significant without the item-time fixed effects. The primary reason for this change seems to be the clustering of negative votes for certain voting items (e.g., say on pay) over time. A secondary reason may be the low power of the against votes, since against votes only constitute 4.4% of all votes, which contributes towards not having enough variation, especially with the inclusion of item-time fixed effects. Interestingly, the relationship between phantom shares and against votes remains significant with the alternative measure of phantom shares based on ETF daily turnover, as reported in Panel A of Table IA.4.

ETF/IMF underlying shares voted for (against) positively relate to overall for (against) votes in Column 1 (2), as expected.[12]

(~Insert Table 3 about here~)

In Column 3 of Table 3, we examine the relationship between phantom shares and broker non-votes, our primary focus in this paper. As we discussed earlier, if the phantom underlying shares are held long as a hedge for the short (i.e., phantom) ETF share position, it is common practice for APs or arbitrageurs to abstain from voting those shares. As a result, an increase in phantom shares should result in an increase in the number of broker non-votes cast. Column 3 provides evidence consistent with this hypothesis.[13] Importantly, we also find that our aggregate measures of ETF underlying shares do not have a positive and significant relationship with broker non-votes. As these regular ETF shares have both economic and ownership rights, we should not see a positive relationship between them and broker non-votes.

Overall, the results in Table 3 provide support for our initial hypothesis that for certain shareholders of ETFs, their shares do not carry ownership rights in the underlying stock, which in turn leads to fewer votes cast at company meetings.

2.3. Rule Change: Broker Voting on Non-Routine Matters

There is evidence in the literature showing that brokers typically vote uninstructed shares with management, particularly in routine management proposals. For instance, Bethel and Gillan (2002) report

[12] While the sign on the coefficients of ETF/IMF underlying shares voted for and against are positively correlated with for votes and against votes, respectively, the coefficients differ from one. Following our discussion in Section 1, and as Form N-PX disclosures are limited to mutual funds and other investment companies, we cannot observe the actual number of shares voted by the various institutional and non-institutional entities. Further, economic forces such as securities lending, separately managed accounts that mirror the voting of their public mutual fund counterparts but that are not disclosed in SEC filings, or other correlated factors that we do not have proxies for may lead to coefficients that are greater or smaller than one. However, our primary result that phantom shares are positively related with broker non-votes is robust to using alternative denominators for the dependent and independent variables. For example, Table IA.1 repeats the analysis of Table 3, using different denominators, and finds the main results to be robust.

[13] Our findings in Column 3 provide evidence that underlying shares are being used as a hedge as part of the shorting process, consistent with our findings in Section 2.5. If it were the case that phantom ETF shares are all backed by cash or futures (rather than by underlying shares), we would not observe a relationship between phantom shares and broker non-votes.

that such uninstructed broker votes amount to approximately 11 to 14% of the votes cast. Cai, Garner and Walkling (2009) find that brokers vote on average 13.1% of outstanding shares, and eliminating broker's votes would reduce overall for votes by 2.5%, a significant impact considering that directors typically receive only about 5% withhold votes. As discussed in Yermack (2010), broker voting was introduced in the 1930s to boost shareholder participation at annual meetings in order to meet quorum requirements.

We extend our study of phantom shares and votes cast by exploiting two SEC regulatory changes that affected uninstructed or discretionary broker votes. Prior to 2010, director elections were categorized by the SEC as 'routine', thereby enabling brokers to vote uninstructed shares, such as phantom underlying shares. In 2010, this rule was amended to eliminate uninstructed broker share voting in director elections (Akyol, Raff, and Verwijmeren (2017)). In 2012, the SEC further restricted broker uninstructed share voting for additional governance proposal items, including de-staggering the board of directors, implementing majority voting, eliminating supermajority voting, use of writer consents, rights to call special meetings, and opt-outs of anti-takeover provisions.

In Table 4, we split our phantom share variables into pre- and post-2010 (Column 1), and pre- and post-2012 (Column 2). Examining the difference in the relationship between phantom shares and broker non-votes before and after these exogenous changes to the voting rights of brokers in director elections, provides further evidence of the causal nature of our proposed mechanism.

(~Insert Table 4 about here~)

In Column 1 of Table 4, we use a piecewise regression to examine the relationship between phantom underlying shares and broker non-votes around the SEC rule change. Prior to 2010, we find an insignificant coefficient on the phantom shares measure; a sign that brokers were actively voting their shares in director elections. After the rule change, we find a positive and significant coefficient on the phantom share measure. Repeating the analysis for the 2012 rule change in Column 2 of Table 4, we again find a positive and significant coefficient on the post-2012 phantom shares, after voting was restricted, and no relationship between phantom shares and broker non-votes prior to 2012. These findings corroborate the impact of phantom ETF and associated phantom underlying stocks on voting outcomes in Table 3, and

address potential endogeneity concerns, exploiting this plausibly exogenous regulatory change.

2.4. Operational vs. Directional ETF Shorting

Our analysis so far has focused on phantom shares, measured using overall ETF short interest levels, regardless of the nature of the ETF shorting activity. However, ETF shorting could be "directional" or "operational." We define directional shorting as borrowing ETF shares with the goal to short sell them for speculative or hedging purposes. Operational shorting results primarily from the market-making activities as APs provide liquidity to the ETF market. Evans et al. (2024) show that operational shorting is a significant component of the overall short interest in ETFs and is an essential component of ETF liquidity provision.

As we propose that vote sidelining results from ETF market-making activities, we expect the operational shorting component of the overall ETF short interest to be the primary driver of the ETF phantom shares on voting participation and outcomes. Operational shorting arises when APs arbitrage the price difference between an ETF (i.e., market price) and its underlying securities (i.e., NAV) through the creation and redemption process, and they adjust the supply of ETF shares to accommodate investor demand. In instances of excess demand by ETF investors, the ETF price will be higher than the price of the underlying securities (NAV), creating an arbitrage opportunity that APs exploit by immediately selling ETF shares short (i.e., before the actual ETF shares are created).

APs typically lock in the arbitrage profit by buying (and hedging with) a subset of the underlying securities with the promise to create the equivalent ETF creation units in the future (see ICI (2014) for more details of the ETF arbitrage process). By purchasing the sponsor-determined basket of underlying securities at NAV, and then selling those ETF shares in the market, the AP accommodates investor demand and earns profits based on the ETF vs. NAV price difference (ETF mispricing). The short ETF position will be closed as soon as the AP transfers the underlying basket securities to the sponsor (e.g., BlackRock) in exchange for new ETF shares (creation units). The creation process typically happens at the end of the trading day, or several days later, and, in some instances, does not happen at all (if prices revert and mispricing

disappears, allowing the market maker to close short positions in the secondary market). It is important to note here that if the creation process is delayed by three or more days, this would automatically trigger a fail-to-deliver (FTD) position in these ETF shares, which we will also employ as a final robustness check.[14]

Repeating our analysis of broker non-votes by separating the shorting activity into "operational" and "directional" provides a validation of the hedging mechanism. While directional short selling of ETFs may or may not involve a long position in the underlying, operational shorting is likely to be hedged for at least three reasons. First, APs are given regulatory exemptions in their liquidity provision role in the ETF arbitrage process, enabling them to short sell ETF shares before they are created (Evans et al. (2024)); however, those exemptions are only valid for liquidity provision and not for short positions that are part of a directional/unhedged strategy. Second, because ETF shares are typically created in large and discrete creation unit orders consisting of between 50,000 and 200,000 shares, an AP is "operationally" more inclined to hedge an operational-short ETF position with the underlying securities until she builds up the demand for a full future creation unit order. During that time, the remaining stocks in the ETF basket would be assembled to complete the creation unit order, which would then be delivered to the ETF sponsor in exchange for the newly created ETF shares. Third, a common assumption in the theoretical literature on liquidity provision that is validated in the accompanying empirical literature is that market makers have a "preferred" inventory position and deviations from that preferred level are an important consideration in the trades of liquidity suppliers (Stoll (2003), and Glosten, Biais, and Spatt (2005)). In the context of ETFs, this would be consistent with APs hedging their short ETF positions with the underlying, especially given the ETF share creation process described above.

In Table 5, we examine the differences between operational and directional shorting. We start by splitting ETF shorting into its operational and directional components, and then analyze how much each channel contributes to our findings. To separate the components, we use a measure of directional shorting,

[14] Short selling, and even failing to deliver the short-sold shares, is allowed for market makers for bona fide market-making purposes and market makers typically enjoy three more settlement days than typical investors: https://www.sec.gov/investor/pubs/regsho.htm.

Total Demand Quantity (TDQ) from the IHS Markit Securities Finance database. TDQ measures the total ETF shares on loan to both Markit and non-Markit borrowers from Markit and non-Markit security lenders. It is the most expansive measure of directional ETF shorting from the Markit database. The difference between total short interest from Compustat and this directional shorting measure is our estimate of operational shorting. As reported in Panel C of Table 1, operational shorting (directional shorting) represents, on average, two-thirds (one-third) of the total ETF short interest, which illustrates the significance of the ETF liquidity provision. Translating these ETF 'operational' and 'directional' phantom share measures into similar measures for underlying securities, we then re-run our analysis of the determinants of broker non-votes from Table 3. The results are reported in Table 5.

(~Insert Table 5 about here~)

Our results in Column 1 of Table 5 show that operational shorting contributes to the increase in broker non-votes, while the coefficient on directional shorting in Column 2 of Table 5 is positive but insignificant. When including both measures in the same regression in Column 3 of Table 5, we do find that the coefficient of the 'operational' phantom share measure remains positive and significant, and that the coefficient of the 'directional' phantom share measure remains insignificant.

These results are important for two reasons. First, they validate our suggested hedging-based vote-sidelining mechanism: as conjectured, the broker non-vote results are stronger for the operational shorting channel, which is likely to be hedged. Second, as operational shorting of ETFs is purely for liquidity reasons and has no effect on the returns of the underlying, as Evans et al. (2024) show, this analysis helps to rule out the possibility that our main tests are only picking up the sentiment from informed short sellers.

As another test of our conjectured hedging mechanism, we use ETF FTDs to proxy for ETF operational shorting due to market-making activities. When APs delay the creation of ETF shares to cover their operational short positions and given that market makers enjoy three more settlement days beyond the standard clearing times, operational short ETF positions that are not closed before the standard clearing times would automatically result in failure-to-deliver positions. Evans et al. (2024) document that ETF FTDs account for over 80% of settlement failures in U.S. financial markets in recent years and attribute the

vast majority of these FTDs to AP operational shorting and market-making activities. Therefore, we believe that the ETF FTD measure would represent a conservative and independent proxy for the AP shorting activities, which are likely hedged using underlying securities, effectively sidelining these shares from the voting process. In Column 4 of Table 5, we use ETF FTDs to estimate the phantom shares generated from operational shorting. Consistent with our other evidence, this alternative proxy for operational shorting is strongly statistically related to broker non-votes. It is also important to note that FTDs are a conservative measure of operational shorting, as fails are only recorded when an operational short position lasts more than three days. For this reason, reported fails are correlated with operational shorting that does not result in FTDs but represents an understated proxy for the overall operational shorting activity, which leads to the larger coefficient we observe in Column 4 of Table 5.

Finally, as an additional robustness check for the role of operational shorting/AP liquidity provision driving our results, we turn to a recent literature documenting short volume as a proxy for intraday liquidity provision by market makers (e.g., Comerton-Forde, Jones, and Putnins (2016)). Heavily traded ETFs that are more subject to demand shocks require ETF market makers to provide liquidity by short selling the ETF shares, as described above.

To create this measure, we first extract the daily short volume information for each ETF using data feeds reported by individual exchanges after August 2009: NYSE, ARCA, NASDAQ, BATS, FINRA's TRF, and ORF. Then, we use the total ETF daily short volume as well as the ETF daily turnover, building on the idea that heavily traded ETFs are associated with higher market making intensity, as two alternative proxies for phantom ETF shares and use them to validate the baseline results in Tables 3 and 4. Table IA.4 provides the results using these two alternative proxies. The results in Panels A and B of Table IA.4 are relatively unchanged using these two market-making-centric proxies, which confirm our baseline results in Tables 3 and 4 and corroborate the role of ETF market making behind phantom shares and the votes sidelining in the underlying securities.

Overall, our findings in Tables 5 and IA.4 confirm that ETF market-making and the related hedging activities associated with operational shorting, but not directional short selling for speculative purposes, are

driving the phantom shares sidelining of proxy votes. Based on these results, going forward in the paper, we use only the phantom shares that arise from operational shorting (i.e. operational phantom shares) in our remaining analyses.

2.5. Hedging Mechanism

As described earlier, the potential mechanism through which underlying shares are sidelined from the proxy voting process is their use as a hedge for a short ETF position. In this subsection, we provide further evidence supporting this proposed hedging mechanism in two ways. First, we provide anecdotal evidence that APs, brokers, equity lenders and other institutional market participants have internal policies not to vote those securities that are part of a hedged position, out of a desire to avoid "empty voting" issues. Second, recognizing that there is variation within a portfolio as to the hedge quality of different securities (i.e., higher correlation with the entire portfolio leading to better hedge quality), we examine if the proposed relationship between phantom shares and broker non-votes varies with the quality of the hedge.

To better understand the internal rules of the institutional market participants regarding the voting of hedged positions, we turn to the European Securities and Market Authority's (ESMA's) survey of such participants: "Call for Evidence on Empty Voting" on September 14th, 2011 (ESMA/2011/288). In this survey, the ESMA asked market participants about their voting practices with respect to securities used to hedge or as collateral:

> *"Internal policies relating to voting practices*
> *Q5. What kind of internal policies, if any, do you have governing the exercise of voting rights in respect of securities held as collateral or as a hedge against positions with another counterparty?"*

Consistent with the responses of other market participants reported in Appendix C, J.P. Morgan and the International Securities Lending Association (ISLA) answered the above question as follows, respectively [emphasis added]:

> *"…J.P. Morgan has a separate internal policy* ***to abstain from voting in most instances of hedge trading positions, as they are temporary in nature****."*

*"An ad hoc survey of lenders confirmed that **lenders have not, nor ever would exercise any voting rights in respect of securities held as collateral**. The majority of written governance policies are worded specifically to exclude the voting of collateral."*

While anecdotal, the answers to ESMA's questionnaire provide two important pieces of evidence. First, they confirm both the awareness of and sensitivity to empty voting issues on the part of market participants. Second, and more importantly, they confirm our conjecture that the securities held as a hedge for phantom ETF shares are not voted.

While this anecdotal evidence is compelling, if such policies are in place, empirically we should see stronger evidence of sidelined votes with the underlying securities that are more likely to be used as a hedge for the ETF shares that are sold short by APs. In Table 6, we examine the effect that the underlying shares have on the relationship between operational phantom shares and broker non-votes. Due to the variation in the hedge quality of the underlying stocks in the shorted ETF basket, we expect that the sidelined votes are likely concentrated in the subset of securities that are more likely to be held as hedges by APs as a part of their market-making activities. To construct a proxy for the hedge quality for each stock in the ETF basket, we compute the 60-day rolling correlation between the stock's daily returns and the returns of the ETF.

(~Insert Table 6 about here~)

Stocks in the ETF basket that have higher return correlations with the ETF are more likely to be used as hedges for the operational phantom ETF shares. Because a given stock is held by multiple ETFs, we construct a single stock-level correlation measure for each date by position value- and equal-weighting the different correlations of that stock with the various ETFs that hold it. In Columns 1 and 2 of Table 6, we use an indicator variable of whether this value-weighted or equal-weighted average stock correlation, respectively, is 'Above Median' as our measure of hedge quality. In Columns 3 and 4 of Table 6, we use a decile rank of this value- and equal-weighted stock correlation, respectively, as our measure of hedge

quality. With these proxies in hand, in Table 6, we repeat our analysis of the determinants of broker non-votes from Table 3 controlling for hedge quality. Using either hedge proxy, we find that the increase in broker non-votes is stronger for stocks that are more likely to be held as hedge. This result is consistent with APs selecting more efficient hedging strategies and the securities associated with those hedges being less likely to be voted, in line with the near universal non-voting policy in hedge trading positions attested to by ESMA above. In a related vein, Tepe (2016) discusses the broker-dealers use of "idle" customer assets, securities, and uninvested cash remaining with the broker-dealer due to inactive trading.

3. Voting Outcomes: Proposal Pass Rate

In the previous section, we analyze the effect of phantom shares on the quantity of the votes cast. In this section, we examine the impact of phantom shares on the pass rates of important proposals. Given the inefficiencies the phantom shares create in the voting process, we expect phantom shares to affect (and possibly flip) the passage of contentious (close-vote) items.

While phantom shares may reduce votes for and against, and increase broker non-votes, the question remains if there is any material impact on voting outcomes, especially given recent evidence that retail/individual shareholders are also active and influential in corporate voting (Brav, Cain, and Zytnick (2022) and Gantchev and Giannetti (2021)). Figure 2 shows that more than a third of the stocks in the Russell 3000 have phantom shares greater than 1% of shares outstanding. Building on these facts, we represent a direct test of the economic significance of the true effects of phantom shares on the corporate voting process.

We start our examination by looking at the total number of actual votes where phantom shares, if voted, would have altered the outcome. For this purpose, we first assign a vote (for/against) to the operational phantom shares in the same direction that the ETF votes its other shares, and then analyze the voting outcomes (similar to the counterfactual scenario analysis in Brav, Cain, and Zytnick (2022)). We then examine a subset of proxy proposals, where the vote percentage in favor or against is calculated relative to shares outstanding, as opposed to the total shares voted. In these cases where shares outstanding serve as

the base for voting outcome percentage, there is no need to assign a vote direction to the operational phantom shares, because any sidelined shares (reflected as broker non-votes) would count as 'against' votes.

As an initial assessment of the economic importance of phantom shares, we analyze how these shares, if voted, would have shifted key proxy voting outcomes in close votes. The proxy items considered in our analysis include crucial votes to adopt majority voting, to declassify the board of directors, and to require a majority vote for the election of directors. We first analyze both contested management proposals as suggested by Listokin (2008) and shareholder governance proposals as suggested by Cunat, Gine, and Guadalupe (2012), using a +/-5% cutoff to determine close votes. In this setting, we find that phantom shares (operational phantom shares), if voted, would have changed the outcome of 2.50% (1.48%) of the 1,081 contested proposals, consisting of 600 management and 481 shareholder governance proposals.

We then repeat the analysis using a +/-1% cutoff motivated by Bach and Metzger (2019), who report that approximately 75% more shareholder proposals have been rejected by a margin of one percent than proposals approved by a similar narrow margin in the U.S. from 2003-2016. This cutoff is of particular importance given the substantial number of stocks with more than 1% of phantom shares, as illustrated in Figure 2. In this setting, we find that the outcomes of 10.41% (7.24%) of the 221 contested proposals, consisting of 117 management and 104 shareholder governance proposals, would have flipped if the phantom shares (operational phantom shares) had been voted. As ETFs continue to grow we would expect these numbers to increase, especially during times of crisis, heightened ETF short selling, and increased market volatility, the precise times when corporate control matters more.

To better assess this economic significance, we examine the impact of phantom shares on voting outcomes in a regression setting after including several controls, such as the actual votes cast by ETF and index funds. In Table 7, we estimate the probability of passing for shareholder proposals (Column 1), contested shareholder governance proposals (Column 2), and contested proposals, including both the management and the shareholder governance proposals (Column 3). Following Bach and Metzger (2019), we define the contested proposals as those (close) votes within the margins of 5% of passing threshold (e.g.,

with *ex post* share being between 45% and 55%, for majority voting cases). All variables are standardized, and we use OLS regressions with item-by-year and industry fixed effects. Similar to Table 3, we designate the hypothetical voting direction of operational phantom shares based on the ETF's voting decision (for or against) for the underlying shares that were actually held by the sponsor.

(~Insert Table 7 about here~)

The results confirm that, in the case of both shareholder proposals (Column 1 of Table 7) and contested shareholder governance proposals (Column 2 of Table 7), an increase in operational phantom shares decreases the probability of shareholder proposals passing. These phantom shares of the underlying securities are owned by ETF that would otherwise have cast their vote in favor of the proposal, and consequently change the outcome of the vote. The implications are significant. In our sample, shareholder proposals (contested shareholder governance proposals) pass 20% (36%) of the time. Our results in Column 1 (2) of Table 7 suggest that a one standard deviation increase in phantom shares voted for would lower the pass rate to 13.5% (10%).[15]

Finally, we explore the choice of the denominator of vote measures in assessing the effect of phantom shares on vote outcomes. In Columns 1 and 2 of Table 7, we exclude any item where shares outstanding are used to calculate the percentage of support, and ultimately to decide if the vote passed or failed, because a broker non-vote will act as a de-facto against vote since it adds to the denominator but does not affect the numerator. In Column 3 of Table 7, we exploit this effect of the vote measure denominator to further test the effect of phantom shares on pass rates. Using a sample of contested proposals, which includes both the management proposals (Listokin (2008)) and the shareholder governance proposals (Cunat, Gine, and Guadalupe (2012)), we interact our operational phantom shares

[15] Shareholder votes (e.g., for a particular shareholder proposal) could be informative and be perceived as an important signal to act on by the management, even though that vote fails. For instance, analyzing activist pension plans, Del Guercio and Hawkins (1999) find that even shareholder proposals that fail to get a majority of voting support are associated with significant changes at target firms, such as higher management turnover. Focusing on shareholder proposals on environmental and social (E&S) issues, He, Kahraman, and Lowry (2022) argue that the shareholder votes in those proposals are informative by illustrating that higher support in failed E&S proposals predicts subsequent E&S incidents.

measure with items where the base is shares outstanding. Consistent with broker non-votes acting as 'against' votes in these settings, we confirm that irrespective of the direction the ETF sponsor may have voted their shares, the presence of operational phantom shares reduces the likelihood that contested proposals pass when the base is shares outstanding.

Overall, when shares of the underlying securities are not voted because they are held by the APs as a hedge, as described above, the phantom shares that would have been voted in favor of a proposal, negatively affect the probability of the proposal passing. Consequently, we conclude that phantom shares have real and material effects on the corporate voting process.

4. Discussion and Conclusion

This paper analyzes the impact of ETF shorting on the shareholder voting of underlying securities. We introduce a novel measure of the wedge created between the economic ETF ownership and the voting rights of ETF underlying shares, which we call phantom shares, and analyze the implications of these phantom shares on the voting process and voting outcomes.

We find that phantom ETF shares are costly for investors, since they do not convey voting rights to ETF owners, but are sold at the full price of share, which reflects both cash flow rights and voting rights. Phantom shares also seem to create inefficiencies within the voting process by increasing the broker non-votes and decreasing the shares voted in the shareholder meetings. This becomes particularly important in cases with close votes.

Our findings highlight an important phenomenon given the recent surge of ETFs and have important policy implications. Specifically, the sidelining of underlying shares from the proxy voting process due to ETF liquidity provision and market-making activities creates inefficiencies in exercising control rights, and, in turn, the corporate governance and market for corporate control. These inefficiencies are likely to be exacerbated for the firms with phantom shares particularly during times when markets are bearish and/or when the votes are critical. This fragility is distinct from the one discussed in Bhattacharya and O'Hara (2018), who argue that ETFs also have the potential to alter the informational efficiency of

underlying markets and introduce fragility via herding. We believe our findings with ETFs are particularly important when considered against the simple alternative of investing in index funds which are backed fully by the underlying securities held by a custodian and voted by the sponsor. In other words, index funds do not suffer from a similar lack of voting rights.

Many have argued that the U.S. proxy voting system needs to be updated due to various inefficiencies and inaccuracies discussed in the corporate law literature (see, e.g., Kahan and Rock (2008), Barrett (2009), Donald (2011), and Brooks (2014)). Similarly, there is a need for a robust regulatory framework for ETFs (Hu and Morley (2018)). We believe our findings may inform efforts to create these related systems and frameworks. In particular, our results highlight the fact that existing financial regulation seems to focus more on cash flow rights, at the expense of other contractual rights of the shareholders, such as the right to vote. Additionally, while the SEC's proxy voting regulatory focus in recent years has been on curbing potential over-voting, our results suggest that the pendulum may have swung too far the other way, with market participants leaving shares unvoted to avoid both the appearance of and the regulatory liability associated with "empty voting".

We also believe the phantom shares measure we have introduced here may prove helpful to academic researchers as a plausibly exogenous instrument for the change in ownership and control. Indeed, phantom shares could be exploited in numerous potential applications to address important and interesting issues in corporate finance/governance (e.g., the analyses of voting premiums and acquirer returns). We leave this to future research.

Appendix A: Phantom Share Variable Construction

In Section 1.2 we provide a brief description of the calculation of the phantom share variables. In this Appendix, we start with a short numerical example of phantom shares, then go into further detail about the specifics of how we create the variable and the data sources we use.

With the precise daily ETF Holdings and ETF short interest data, the calculation of our phantom share variable would be quite simple. To illustrate this, let us assume that ETF A has a short interest ratio of 50%, owns 10,000 shares of Firm A on the record date for Firm A's annual meeting, and is the only ETF that holds Firm A. In order to obtain the number of phantom shares on the record date of the annual meeting, we simply multiply the short interest ratio of 50% by the 10,000 shares owned, to arrive 5,000 phantom shares of Firm A. If Firm A has 100,000 shares outstanding, then in our regressions *ETF Underlying Shares* would be 10% (10,000 ÷ 100,000), and *Phantom Shares* would be 5% (5,000 ÷ 100,000). *ETF Underlying Shares – Voted For (Against)* would be 10% if the ETF votes for (against) an agenda item. If multiple ETFs hold the stock, we simply repeat this step for each ETF that owns Firm A on the record date. The formula for phantom share calculation can be seen below, where *i* represents the firm, *t* represents the ETF, and *d* is the record date of the annual/special meeting:

$$Phantom\ Shares_{i,d} = \sum_{i,t,d=1}^{N} Shares\ Owned_{i,t,d} \times ETF\ Short\ Interest_{t,d}$$

The above example would require us to have daily ETF short interest data and daily ETF holdings. As we do not have such data, we take steps to ensure that our phantom share measure is as accurate as possible. We begin with the most recent ETF holdings data observation, which gives the number of shares of the underlying held by the ETF. Because the holdings report date does not necessarily coincide with the voting record date, we need to estimate the shares of the underlying held by the ETF on the record date of interest.

First, we replicate the month/quarter end holdings data using the ETF price, and shares outstanding of the ETF on the report date, and the percentage weight in the portfolio. We do this, as we will have to estimate fund holdings around the record date, and need to ensure that we are able to accurately estimate holding values using external data. As ETF shares outstanding vary slightly across the data providers, we replicate the ETF holdings using three different data sources: CRSP, Morningstar, and Bloomberg. The percentage weight in the portfolio for each stock is another possible source of error, as in some cases holdings with smaller weights will be less accurate due to rounding of the reported weight in the holdings data. To account for this, we also compute the weights of the holdings using the reported dollar values of holdings, and total net assets of the fund. We then use all combinations of the holdings weights and shares

outstanding measures to replicate the fund holdings in the underlying. We take the most accurate combination and use that measure of shares outstanding and holdings weight until the next ETF report date. We drop any observation where we are not able to replicate the holdings value within a 5% margin of the reported holdings in CRSP.

Once we have the number of shares held at month end, we then compute the number of shares owned by the ETF on the cum-date which is three trading days before the record date, to allow for settlement of traded shares. First, we adjust the portfolio weight of each stock based on the return of the stock from the report date of fund holdings, to the cum-date of the company meeting. The shares of stock held by the ETF are then calculated using this new weight, the daily shares outstanding, NAV of the ETF, and price of the stock. Next, we then calculate the number of phantom underlying shares. The Compustat Supplemental short interest file reports short interest biweekly, and we take the most recent reported short interest for the ETF. To calculate the short interest ratio of the ETF, we scale the short interest of the ETF by the shares outstanding from the provider (Bloomberg, CRSP, Morningstar) that gave the closest match for the fund holdings. With the ETF short interest ratio in hand, we simply multiply the number of ETF shares of the stock held on the record date by the short interest to obtain the number of phantom shares. Finally, we then sum the dollar values over all the ETFs that hold a particular firm on the cum-date to obtain our ETF and phantom share ownership variables for the proxy vote.

Appendix B: Variable Definitions and Sources

Variable Name	Definition
Fundamental Data (Source: CRSP and Compustat)	
Six-Month Momentum	Return of the stock over the six months prior to the shareholder meeting.
Book-to-Market	Market value of equity / Book value of equity.
Assets	Total firm assets.
Return on Assets	Net income / Total assets.
Firm Age	Number of years since the IPO of the firm.
Institutional Ownership	Percentage of shares outstanding owned by institutions, excluding ETFs, index funds, and blockholders.
Short-Sale Supply Ratio	Short Interest as a fraction of short-sale supply, proxied by the level of institutional ownership.
ETF-Stock Return Correlation (vw/ew)	The value (equal) weighted return correlation between the firm and all of the ETFs that own shares.
ETF Data (Source: CRSP Mutual Fund Database)	
Total Net Assets	Total net assets of the fund.
Return	Return of the ETF in the reporting month.
Expense Ratio	Ratio of the fund's annual operating expenses by the average dollar value of its assets under management.
Turnover Ratio	The minimum of aggregated sales or purchases of securities, divided by the average 12-month total net assets of the fund.
Fund Age	Number of years since the fund was introduced.
Net Flows	Net flows into the ETF in the month that holdings were reported.
ETF Ownership Data (Source: CRSP, Bloomberg, Morningstar)	
ETF Shares Outstanding	Number of ETF shares outstanding reported by CRSP/Bloomberg/Morningstar.
ETF Shares Held Short	Short interest of the ETF taken from Compustat.
ETF Short Interest Ratio (SIR)	ETF shares held short / ETF shares outstanding (reported on the same day as the holdings of the ETF).
ETF SIR: Directional Shorting	ETFs held short using share lending date from Markit / ETF shares outstanding (reported on the same day as the holdings of the ETF).
ETF SIR: Operational Shorting	The difference between ETF short interest and ETF short interest: directional shorting. It is set to zero if ETF SIR: directional shorting is greater than ETF SIR.
Operational SIR	ETF SIR: Operational Shorting / ETF SIR (% of ETF SIR).
ETF Underlying Shares	Number of shares in the underlying firm held by all ETFs in our sample.
IMF Underlying Shares	Number of shares in the underlying firm that are held by all Index Mutual Funds in our sample.
Phantom Shares	Total number of phantom underlying shares implied by ETF short interest, as a percentage of shares outstanding.
Phantom Shares: Voted For (Against)	Total number of phantom underlying shares implied by ETF short interest, where the ETF voted for (against) the agenda item, as a percentage of potential votes.
Phantom Shares: Directional Shorting	The number of phantom shares calculated using share lending data from Markit. Directional ETF short interest is calculated as shares on loan, as reported by Markit, divided by shares outstanding.
Phantom Shares: Operational Shorting	The difference between the phantom shares: directional shorting, and our main phantom shares variable. It is set to zero if phantom shares: directional shorting is greater than phantom shares.
ETF Fail-to-Deliver (FTD)	Number of ETF fail-to-deliver (in shares) reported by the National Securities Clearing Corporation.
ETF Fail-to-Deliver Ratio	Defined as the ratio of the ETF fail-to-deliver divided by the total ETF shares outstanding.
Phantom Shares: FTDs	Phantom shares created using the ETF fail-to-deliver ratio, rather than ETF short interest.

Variable Name	Definition
Voting Related Data (Source: ISS, OptionMetrics)	
Votes For	Total number of votes "for" the agenda item, as a percentage of potential votes.
Votes Against	Total number of votes "against" the agenda item, as a percentage of potential votes.
Broker Non-Votes	Total "broker non-votes" for the agenda item, as a percentage of potential votes.
Phantom Shares: Voted For	Number of phantom shares associated with ETFs that voted for the agenda item, as a percentage of shares outstanding.
Phantom Shares: Voted Against	Number of phantom shares associated with ETFs that voted against the agenda item, as a percentage of shares outstanding.
ETF Underlying Shares: Voted For	Number of underlying shares owned by ETFs that voted for the agenda item, as a percentage of shares outstanding.
ETF Underlying Shares: Voted Against	Number of underlying shares owned by ETFs that voted against the agenda item, as a percentage of shares outstanding.
IMF Underlying Shares: Voted For	Number of underlying shares owned by Index Mutual Funds that voted for the agenda item, as a percentage of shares outstanding.
IMF Underlying Shares: Voted Against	Number of underlying shares owned by Index Mutual Funds that voted against the agenda item, as a percentage of shares outstanding.
Shareholder Sponsored	Takes the value of 1 for agenda items proposed by shareholders, 0 otherwise.
ISS Against	Takes the value of 1 for agenda items opposed by ISS, 0 otherwise.
Shares Outstanding Base	Takes the value of 1 if the base used to calculate the pass rate of the agenda items is shares outstanding, 0 otherwise.

Appendix C: Feedback to ESMA's Questionnaire on Empty Voting

European Securities and Market Authority (ESMA) conducted a "Call for Evidence on Empty Voting" on September 14th, 2011 (ESMA/2011/288). ESMA was fact-finding for possible rule-making and coincidentally asked institutional market participants the following question relevant to our paper:

- "*Internal policies relating to voting practices*
  Q5. What kind of internal policies, if any, do you have governing the exercise of voting rights in respect of securities held as collateral or as a hedge against positions with another counterparty?"

ESMA's "Feedback Statement" on "Call for Evidence on Empty Voting" on June 29th, 2012 (ESMA/2012/415) summarizes the responses to question #5 above as follows:

- "*Only 11 interested parties fully replied to this question, while a few respondents just declared they have no internal policy on the exercise of voting rights within their normal business activity. Five respondents asserted that the voting right attached to these securities is not exercised. Three contributors affirmed that they (or their members) recall (or encourage to act accordingly) any lent shares before the record date, especially when voting in contentious situations or for significant issues. Other replies more specifically stated that e.g. the voting rights cannot be exercised in order to benefit from trading book exemption; or they discouraged the borrowing of securities for the purposes of voting; or simply the rights remain assigned to the beneficial owner.*"

Some excerpts from the individual responses of the institutions to ESMA's question #5 above are below (sourced from ESMA's website, available upon request):

- **J.P. Morgan**
  "*J.P. Morgan adheres to industry standards and practices as referenced herein in relation to not facilitating the borrowing of securities for the purposes of voting. Through its Prime Brokerage business, it is able to prevent voting in respect of any borrowed securities that it lends to hedge fund clients, to the extent that they are retained on its Prime Brokerage books and records. J.P. Morgan also has strict vetting procedures around counterparties to which it is willing to lend securities within its Equity Finance business.*
  In addition, the Worldwide Securities Services division of J.P. Morgan does not permit lending clients to vote on securities held as collateral in its securities lending programme. Furthermore, through our derivatives activity, clients are aware that no voting rights are passed through the contract and J.P. Morgan has a separate internal policy to abstain from voting in most instances of hedge trading positions, as they are temporary in nature."

- **International Securities Lending Association (ISLA)**
  "*An ad hoc survey of lenders confirmed that lenders have not, nor ever would exercise any voting rights in respect of securities held as collateral. The majority of written governance policies are worded specifically to exclude the voting of collateral.*"

- **BNP Paribas**
  "*With regard to the shares held for our own account in a trading book, the voting rights attached to the shares held as hedging of such positions cannot be exercised if it is intended to benefit trading book exemption. If the voting rights are exercised and consequently the exemption of trading book not applied, the Transparency declarations have to be provided in accordance with French law (threshold disclosures and, if applicable, disclosures on securities lending before general meeting).*

  With regard to the shares owned in collateral for client's transactions, the voting rights should not be used by the credit institution or investment firm."

- **Hermes Equity Ownership Services**
  "*Given our approach to see such activity as market abuse, it should not come as a surprise that we do not vote stock held as collateral or a hedge.*"

- **Aviva Investors**
  "*We do not vote these shares*"

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Figure 1: Voting Implications of Stock, Mutual Fund and ETF Ownership

The figure illustrates the voting implications of investing $1 into: (i) a common stock, (ii) a mutual fund, and (iii) an ETF.

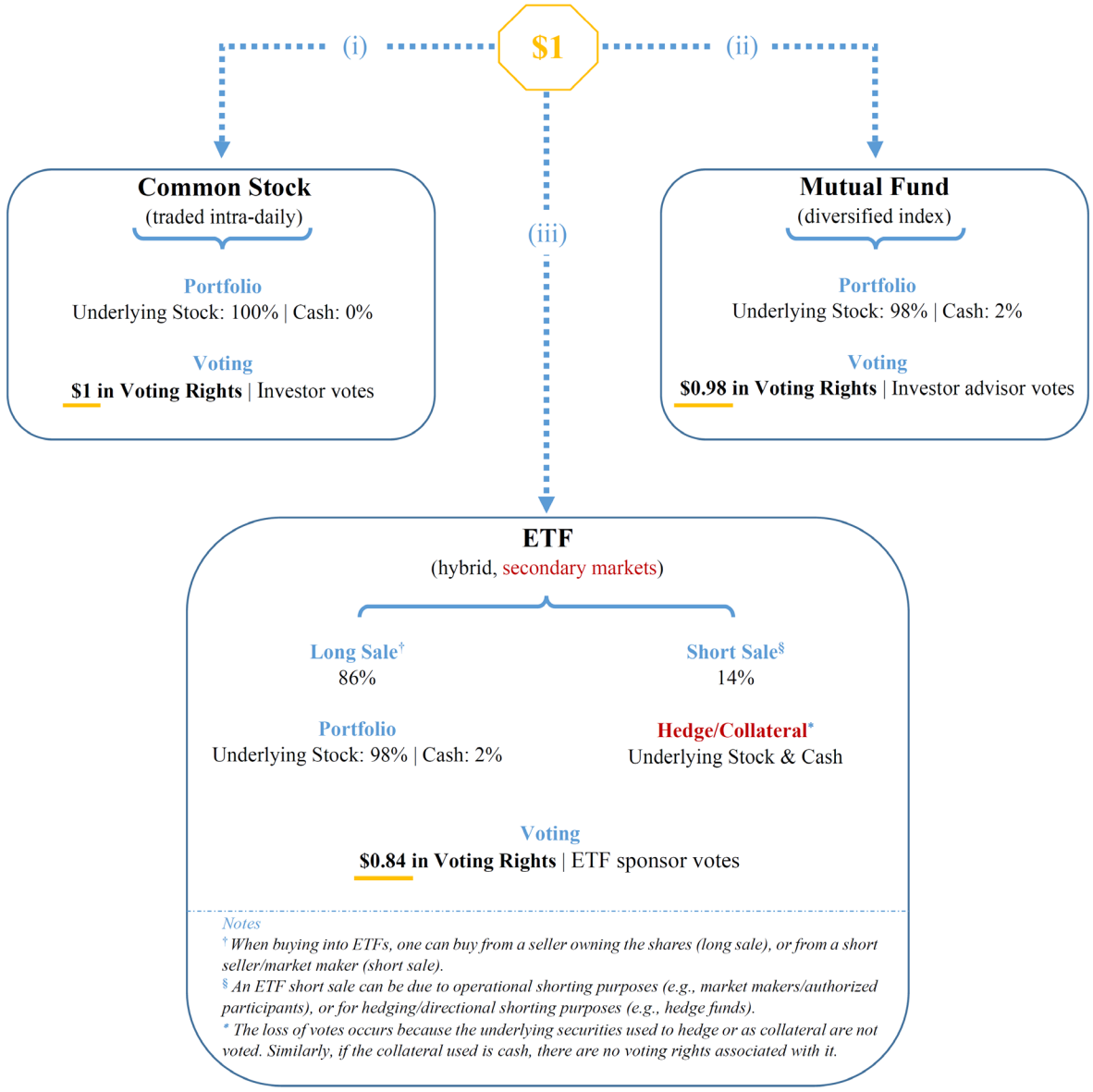

Figure 2: Number of Firms with Significant Phantom Shares

The figure illustrates the total number of firms with phantom shares greater than 1% of shares outstanding (solid, blue line), and the total number of Russell 3000 firms with phantoms shares greater than 1% of shares outstanding (dashed, red line), from January 2004 to December 2021. Firm-level phantom shares are computed using month-end ETF short interest and holding information.

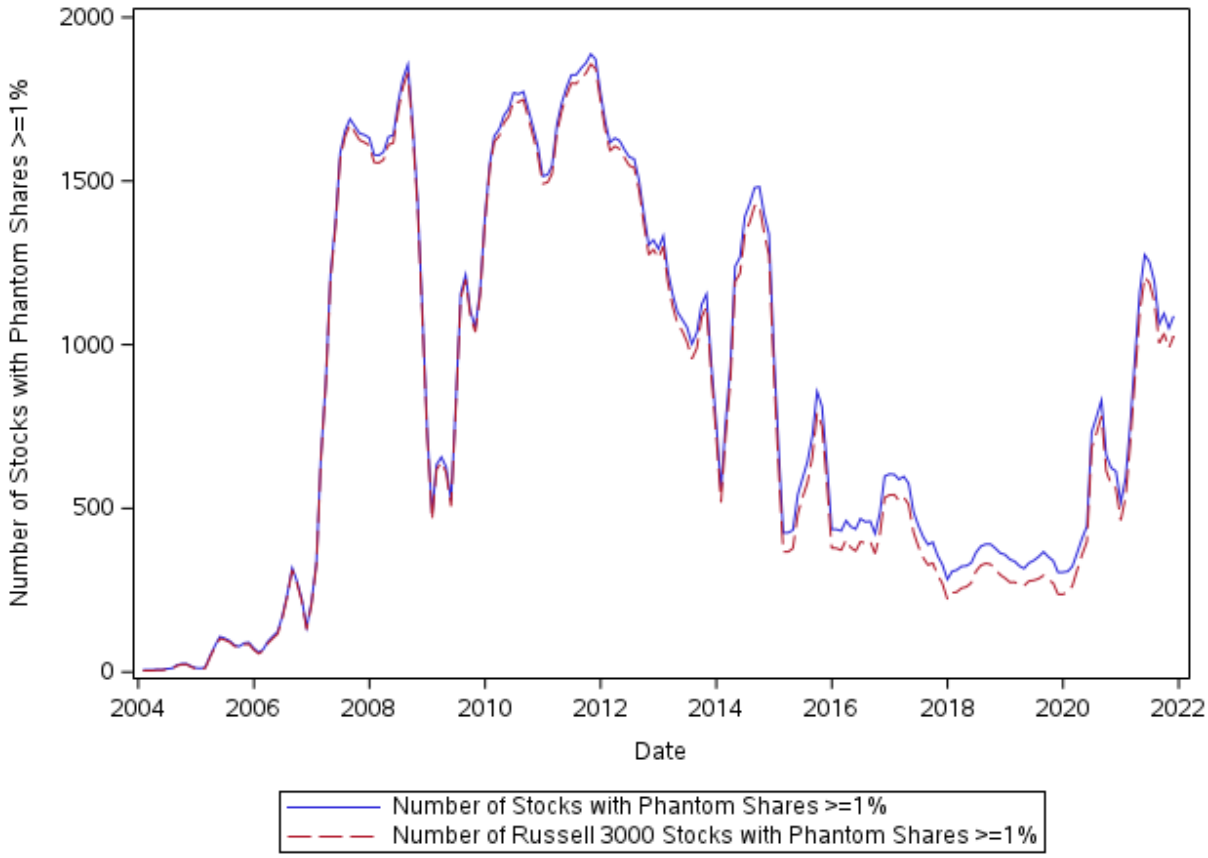

Table 1: Summary Statistics for ETFs, Underlying Shares, and ETF Ownership

In this table, we present the summary statistics for the ETFs, the underlying firm characteristics, and the ETF ownership in our sample, which is based on 6,556 U.S. public firms from 1,150 ETFs between 2004 - 2018. Panel A presents summary statistics for the ETFs in our sample. Observations are taken at the date ETFs report holdings. Panel B reports summary statistics on the firms in our sample of company votes. Each observation here is an agenda item of a meeting. Panel C presents summary statistics for the institutional ownership, shares outstanding, and short interest of ETFs. All variables are defined in Appendix B.

Panel A: Summary Statistics for ETFs

Variables	Obs	Mean	StDev	p1	p25	p50	p75	p99
Total Net Assets ($M)	76,089	1,752	8,737	1.663	30.73	147.2	718.4	27,285
Return (%)	77,493	0.728	5.011	–13.32	–1.156	0.747	3.007	14.48
Expense Ratio (%)	69,012	0.515	0.335	0.05	0.1	0.29	0.47	0.96
Turnover Ratio (%)	67,546	50.96	113.3	3	4	12	27	152
Fund Age (years)	74,785	6.636	5.002	0.0833	2.5	5.833	9.75	21
Net Flows (%)	71,642	2.928	15.9	–37.46	–1.3	0	3.909	100.2

Panel B: Summary Statistics for Underlying Firms

Variables	Obs	Mean	StDev	p1	p25	p50	p75	p99
Six-Month Momentum (%)	44,859	10.48	38.85	–63.38	–7.971	7.184	23.68	133.1
Book-to-Market	43,452	0.627	0.637	0.033	0.292	0.503	0.791	2.789
Assets	44,948	11,139	81,078	13.92	300.7	1,044	3,733	161,385
Return on Assets (%)	44,901	–0.109	67.54	–26.75	–0.151	0.543	1.694	7.658
Firm Age (years)	44,952	22.41	16.34	3	10	18	30	66
Institutional Ownership (%)	42,654	60.16	26.41	1.95	42.40	64.83	79.25	109.8
Short Interest Supply	42,539	8.449	9.918	0.126	2.563	5.245	10.33	59.26

Panel C: Summary Statistics for ETF Ownership

Variables	Obs	Mean	StDev	p1	p25	p50	p75	p99
ETF Shares Outstanding (‘000)	76,094	23,340	70,655	50	950	3,600	14,250	333,316
ETF Shares Held Short	75,744	2.34e+06	1.56e+07	2	3,929	23,569	169,567	5.28e+07
Short Interest Ratio (SIR)	73,335	0.057	0.296	0.000	0.002	0.007	0.025	0.903
ETF SIR: Directional Shorting	69,635	0.0156	0.077	0	0.000188	0.00128	0.00562	0.28
ETF SIR: Operational Shorting	68,624	0.0427	0.261	0	0.000733	0.0038	0.0162	0.724
Operational Shorting (% of SIR)	68,183	0.635	0.348	0	0.383	0.747	0.943	1
ETF Fail-to-Deliver (FTD)	78,309	30,434	383,814	0	101	751	8,619	413,998
ETF Fail-to-Deliver Ratio	75,947	0.00512	0.0665	0	2.90E-05	0.000275	0.0017	0.0745

Table 2: Summary Statistics for Phantom Shares and Voting Measures

In this table, we present the summary statistics for the phantom shares and voting measures that we use in our main regressions. Phantom shares and proxy voting outcomes are based on a sample of voting records from 6,556 different U.S. public companies by 1,150 ETFs between 2004 - 2018. All variables are defined in Appendix B. All statistics below are reported as percent of shares outstanding, and in percentage figures. Votes For, Votes Against, Broker Non-Vote, ETF Underlying Shares, ETF Underlying Shares: Voted For, ETF Underlying Shares: Voted Against, IMF Underlying Shares, IMF Underlying Shares: Voted For, and IMF Underlying Shares: Voted Against are in stock-date-item observation units; Phantom Shares are in stock-date observation units.

Variables	Obs	Mean	StDev	p1	p25	p50	p75	p99
Phantom Shares	329,254	0.584	0.619	4.38e-05	0.133	0.448	0.839	2.682
Phantom Shares (Pre 2011)	126,763	0.481	0.522	0.000353	0.123	0.331	0.656	2.028
Phantom Shares (Post 2011)	202,491	0.649	0.664	1.70E-05	0.163	0.535	0.901	3.083
Votes For	328,205	74.97	142.7	8.94	67.46	79.42	86.84	97.88
Votes Against	328,263	4.981	9.815	0.00	0.532	1.544	4.387	54.41
Broker Non-Vote	327,543	6.998	9.632	0.00	0.00	3.654	10.81	42.53
ETF Underlying Shares	329,254	3.489	3.217	0.006	1.035	2.660	5.027	13.95
ETF Underlying Shares: Voted For	288,643	2.782	2.707	0.00	0.574	2.175	4.089	11.69
ETF Underlying Shares: Voted Against	288,643	0.078	0.473	0.00	0.00	0.00	0.00	2.419
IMF Underlying Shares	323,315	5.273	3.705	0.034	2.130	5.001	7.730	15.28
IMF Underlying Shares: Voted For	264,684	1.786	2.329	0.00	0.075	0.804	2.604	10.15
IMF Underlying Shares: Voted Against	264,684	0.072	0.470	0.00	0.00	0.00	0.00	2.226

Table 3: Phantom Shares and Votes Cast

In this table, we examine the effect of Phantom Shares on the number of votes cast for each agenda item at shareholder meetings. The dependent variable is the number of shares voted for the agenda item in Column 1, the number of shares voted against in Column 2, and the number of broker non-votes in Column 3, all as a percentage of potential votes taken from ISS. We exclude director elections, ratification of auditors, and any agenda item that has a pass requirement of 1%. All independent variables are defined in Appendix B. All models include item-by-year and firm fixed effects. Standard errors clustered by firm and meeting are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	**(1)** **For**	**(2)** **Against**	**(3)** **Broker Non-Vote**
Phantom Shares	–0.770*** (–4.222)	–0.076 (–0.772)	0.312*** (2.782)
ETF Underlying Shares: Voted For	0.757*** (10.589)		
IMF Underlying Shares: Voted For	0.661*** (15.281)		
ETF Underlying Shares: Voted Against		2.078*** (14.037)	
IMF Underlying Shares: Voted Against		1.697*** (22.379)	
ETF Underlying Shares			–0.030 (–0.869)
IMF Underlying Shares			–0.118*** (–3.369)
Shareholder Sponsored	–0.295*** (–35.052)	0.209*** (30.670)	0.057*** (18.207)
ISS Against	–0.150*** (–57.743)	0.135*** (55.752)	–0.001 (–1.385)
Assets (log)	0.002 (0.874)	0.007*** (4.584)	–0.006*** (–3.205)
Firm Age	–0.002* (–1.738)	–0.000 (–0.286)	0.001** (2.202)
Institutional Ownership	0.075*** (7.689)	0.045*** (7.397)	–0.038*** (–6.932)
Six-Month Momentum	0.002 (0.618)	–0.006*** (–4.300)	–0.002 (–1.365)
Book-to-Market	–0.018*** (–4.395)	0.003*** (2.587)	0.006*** (3.400)
Return on Assets	0.111*** (3.447)	–0.019 (–1.389)	–0.012 (–0.641)
Short-Sale Supply	–0.140*** (–7.961)	–0.033*** (–3.226)	0.069*** (5.013)
Observations	40,204	40,239	48,400
R-squared	0.873	0.888	0.662
Item*Year + Firm FE	Yes	Yes	Yes

Table 4: Broker Non-Votes Around SEC Rule Changes

In this table, we examine the effect of Phantom Shares on the number of votes cast in director elections, and governance-related items around changes in broker voting rules. In 2010 (2012), the SEC changed the definition of director elections (other governance items) from routine to non-routine items; meaning that after the rule change, brokers were no longer able to vote their shares uninstructed. These 2012 items include de-staggering the board of directors, implementing majority voting, eliminating supermajority voting, use of writer consents, rights to call special meetings, opt-outs of anti-takeover provisions. For this test, we include only the agenda items that are director elections in Column 1, and only those items affected by the 2012 rule change in Column 2. We split the Phantom Shares measure using the Post 2010 dummy. Phantom Shares: Pre 2010 (Post 2010) replicate the Phantom Shares variable in Table 3, but takes the value of zero for years after 2010 (before 2010). The same is done using 2012 as the cutoff in Column 2. All firm controls are the same as Table 3 and are defined in Appendix B. Firm and year fixed effects are included in Column 1, item-by-year and industry fixed effects are included in Column 2. Standard errors clustered by firm and meeting in Column 1, and by industry in Column 2, are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	**(1)** **Broker Non-Vote**	**(2)** **Broker Non-Vote**
	Director Elections	***2012 Rule Change Items***
Phantom Shares: Pre 2010	0.098	
	(0.538)	
Phantom Shares: Post 2010	0.355***	
	(2.911)	
Phantom Shares: Pre 2012		–0.199
		(–0.393)
Phantom Shares: Post 2012		2.227**
		(2.396)
ETF Underlying Shares	–0.069*	0.013
	(–1.694)	(0.098)
IMF Underlying Shares	–0.154***	–0.062
	(–4.451)	(–0.664)
Observations	189,110	1,630
R-squared	0.763	0.499
Year + Firm FE	Yes	No
Item*Year + Industry FE	No	Yes
Controls	Yes	Yes

Table 5: Directional vs. Operational ETF Shorting

In this table, we examine the relationship between broker non-votes and Phantom Shares after decomposing Phantom Shares measure into a component due to *directional* shorting, and another component that arises from *operational* shorting due to market-making activities. The last column uses a conservative proxy of extreme operational shorting that results in Failures-to-Deliver shares (*FTD*s). In all columns, the dependent variable is *broker non-votes* scaled by potential votes. All independent variables are defined in Appendix B. In this table, we exclude director elections, ratification of auditors, and any agenda item that has a pass requirement of 1%. All models include item-by-year and firm fixed effects. Standard errors clustered by firm and meeting are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	**(1) Broker Non-Vote**	**(2) Broker Non-Vote**	**(3) Broker Non-Vote**	**(4) Broker Non-Vote**
Phantom Shares: *Operational* Shorting	0.531***		0.550***	
	(3.419)		(3.467)	
Phantom Shares: *Directional* Shorting		0.150	–0.087	
		(0.770)	(–0.485)	
Phantom Shares: *FTD*s				4.909**
				(2.565)
ETF Underlying Shares	–0.041	–0.006	–0.041	–0.010
	(–1.154)	(–0.177)	(–1.154)	(–0.283)
IMF Underlying Shares	–0.122***	–0.111***	–0.123***	–0.111***
	(–3.462)	(–3.174)	(–3.464)	(–3.171)
Observations	48,400	48,400	48,400	48,400
R-squared	0.662	0.662	0.663	0.662
Item*Year + Firm FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Table 6: Phantom Shares and Hedge Mechanism

In this table, we examine the relationship between Phantom Shares that arise from *operational* shorting and broker non-votes for firms that are more likely to be posted as hedge. In all columns the dependent variable is broker non-votes as a percentage of potential votes. ETF-Stock Return Correlation is the main variable of interest and is defined in Appendix B. Columns 1 and 2 use a High ETF-Stock Return Correlation an indicator variable if the ETF-Stock Return Correlation is above the sample median, and Columns 3 and 4 sort firms into deciles based on the ETF-Stock Return Correlation. All control variables are the same as Table 3, and are defined in Appendix B. In this table, we exclude director elections, ratification of auditors, and any agenda item that has a pass requirement of 1%. All models include item-by-year and firm fixed effects. Standard errors clustered by firm and meeting are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	**(1)** **Broker Non-Vote**	**(2)** **Broker Non-Vote**	**(3)** **Broker Non-Vote**	**(4)** **Broker Non-Vote**
	Above Median		***Correlation Decile Rank***	
Phantom Shares: *Operational* Shorting	0.359*	0.327*	0.089	0.096
	(1.894)	(1.793)	(0.352)	(0.380)
ETF-Stock Return Correlation (vw)	–0.003*		–0.001**	
	(–1.695)		(–2.048)	
ETF-Stock Return Correlation (vw) × Phantom Shares: *Operational* Shorting	0.330*		0.080**	
	(1.835)		(2.385)	
ETF-Stock Return Correlation (ew)		–0.003		–0.001**
		(–1.614)		(–2.043)
ETF-Stock Return Correlation (ew) × Phantom Shares: *Operational* Shorting		0.420**		0.081**
		(2.366)		(2.368)
Observations	45,689	45,689	45,689	45,689
R-squared	0.669	0.669	0.669	0.669
Item*Year + Firm FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Table 7: Phantom Shares and Proposal Pass Rate

In this table, we examine the effect of Phantom Shares that arise from *operational* shorting on the pass rate of important votes in a panel OLS specification. The dependent variable in each column is a dummy variable that takes the value of one if the vote passed. We standardize all independent variables so that each coefficient reported in the table represents the likelihood of passing for a one standard deviation increase. The sample in: Column 1 is shareholder proposals; Column 2 is contested (within the margins of 5% of passing threshold) shareholder governance proposals; and Column 3 is contested proposals, including management and shareholder governance proposals. Columns 1 and 2 exclude any item where the base is shares outstanding. All other controls are the same as in Table 3 and are defined in Appendix B. All models include item-by-year and industry fixed effects. Standard errors clustered by industry are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	**(1)** **Pass** ***Shareholder Proposals***	**(2)** **Pass** ***Contested Shldr Gov Proposals***	**(3)** **Pass** ***Contested Proposals***
Phantom Shares: *Operational* Shorting -Voted For	–0.065***	–0.264***	
	(–3.476)	(–3.144)	
Phantom Shares: *Operational* Shorting -Voted Against	0.003	–0.010	
	(1.213)	(–0.896)	
Phantom Shares: *Operational* Shorting			–0.016
			(–0.703)
Shares Outstanding Base			0.128*
			(1.861)
Shares Outstanding Base × Phantom Shares *Operational* Shorting			–0.135**
			(–2.246)
ETF Underlying Shares: Voted For	0.200***	0.187**	0.006
	(7.212)	(2.218)	(0.189)
ETF Underlying Shares: Voted Against	–0.015***	0.010	0.001
	(–5.745)	(0.560)	(0.191)
IMF Underlying Shares: Voted For	0.058**	0.036	0.058
	(2.151)	(0.276)	(1.278)
IMF Underlying Shares: Voted Against	–0.002	–0.023**	–0.014*
	(–0.905)	(–2.087)	(–1.954)
Observations	6,156	413	972
R-squared	0.583	0.319	0.346
Item*Year + Industry FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Vote Base	Exclude shares outstanding	Exclude shares outstanding	Include shares outstanding

Internet Appendix

Phantom of the Opera: ETF Shorting and Shareholder Voting

This is an addendum to our paper "Phantom of the Opera: ETF Shorting and Shareholder Voting". In Table IA.1 and Table IA.2, we re-estimate Table 3 and Table 4 of our paper, respectively, using alternative vote bases. Table IA.3 uses alternate sample selection criteria, control variables, and model specifications to account for possible outliers, in terms of firms with a large number of Phantom Shares. Table IA.4 replicates our main results in Tables 3, 4, and 5 using two alternate measures of Operational Phantom Shares.

Table IA.1: Phantom Shares and Votes Cast: Alternative Vote Bases

In this table, we repeat the test from Table 3, but use alternate denominators in determining the percentage of votes for, votes against, and broker non-votes. For brevity, each reported coefficient is from a separate regression. In Row (1) the dependent variables are votes for, against, and broker non-votes as a percentage of the vote base taken from ISS. In Row (2) the dependent variables are votes for, against, and broker non-votes as a percentage of the total of votes for *plus* votes against. In Row (3) the dependent variables are votes for, against, and broker non-votes as a percentage of the votes outstanding from ISS and exclude dual-class firms. In Row (4) the dependent variables are votes for, against, and broker non-votes as a percentage of the shares outstanding from CRSP and exclude dual-class firms. All the regressions include controls that are the same in Table 3, and are defined in Appendix B. All the regressions include item-by-year and firm fixed effects. Standard errors clustered by firm and meeting are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Dependent Variable	(1) For	(2) Against	(3) Broker Non-Vote
Baseline (from Table 3)	Phantom Shares: Votes Outstanding	–0.770***	–0.076	0.312***
		(–4.222)	(–0.772)	(2.782)
(1)	Phantom Shares: ISS Vote Base	–1.117***	–0.104	0.342*
		(–7.041)	(–0.841)	(1.696)
(2)	Phantom Shares: For + Against	–1.075***	–0.119	0.376*
		(–7.258)	(–0.950)	(1.809)
(3)	Phantom Shares: Votes Outstanding (ex dual-class)	–0.836***	–0.105	0.311***
		(–4.421)	(–1.048)	(2.633)
(4)	Phantom Shares: Shares Outstanding (ex dual-class)	–0.814***	–0.108	0.318**
		(–4.316)	(–1.046)	(2.550)

Table IA.2: Broker Non-Votes Surrounding SEC Rule Changes: Alternative Vote Bases

In this table, we repeat the examination from Table 4 and broker non-votes around an SEC ruling that made brokers ineligible to vote in director elections starting in 2010 and additional items in 2012. For this test, we use the same specifications, but alter the denominator of the dependent variables. In Panel A, we repeat the test around the 2010 rule change, and Panel B repeats the test around the 2012 rule change. In each column the dependent variable is Broker Non-Votes divided by different share denominators. In Column 1, broker non-votes are scaled by the voting base taken from ISS. In Column 2, broker non-votes are scaled by the total of votes for *plus* votes against. In Column 3, broker non-votes are scaled by the votes outstanding from ISS and exclude dual-class firms. In Column 4, broker non-votes are scaled by the shares outstanding from CRSP and exclude dual-class firms. Firm and year fixed effects are included in Panel A, item-by-year and industry fixed effects are included in Panel B. Standard errors clustered by firm and meeting in Panel A, and by industry in Panel B, are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Director Elections

Dependent Variable	**Broker Non-Votes**				
	Baseline (from Table 4)	**(1)**	**(2)**	**(3)**	**(4)**
Vote Base	**Votes Outstanding**	**ISS Vote Base**	**For + Against**	**Votes Outstanding (ex dual-class)**	**Shares Outstanding (ex dual-class)**
Phantom Shares: Pre 2010	0.098	0.077	0.083	0.109	0.142
	(0.538)	(0.243)	(0.262)	(0.581)	(0.737)
Phantom Shares: Post 2010	0.355***	0.594**	0.592**	0.367***	0.390***
	(2.911)	(2.561)	(2.553)	(2.922)	(2.977)
Observations	189,110	189,408	189,408	178,955	179,115
R-squared	0.763	0.746	0.746	0.765	0.758
Firm + Year FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes

Table IA.2: Broker Non-Votes Surrounding SEC Rule Changes: Alternative Vote Bases (continued)

Panel B: 2012 Rule Change					
Dependent Variable	**Broker Non-Votes**				
	Baseline (from Table 4)	**(1)**	**(2)**	**(3)**	**(4)**
Vote Base	**Votes Outstanding**	**ISS Vote Base**	**For + Against**	**Votes Outstanding (ex dual-class)**	**Shares Outstanding (ex dual-class)**
Phantom Shares: Pre 2012	–0.199	–0.701	–0.565	–0.233	–0.191
	(–0.393)	(–0.762)	(–0.567)	(–0.445)	(–0.352)
Phantom Shares: Post 2012	2.227**	2.700**	4.391**	2.190**	2.572***
	(2.396)	(2.416)	(2.067)	(2.213)	(2.734)
Observations	1,630	1,630	1,631	1,596	1,593
R-squared	0.499	0.505	0.494	0.499	0.481
Item*Year + Industry FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes

.

Table IA.3: Phantom Shares and Votes Cast: Robustness to Potential Outliers

In this table, we repeat the test from Table 3, but use alternate samples, as well as additional controls to account for possible outliers, in terms of firms with a large number of Phantom Shares. In the Row 1, we identify the 5th (95th) percentile level of Phantom Shares each year, and exclude any firm observation below (above) the 5th (95th) percentile. In Row 2, we create a Herfindahl index to measure the concentration of Phantom Shares at the firm level. We then include this as an additional control variable. Finally, in Row 3, we include a Top ETF fixed effect, where the *Top ETF* is the ETF that contributes the largest fraction of Phantom Shares for a given firm-meeting. Standard errors clustered by firm and meeting for Rows 1 and 2, and by Top ETF and meeting for Row 3, are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Dependent Variable	**(1)** **For**	**(2)** **Against**	**(3)** **Broker Non-Vote**
Baseline (from Table 3)	Phantom Shares: Votes Outstanding	–0.770*** (–4.222)	–0.076 (–0.772)	0.312*** (2.782)
(1)	Excluding Top (Bottom) 5% of Sample	–0.635** (–2.195)	–0.279 (–1.641)	0.440*** (2.582)
(2)	Including Phantom Shares HHI as Control	–0.784*** (–4.256)	–0.055 (–0.548)	0.288** (2.532)
(3)	Including Top ETF Fixed Effect and Standard Error Cluster	–1.236*** (–3.184)	0.057 (0.287)	0.450** (2.574)

Table IA.4: Alternate Phantom Share Measures

In this table, we repeat the test from Tables 3 and 4, but use alternate measures of Phantom Shares. In Panel A, we use ETF Daily Turnover (Columns 1 to 3) and ETF Daily Short Volume (Columns 4 to 6) to create Phantom Shares and repeat the test from Table 3. We extract the daily total short volume information for each ETF, using feeds from individual exchanges reported after August 2009: NYSE, ARCA, NASDAQ, BATS, FINRA's TRF, and ORF. In Panel B, we use the same alternate measures of ETF Turnover (Columns 1 and 2) and ETF Daily Short Volume (Column 3) to replicate the tests from Table 4. All models in Panel A include item-by-year and firm fixed effects. In Panel A, standard errors, clustered by firm and meeting, are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. In Panel B, firm and year fixed effects are included in Column 1, item-by-year and industry fixed effects are included in Columns 2 and 3. Standard errors, clustered by firm and meeting in Column 1, and by industry in Column 2 and 3, are used to calculate *t*-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Votes Cast

Dependent Variable	**(1)** **For**	**(2)** **Against**	**(3)** **Broker Non-Vote**	**(4)** **For**	**(5)** **Against**	**(6)** **Broker Non-Vote**
Phantom Shares Proxy: ETF Turnover	–2.830***	–0.721**	1.047***			
	(–5.507)	(–2.504)	(3.55)			
Phantom Shares Proxy: ETF Short Volume				–5.205***	–0.630	0.956**
				(–5.551)	(–1.270)	(2.009)
Observations	40,204	40,239	40,239	32,968	32,993	32,993
Item*Year + Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.873	0.888	0.714	0.873	0.881	0.758
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Table IA.4: Alternate Phantom Share Measures (continued)

Panel B: Regulatory Changes

Dependent Variable	(1) Broker Non-Vote	(2) Broker Non-Vote	(3) Broker Non-Vote
	Phantom Shares Proxy: ETF Turnover		Phantom Shares Proxy: ETF Short Volume
Phantom Shares Proxy: Pre 2010	0.470		
	(1.347)		
Phantom Shares Proxy: Post 2010	2.001***		
	(5.037)		
Phantom Shares Proxy: Pre 2012		1.728	–1.460
		(0.988)	(–0.488)
Phantom Shares Proxy: Post 2012		4.170***	5.079***
		(5.104)	(3.696)
Observations	188,308	1,626	1,130
R-squared	0.764	0.501	0.568
Firm + Year FE	Yes	No	No
Industry + Year FE	No	Yes	Yes
Controls	Yes	Yes	Yes

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