# The Index-Fund Dilemma: An Empirical Study of the Lending-Voting Tradeoff

Edwin Hu, Joshua Mitts, Haley Sylvester*

December 2020

## Abstract

Institutional investors' role in shareholder voting is among the most hotly debated subjects in corporate governance. Some argue that institutions lack adequate incentives to effectively monitor managers; others contend that the largest institutions have developed analytical resources that produce informed votes. But little attention has been paid to the tradeoff these institutions face between voting their shares and earning profits—both for themselves and for the ultimate beneficiary of institutional funds—by lending those shares.

Using a unique dataset and a recent change in SEC rules as an empirical setting, we document a substantial increase in the degree to which large institutions lend shares rather than cast votes in corporate elections. We show that, after the SEC clarified funds' power to lend shares rather than vote them at shareholder meetings, institutions supplied 58% more shares for lending immediately prior to those meetings. The change is concentrated in stocks with high index fund ownership; a difference-in-differences approach shows that supply increases from 15.6% to 22.3% in those stocks. Even when it comes to proxy fights, we show, stocks with high index ownership see a marked increase in shares available for lending immediately prior to the meeting. Overall, we show that loosening the legal constraints on institutional share lending has had significant implications for how index funds balance the lending-voting tradeoff.

1

# 1 Introduction

The role of institutional investors in the governance of publicly traded firms is increasingly disputed: some argue that such institutions lack economic incentives to oversee corporate insiders,[1] while others argue that institutions have made substantial investments in monitoring the companies they own.[2] What is not disputed, however, is that the remarkable recent increase in the size and influence of institutional investors—especially index funds—has rendered their choices critical to the future of American corporate governance.[3] When determining whether and how to vote the significant stakes they control, these institutions must carefully weigh the (often-limited) benefits of voting against its costs,[4] including the opportunity costs to the fund and its investors of not lending the shares they own to other market participants.[5] Institutions strike that balance in the shadow of Securities and Exchange Commission (SEC) interpretations of the federal law governing a fund's fiduciary obligations to its investors. Despite a lengthy literature on the importance of institutional investors to the future of corporate governance, little attention has been paid to the law and economics of the lending-voting tradeoff these funds face.[6]

---

[1]See Bebchuk et al. (2017) and Bebchuk and Hirst (2019). For an earlier discussion of these issues, see Coffee (1991).

[2]Novick (2020). Appel et al. (2016).

[3]Coates (2018). Hirst and Bebchuk (2019). Bogle (2018).

[4]Coffee (1991)

[5]Securities lending—the practice of lending out for a fee shares that an entity beneficially owns—provides an opportunity for the funds to increase revenue. The demand for borrowing securities arises primarily from short sellers. A short seller typically borrows securities from a lender, immediately sells them, and later repurchases those securities and returns them back to the lender. If the price declines from the date of sale to the date of repurchase, the short seller profits by "selling high and buying low." The availability, costs, and risks associated with borrowing shares are critical factors in determining the profitability of a short position, as well as the duration that it may be held open.

[6]That tradeoff is influenced, of course, by the profit incentives of institutional investors. Most of these institutions are for-profit firms that profit from fees—with the notable exception of Vanguard.

In this Article, we provide novel evidence on the importance of the law governing the voting-lending tradeoff for institutional investors. We show that a recent change in SEC guidance[7] that gave funds more legal flexibility in making that tradeoff led to a substantial increase in the supply of shares.[8] In fact, we show that the SEC's new guidance increased the shares available for lending by some 58% on average.

An important legal implication of the SEC's new guidance is that it applies differently to index funds than to actively managed ones, who face less economic pressures to do share lending. Thus, we use stocks with low index-fund ownership as a baseline for assessing changes in lending supply. We employ a difference-in-differences design[9] to demonstrate that the SEC guidance dramatically increased share lending prior to corporate elections.[10] Moreover, we show that the increase in supply is not due to any simultaneous increase in demand i.e. from short sellers), which provides confidence in our conclusion that in light of the new guidance funds altered their behavior.

Because shares can be borrowed at-will from the lending agent or broker—and then voted by the ultimate holder as of the record date—shares put on loan do not carry voting instructions. Hence, shares made available for loan but not borrowed are not voted—making share lending a significant contributor to non-voting. By one estimate, in 2010 alone 60

---

[7]SEC, Commission Guidance Regarding Proxy Voting Responsibilities of Investment Advisers, Release Nos. IA-5325; IC-33605 (Aug. 21, 2019), available at `https://www.sec.gov/rules/interp/2019/ia-5325.pdf` (last accessed Jul. 1, 2020)

[8]We focus on share supply because funds have direct control over the quantity available for lending through their lending and recall policies. Therefore, any change in funds' behavior should be reflected in the share supply.

[9]We verify that parallel trends hold for passive versus active funds prior to the release of the SEC guidance and show that our results are robust to a variety of robustness specifications including matching and placebo tests. See Section 5.

[10]We show that the supply of loans for stocks with high index fund ownership increased from 15.6% on average to 22.3%. Then, in a sample of only proxy fights, we find that high index fund owned stocks see an increase in supply of 3.8% on average. See Section 5.

billion shares went unvoted, with 15 billion shares on loan.[11]

One implication of our findings is that more share lending may decrease voter turnout in contested corporate elections. After the SEC's new guidance, we find an average increase in share lending of almost seven percent of shares outstanding in proxy fights. Importantly, this seven percent likely comes from index funds which are usually reliable voters. Therefore, this 7% represents a meaningful proportion of potential support for a proposal.

To be sure, our study cannot conclusively determine whether institutions would collect lending fees rather than vote shares *when it matters*—*i.e.*, in those contested elections where the margin of victory is sufficiently close so that voting the shares on loan would have altered the outcome. Nonetheless, we think our results warrant attention for two reasons.

For one, any institution considering whether to recall shares on loan for voting faces a free-riding problem: the gains from enhanced governance are shared with all shareholders, while the cost of foregone lending revenues are borne by the institution recalling shares. There is a powerful incentive to hold out and hope that another institution will recall shares on loan instead. This incentive is all the more compelling when the likelihood of being the decisive vote is less than fully certain. Legal restrictions along with coordination costs make it difficult to solve this free-riding problem via side payments.[12]

Second, even if an institution were to overcome the free-riding problem, proponents will still face substantial *uncertainty* as to whether the turnout will be adequate to yield the desired outcome—just as the GameStop case illustrates. Because highly contested corporate

---

[11]That is why some proxy-plumbing advocates have pushed for lender-directed voting, which would provide voting instructions for all shares put on loan. See, *e.g.*, Center for the Study of Financial Market Evolution, Letter to Elizabeth Murphy, SEC (July 5, 2011), available at https://www.sec.gov/comments/df-title-ix/lending-borrowing/lendingborrowing-22.pdf.

[12]For example, two large Funds A and B cannot contract with one another where one fund continues lending while the other votes, or where both decide ex-ante a jointly optimal level of lending and voting.

4

elections do not occur very frequently, and a great deal is at stake, proponents are likely to be averse to this sort of risk and refrain from submitting proposals where the chance of institutions not recalling shares on loan is high. Efforts to minimize these risks are likely to be costly. For these reasons, the choice by index funds to lend rather than vote shares can introduce uncertainty that handicaps effective corporate governance.

Our findings contribute to longstanding literature on the institutional dynamics that explain index funds' role in corporate governance. In particular, our finding that legal constraints governing the lending-voting tradeoff meaningfully affect institutional behavior is consistent with the well-known prediction three decades ago that institutions prefer exit (lending) to voice (voting) (Black, 1991; Coffee, 1991). More recently, in parallel work one of us (Mitts, 2020) shows that share lending by passive index funds is *informationally sensitive*: while index funds cannot sell shares of underperforming firms directly, they can raise rates when lending to short sellers borrowing shares of those firms' stock. This work shows that research on the role of index investors in corporate governance should take careful account of the new institutional mechanics through which funds pursue the decades-old tradeoff between exit and voice.

We make no claim about the optimal tradeoff between lending and voting at institutional investors. We do, however, offer three contributions to the growing literature on institutional investors' role in corporate governance. First, we show that relaxing the legal constraints on share lending produced an immediate and substantial increase in share lending, consistent with concerns that institutional investors lack incentives to engage in corporate oversight. Second, we argue existing disclosure of funds' share-lending activity is inadequate. Finally, our evidence shows that lawmakers considering new rules governing how institutions balance lending profits and voting should not assess those rules, as the SEC did, as a narrow question

5

of investment-company law. Instead, any such rules should take account of the broader corporate-governance implications of the lending-voting tradeoff.

# 2 Institutional Investors and Shareholder Voting

In September 2019, the assets under management in passive funds grew larger than the assets under management in active funds for the first time in history (Lim, 2019). That trend has been celebrated as reducing managing fees for ordinary investors[13] while simultaneously generating concern that these funds will not engage in stewardship.[14] Because institutional funds now control a substantial proportion of voting shares at U.S. public companies, their decisions as to how, and whether, to vote those shares will have significant consequences for corporate governance.[15] Thus, we begin with an analysis of institutional investors' incentives to engage in oversight.

## 2.1 Incentives of Passive Investors

It is well-understood that institutional investors have little incentive to engage in oversight of the companies they own.[16] Passive investors bear large costs of stewardship but—because expense ratios are so small—only capture a small fraction of the benefits of improved corporate governance.[17] Therefore, passive investors have little incentive to participate actively in

---

[13]Malkiel (2013).

[14]Bebchuk and Hirst (2019); Bebchuk et al. (2017).

[15]Coates (2018); Hirst and Bebchuk (2019).

[16]Black (1991); Coffee (1991).

[17]By contrast, investment managers directly benefit by collecting securities lending fees from lending their shares—and are under no legal obligation to share these fees with beneficial owners.

6

stewardship even if doing so would maximize shareholder value.[18] As recent scholarship has emphasized, that is especially true of passive investment funds, where competitive pressures have reduced management fees.[19]

Exacerbating this problem is an agency conflict between institutional investors and the beneficial owners whose money they manage. When an investment fund reduces costs by rationally engaging in less corporate oversight, not all of those savings are necessarily returned to beneficial owners; instead, some may be retained by the fund's managers.[20] In fact, according to a recent MorningStar analysis, BlackRock passes only 70% of their securities lending revenues back to the fund (MorningStar, 2018).[21] As a result, institutions like

---

[18]Some argue that a portion of the fees collected on the lending of otherwise idle shares is passed on to investors in the form of reducing tracking error shortfalls. This would indeed be good for investors but is difficult to verify as the disclosure regime surrounding security lending is convoluted and incomplete. It could also be that much of the revenue from the securities lending fees goes instead to the fund's parent company. In other words, while these fees might be used to offset high expense ratios, to the extent that a passive funds' benchmark is easy to track (implying a low expense ratio to begin with), and tracking error is small, investment managers can expect to capture a significant fraction of securities lending fees. And to the extent that managers, and not retail investors, benefit from securities lending revenues, share lending could present a conflict of interest when it comes time to vote shares on behalf of clients. But an even more insidious conflict exists: the fund both makes the voting decision and sets the pass through rate, meaning the fund can decide that a client's best interest is served by not voting shares and instead making some percentage of the share lending fees—the remainder of which stay with the fund.

[19]Bebchuk and Hirst (2019); Bebchuk et al. (2017)
At one time, management fees provided a large return to the company, because most of the funds were active and therefore charged high fees for their expertise in picking stocks. But over the past few decades, passive funds have been increasing in popularity and, as a result, assets under management. Passive funds generally have low fees because they track the market instead of picking stocks to outperform the market—and competition in this growing space has put downward pressure on the fees. It is natural for institutional investors to look for other sources of revenue for passive funds.

[20]Morley (2013).
To be sure, these cost savings or revenue increases would be fully passed through to the underlying investors in perfectly competitive markets. In reality, these markets are far from perfectly competitive. Moreover, the exclusive lending agents used by these institutions are often affiliated with the institutions themselves, introducing yet another conflict.

[21]To be sure, funds have different incentives to lend securities versus vote. The degree to which profits from securities lending are returned to investors may turn on the structure and governance of the fund itself. This means there could be heterogeneity among the funds' fees practices. For example, BlackRock Advisors is a publicly traded company with underlying shareholders—and the accompanying fiduciary duties owed to

7

BlackRock have powerful private incentives to minimize the costs of corporate oversight and maximize the benefits from share lending.[22]

## 2.2  Collective Action Problems

Shareholder voting also suffers from three classes of collective action problems. The first is the classic "paradox of voting." Because shareholders do not act as a unit, for most rational shareholders (and for their beneficial owners) the costs of voting will often exceed the benefits. Consider the following choice faced by an institutional investor: If the investor votes the shares in an upcoming contested election, there is only a small chance that that vote will tilt the scales in favor of corporate change that would enhance firm value—a gain of which the investor only receives a fraction in any event. That same investor will, however, almost certainly forego lending fees by choosing to vote rather than lend. Pitting an uncertain gain against a virtually certain loss means that most institutional investors will rationally prefer lending over voting.

Second, smaller institutions may attempt to "free-ride" off of the stewardship activities of others. Because all investors benefit from value-enhancing stewardship activities, there is little incentive for smaller institutions to engage in stewardship if they can rely upon larger institutions to make the necessary investments (*e.g.*, research, engagement, voting, etc.).[23]

---

them. This structure could incentivize BlackRock to pass less of the securities lending revenue to the funds in order to make more profit for itself and its shareholders. Vanguard, on the other hand, is fully member-owned and has no public shareholders. Vanguard, therefore, has few incentives not to return securities lending revenues to the funds, because they have no underlying owners and shareholders demanding higher returns.

[22]A working paper by Travis Johnson and Gregory Weitzner, drawing on data gathered after the SEC's updated disclosure rules for securities lending were finalized in 2016, confirms this general tendency: higher securities lending fee retention correlates with lower expense ratios (Johnson and Weitzner, 2019).

[23]See, *e.g.*, Spatt, Chester, Chief Economist and Director, Office of Economic Analysis, SEC, "Shareholder Voting and Corporate Governance: Economic Perspectives," available at `https://www.sec.gov/`

Hence, such "free-riders" will rationally prefer to lend rather than vote.

Third, even large institutions that in expectation know they will be pivotal if they co-operate with each other can still fail to do so. [24] This problem is commonly known as the "stag hunt" variation on the classic prisoner's dilemma. In such a setup, two large institutions can cooperate and forgo lending fees to cast pivotal votes and achieve a Pareto optimal outcome. However, if one institution decides instead to lend rather than vote, the effort will fail. Hence, both institutions may rationally prefer to lend rather than vote and earn certain lending fees despite achieving a sub-optimal outcome from a social welfare perspective.

Given the private incentives of the funds, and these coordination challenges, we would expect to see under-voting absent external constraints on lending or external incentives to vote.

# 3    Fiduciary Duty as a Lending Constraint

Federal law constrains institutional investors' share-lending activities in two ways: first, the fund's board has a fiduciary obligation to cast votes in material corporate elections, and second, the investment adviser has a general obligation to act in her client's best interests. As explained below, until recently, decades of informal lawmaking at the SEC required institutions to engage in careful balancing of investor interests before lending shares.

---

news/speech/2007/spch042007css.htm.

[24]Of course, large institutions cannot actually coordinate votes because of Rule 13D. In this analysis, we are using "coordinate" as a term of art.

Electronic copy available at: https://ssrn.com/abstract=3673531

## 3.1 Federal Law Restraining Share Lending

The obligation of an investment fund's board to cast votes in corporate elections is derived from the Investment Company Act of 1940 (ICA), which governs the custody of securities held on behalf of fund shareholders.[25] In 1971, the SEC made clear that the ICA would not be read to prohibit share-lending programs so long as such programs met certain conditions[26]— including the condition that the fund retain voting rights on lent securities. To address that

---

[25]Specifically, section 17(f)(1) of the Investment Company Act of 1940 (ICA) provides that "[e]very registered management company shall place and maintain its securities and similar investments in the custody" of a bank or other authorized custodian, and gives the SEC broad rulemaking power. 15 U.S.C. 80a-17(f)(1). The SEC subsequently promulgated Rule 17(f)-2(b), which provides, "Except as provided in paragraph (c) of this section, all such securities and similar investments shall be deposited in the safekeeping of, or in a vault or other depository maintained by, a bank or other company whose functions and physical facilities are supervised by Federal or State authority." 17 CFR § 270.17f-2(b).

Without the carveout for paragraph (c), Rule 17(f)-2(b) would preclude transferring shares held by a registered management company to any third party, including in a lending transaction, because the shares would no longer be "deposited in the safekeeping of, or in a vault or other depository." However, paragraph (c) provides: "The first sentence of paragraph (b) of this section shall not apply to securities on loan which are collateralized to the extent of their full market value, or to securities hypothecated, pledged, or placed in escrow for the account of such investment company in connection with a loan or other transaction authorized by specific resolution of its board of directors." 17 CFR § 270.17f-2(c).

[26]Rule 17-f(2)(c) allows mutual funds to lend shares so long as the shares are collateralized to the extent of their full market value. The intent behind the collateral requirement is to ensure that investors are made whole in the event of default by the borrower. In a series of no-action letters, the SEC identified several additional conditions which must be met in order for a share lending program to comply with the ICA. On November 3, 1971, the SEC's Office of Chief Counsel wrote to State Street Bank and Trust Company:

> We have not interpreted the Investment Company Act of 1940 to prohibit a mutual fund from lending its portfolio securities provided that (1) the fund receives 100 percent cash collateral from the borrower; (2) the borrower adds to such collateral whenever the price of the securities rises (i.e., mark to market on a daily basis); (3) the fund may terminate the loan at any time; (4) the fund receives reasonable interest on such a loan, any dividends, interest or other distributions on the loaned securities, and any increase in the market value of such securities; (5) the fund is not required to pay any service, placement or other fees in connection with such a loan; and (6) the fund retains voting rights on the loaned securities.

Letter from Richard J. Delmar, Vice President, State Street Bank and Trust Company, to Alan Rosenblatt, Chief Counsel, SEC (Nov. 3, 1971) (on file with SEC), available at https://www.sec.gov/divisions/investment/noaction/1972/statestreet052272.pdf (last accessed Jul. 1, 2020). These conditions prompted a series of additional no-action letters in the 1970s and 1980s, which sought relief for newer practices emerging in the securities lending industry.

10

condition, the Salomon Brothers investment bank proposed a solution which is still in use today: allowing the fund to recall lent securities for voting at any time.[27] The SEC Staff approved Salomon's proposal but warned that their stance did *"not relieve the directors of a fund of their fiduciary obligation to vote proxies. If the fund management has knowledge that a material event will occur affecting an investment on loan, the directors would be obligated to call such loan in time to vote the proxies."*[28]

The Investment Advisers Act of 1940 (IAA) also imposes fiduciary duties of care and loyalty with respect to voting shares. While the ICA has long been understood to require advisers to monitor corporate events and vote; the IAA requires that such votes be cast in the best interest of the client. For decades, funds understood these obligations to require voting on important ballots[29]—for example, on proposed mergers or in contested proxy fights—and in 2003 the SEC formally recognized those obligations in rulemaking.[30] Although the SEC Staff updated that view in 2014 to provide funds with marginally more flexibility, the prevailing view among most practitioners was that federal fiduciary obligations required

---

[27]Letter from Donald M. Feuerstein, Counsel, Salomon Brothers, to Alan Rosenblat, Chief Counsel, SEC, (Apr. 12, 1972) (on file with SEC), available at `https://www.sec.gov/divisions/investment/noaction/1972/salomonbrothers052372.pdf` (last accessed Jul. 1, 2020).

[28]Response from Alan Rosenblatt, Chief Counsel, SEC, to Donald M. Feuerstein, Counsel, Salomon Brothers (May 23, 1972) (on file with SEC), available at `https://www.sec.gov/divisions/investment/noaction/1972/salomonbrothers052372.pdf` (last accessed Jul. 1, 2020).

[29]This understanding grew from a series of SEC Staff No Action Letters setting some basic principles for share lending and voting policies. These No Action Letters are available on the SEC's website at `https://www.sec.gov/divisions/investment/securities-lending-open-closed-end-investment-companies.htm`.

[30]The SEC established that Rule 206(4)-6 under the IAA requires an investment adviser who exercises voting authority with respect to client securities to adopt and implement written policies and procedures that are reasonably designed to ensure that the investment adviser votes proxies in the best interest of its clients. The SEC further recognized that shareholder voting falls within the scope of the fiduciary duties of an investment adviser—and amended the rule to include language addressing the investment adviser's fiduciary obligation to clients when the adviser has authority to vote their proxies. SEC, Proxy Voting by Investment Advisors, Investment Advisors Act Release No. 2106, 17 C.F.R. §§ 275 (Jan. 31, 2003), available at `https://www.sec.gov/rules/final/ia-2106.htm` (last accessed Jul. 1, 2020).

funds to be able to recall shares to cast important votes on behalf of investors.[31]

## 3.2  Relaxing Legal Constraints on Share Lending

In August 2019 the SEC issued, for the first time, Commission-level guidance on advisers' fiduciary duties regarding voting.[32] The new guidance relaxed decades-old constraints imposed on institutional investors by previous Staff judgments regarding share lending.

First, the guidance specified that an institution may choose not to vote a client's shares if, in the institution's judgment, refraining from voting is in the client's "best interest."[33] Second, and more importantly for our purposes, the SEC specifically identified fees from share lending as an approved basis for declining to vote:

> [An institution may choose not to] exercise voting authority in circumstances under which voting would impose costs on the client, *such as opportunity costs for the client resulting from restricting the use of securities for lending in order*

---

[31]In 2014, the Divisions of Investment Management and Corporation Finance issued Staff Legal Bulletin No. 20 and highlighted the inherent flexibility of the client-adviser relationship. The SEC asserted that whether an adviser votes every proxy on behalf of his client is contingent on an agreement between the two parties, such that voting frequency can be tailored based on the client's needs and best interest. SEC, Proxy Voting: Proxy Voting Responsibilities of Investment Advisers and Availability of Exemptions from the Proxy Rules for Proxy Advisory Firms, STAFF LEGAL BULLETIN NO. 20 (June 30, 2014), available at `https://www.sec.gov/interps/legal/cfslb20.htm` (last accessed Jul. 1, 2020). See also Davis Polk, SEC Guidance on Use of Proxy Advisory Firms for Voting Proxies (Jul. 1, 2014), available at `https://www.davispolk.com/files/07.01.14.SEC_.Guidance.on_.Use_.of_.Proxy_.Advisory.Firms_.for_.Voting.Proxies.pdf` (last accessed Aug. 11, 2020).

[32]SEC, Commission Guidance Regarding Proxy Voting Responsibilities of Investment Advisers, Release Nos. IA-5325; IC-33605 (Aug. 21, 2019), available at `https://www.sec.gov/rules/interp/2019/ia-5325.pdf` (last accessed Jul. 1, 2020).

[33]However, the term "best interest" was defined nowhere in the guidance (nor in the prior rule adopting the standard, see SEC, Commission Interpretation Regarding Standard of Conduct for Investment Advisers, Release No. IA-5248 (June 5, 2019), 84 FR 33669, available at `https://www.sec.gov/rules/interp/2019/ia-5248.pdf` (last accessed Jul. 1, 2020)), leaving institutions to interpret the term and determine when it would require them to vote instead of lend their shares. With no definition, individual investors have little recourse to challenge the institution's interpretation.

*to preserve the right to vote.*"[34]

Reversing the position the Staff took with Salomon Brothers in 1972, this language made clear that an institution's federal fiduciary obligations to its clients did not require the recall of lent shares for purposes of voting if doing so would impose "opportunity costs" on the client, *i.e.*, the loss of securities lending revenues.[35] In this paper, we study the empirical implications of this shift for institutions' share-lending activities. In particular, in light of the Commission's emphasis on the opportunity costs of voting, we consider the heterogeneity of the effects of this legal change as between companies with significant proportions of passive ownership—funds for whom the opportunity costs of voting are especially high—and those with comparatively high proportions of active-fund ownership.[36]

# 4 Data and Summary Statistics

We obtain securities lending data from FIS Astec Analytics,[37] which reports daily securities lending positions and loan availability for over 45,000 global fixed income and equity secu-

---

[34]SEC, Commission Interpretation Regarding Standard of Conduct for Investment Advisers, Release No. IA-5248 (June 5, 2019), 84 FR 33669, available at `https://www.sec.gov/rules/interp/2019/ia-5248.pdf` (last accessed Jul. 1, 2020).

[35]At the time this guidance was released, Commissioner Jackson both noted his concern about the guidance's potential implications and argued that the Commission's release did not fully consider its economic implications. See Commissioner Robert J. Jackson Jr., Statement on Proxy-Advisor Guidance (Aug. 21, 2019), available at `https://www.sec.gov/news/public-statement/statement-jackson-082119` (last accessed Jul. 1, 2020).

[36]Passive funds may be particularly motivated to lend because, unlike active funds which are more highly compensated for stock-picking activities, passive funds receive low management fees. In an ideal world, we would have direct data on share lending by fund instead of aggregated data on share lending by stock. This would allow us to identify exactly the effect of the guidance on index funds separate from other funds. Absent such data, we infer the effect using regression techniques described in Section 5.

[37]The data are licensed and provided by Quandl, which offers an academic subscription at `https://www.quandl.com/databases/SLD`.

rities. The data begin in mid-2013 and extend to 2020, with increasing coverage of more securities over time. For each security and trading date, we observe a series of aggregate statistics that FIS obtains from lending agents as to both share borrowers and lenders.[38]

On the borrower side, FIS obtains the volume of outstanding shares on loan as of a given date, the volume of new shares borrowed that date, and the volume of shares returned that date. In addition, for each of these categories—outstanding, new, returned loans—FIS reports the mean, standard deviation, minimum, and maximum "intrinsic rate" paid by short seller-borrowers on a given date. The intrinsic rate is the effective interest rate paid by a borrower across both cash and non-cash collateral loans—the rate is "a blended weighted average of (a) fees on non-cash loans and (b) spreads between rebate rates on cash loans and the prevailing overnight interest rate for the currency."[39] On the lender side, FIS obtains the total volume of shares made available for borrowing by institutional investors in their securities lending programs (referred to as "available" shares), as well as the volume of shares reported by lenders as out on borrow (referred to as "utilized" shares).

We collect record dates from ISS Voting Analytics from 2017 through the end of 2019, and supplement this data with 2020 data by scraped and hand-collected record dates found in definitive proxy statements.[40] We also collect data on whether the election contains a

---

[38]FIS does not release granular details about its coverage of the securities lending market, other than the "major global custodians and banks in the securities lending market." Securities Lending Data "Product Overview" (Aug. 11, 2020), available at `https://www.quandl.com/databases/SLD/documentation`. As FIS advertises its intraday data to hedge funds and other investment management professionals, there is no reason to think that the data are systematically missing certain borrowers or lenders. FIS, "FIS AStec Lending Pit" (Aug. 11, 2020), available at `https://www.fisglobal.com/en-sg/capital-markets-solutions/investment-banking-and-brokerage/securities-finance/fis-astec-analytics`. Nonetheless, the absence of certain borrowers or lenders is unlikely to bias our empirical analysis, which examines trends within the available universe of borrowers and lenders within the FIS dataset.

[39]Securities Lending Data "Product Overview" (Aug. 11, 2020) available at `https://www.quandl.com/databases/SLD/documentation`

[40]Specifically, we focus on DEF 14A, DEFC14A, and DEFM14A filings on the SEC's EDGAR system.

proxy fight, using data from SharkRepellant. For each firm-election, we collect the number of shares on loan and the loan rate in the ten days prior to the record date for voting by passive and all other mutual funds. We compute measures of the supply of lendable shares as a percentage of shares outstanding, the percent of shares on loan, the utilization ratio (shares on loan divided by lendable shares), as well as the average loan rate or cost to borrow.

As in Mitts (2020), we classify a mutual fund as passive if it exclusively replicates an index and leaves the fund manager no discretion to purchase or sell securities not included in the index.[41] Our data on institutional and fund ownership comes from Thomson Reuters and the CRSP mutual fund database, respectively. For each issuer we compute measures of quarterly institutional ownership, mutual fund ownership, and passive ownership, as well as the concentration of institutional ownership. We define a stock as having high index ownership if it has above-median index ownership in any given quarter. We also compute the average share-weighted mutual fund expense ratio across all funds that hold a given stock. Because some of our data is only updated on an annual basis, for each firm-election, we use institutional and mutual fund ownership reported on a six month lag to ensure that we have sufficient data for our full post-guidance sample.[42]

Summary statistics of the data are shown in Table 1 for our pre-guidance and post-guidance sample. The average issuer in both our pre- and post-guidance samples has similar

---

We used regular expressions to extract the dates in long form within one hundred characters of the term "record date" across multiple lines. We were able to obtain the vast majority of disclosed record dates. For those that we were unable to scrape, if for example the filing was an image and not text, we hand-collected the record dates.

[41]Our results are consistent when following Appel et al. (2016), which measure those funds which are linked to an index in some way (even if there is managerial discretion). In addition, we check the names of the funds for index or ETF designations using regular expressions and count these as index funds.

[42]While Thomson and CRSP mutual fund data is updated on a quarterly basis, the MFLINKS database, which we use to merge the two, is only updated annually.

levels of institutional ownership (50–60%), ownership concentration (12–13%), and index ownership (34–42%). For the average issuer in our pre-guidance sample, over the thirty days surrounding the record date, the supply of lendable shares as a percentage of total shares outstanding is about 10.3%. By contrast, in our post-guidance sample the average supply is 16.3%, representing an increase of nearly 60%. The percentage of shares actually on loan is about the same at around 1.5%. The average share utilization drops from about 18.7% to 12.7%. The average cost of borrowing or retail average loan rate is 9% in our pre-guidance sample and 6% in our post-guidance sample. Therefore, it appears that the demand for share lending remains about the same across both samples on average, and the increase in loan supply may have decreased the cost of borrowing on average. The average expense ratio across index funds holding the stock of the average issuer drops from 0.53% to 0.35% between our pre- and post-guidance samples. We verify that this change is due to a long-term trend of declining fund expense ratios and does not confound our estimates of the effects of the guidance on share lending.[43]

# 5   Analysis and Results

## 5.1   Descriptive Results

To motivate our empirical analysis we consider a recent high-profile example: the 2020 proxy fight at GameStop, a publicly traded gaming company at which BlackRock, Fidelity, Vanguard, and State Street owned 43.57%.[44] As the *Wall Street Journal* reported at the time,

---

[43]See Appendix C.

[44]Gamestop, "Ownership Summary" (Aug. 11 2020), available at `http://news.gamestop.com/stock-information/institutional-ownership`.

a closely contested election left both the company and its activist challengers scrambling: neither could identify how the largest institutions' shares were voted (Lim, 2020). Figure 1 offers an explanation, plotting the average supply of shares and shares on loan for GameStop in our pre- and post-guidance samples. Before 2020, 17% of GameStop shares were available for lending, but in that year the supply jumped to nearly 40% of the company's shares.[45]

We consider the generalizability of this result in our broader sample in Figure 2, which shows the average supply of lendable shares around record dates in event time for our pre-guidance sample in Panel (a) and post-guidance sample in Panel (b). In each Panel we split the sample into high and low index ownership stocks. Each estimate is based on a regression of the supply of shares on an indicator for the event date ($t$) and standard errors are calculated with firm-level clustering. We highlight three patterns in these figures. First, stocks with high index ownership tend to have a higher supply of loans in both samples. Second, in our post-guidance sample, the supply of shares increases more for our high index fund owned stocks than for stocks with low index fund ownership: the average supply of shares increases from just above 15% to above 20% for stocks with high index fund ownership.[46]

Therefore, although we see a 6% increase in share lending on average in Table 1, these figures show that a significant portion of the increase comes from stocks held by index funds. Finally, we find some evidence that the supply of shares decreases in the ten days prior to the record date consistent with share recall, as studied in Aggarwal et al. (2015). This is most

---

[45]The GameStop case is a good example of where individually rational behavior can lead to suboptimal outcomes. The two activists on the ballot in June had been on the ballot previously. In prior years, the institutional investors holding GameStop's stock had opposed these candidates. And seeing as the candidates are seeking to cut costs and repurchase shares, the institutions likely determined that these candidates would not create value for the firm in the long term. But this year, the institutions did not show up to vote—and the activist's candidates won.

[46]By contrast, for stocks with low index-fund ownership the supply of shares increases from just below 7.5% to just above 7.5%.

17

apparent for the pre-guidance high index fund ownership sample. However, this pattern does not exist in the post-guidance high index fund ownership sample.

These results are descriptively consistent with index fund incentives playing a role in the supply of shares but are not definitive: differences in share-lending supply may be related to factors other than index ownership. We seek to identify plausible estimates of the effect of the guidance on the supply of shares. Therefore, we rely on difference-in-differences regressions of the form:

$$Supply_{i,t,j} = \beta_0 Treat \times Post + \beta_1 Treat + \beta_2 Post + \beta_3 X_{i,t,j} + \mu_{i,j} + \varepsilon_{i,t,j}, \qquad (1)$$

where $Supply$ is the percentage supply of lendable shares for stock $i$ on day $t$ in period $j$, $Treat$ is an indicator for our treatment group of stocks with above-median index fund ownership, $Post$ is an indicator for the periods after the August 2019 SEC guidance, $X$ is a vector of controls.[47] We also include fixed effects $\mu_{i,j}$ for the stock $i$, or period $j$ depending on the specification. Therefore, the regression estimate $\beta_0$ captures the average increase in share lending supply between stocks with high and low index-fund ownership after the SEC guidance. Of course stocks have both index and non-index fund ownership. To the extent that non-index funds increase share lending during the same period, this would bias our estimates of the supply increase by index funds towards zero. Hence our estimate is a conservative estimate.

---

[47]We control for institutional ownership, ownership concentration, the average retail loan rate, shares on loan, the passive fund ownership, the average expense ratio across index funds that hold stock $i$, and whether the meeting is a proxy fight.

18

## 5.2 Difference-in-Differences Design Validity

The use of difference-in-differences regressions relies on several assumptions, which we discuss and validate now. Because we do not have random assignment into treatment and control groups it is natural to wonder whether differences in the supply of loans are due to characteristics other than index fund ownership and the change in guidance. To mitigate these concerns, we begin by comparing our pre-guidance samples and conduct coarsened exact matching and weighting to identify a matched subsample where we are confident that differences in supply are due to differences in index ownership (Iacus et al., 2012).

Table 2 presents the covariate balance estimates in our full and matched pre-guidance samples. In our full sample we have 1,438 control stocks and 1,454 treated stocks. Panel (a) shows that there are several important differences across our treated and control samples. As with Figure 2, the supply of shares is much higher in our treated, or high index ownership, group than in our control, or low index ownership, group. The treatment group stocks also have higher institutional ownership overall, have much lower ownership concentration, are larger on average, and have significantly lower costs of borrowing. We quantify these differences using standardized mean differences, where the standard deviation is estimated over the pre-guidance high index ownership sample. For example, one of the largest differences between the treatment and control group is the average loan rate. The average cost to borrow a treatment stock is 1%, versus 12% for the average control stock, which represents a difference of 3.8 standard deviations. This makes intuitive sense as stocks with low index ownership have much lower supply of lendable shares but similar demand for borrowing (as measured by the shares on loan). Low index ownership stocks also have about 2.4 standard deviations lower institutional ownership overall, and 4.7 standard deviations higher ownership concentration, which raises concerns about how comparable the markets for lending

19

these securities are empirically.

Panel (b) presents the covariate balance estimates from our matched subsample constructed using coarsened exact matching and weighting. In our matched sample we have 117 control stocks and 137 treated stocks. In our matched sample, supply, demand, cost of borrowing, institutional ownership, ownership concentration, and the average expense ratio are all well balanced.[48] The only remaining difference is the 1.5 standard deviation difference in index ownership, which we do not match on.

Figure 3 plots the average supply of shares in the ten days prior to the record date for our treated and control group stocks from our matched sample in calendar time, controlling for variation in institutional ownership over time—which, all things equal, is a principal determinant of the supply of lendable shares.[49] In Figure 3, the treatment group is denoted in green, the control in purple, and the post-guidance observations are indicated with dashed lines, with a vertical dashed line for the 2019 SEC guidance. Three features of the data stand out. First, there is a trend of increasing share lending over our sample, which picks up in mid-2018. Second, and importantly, this trend appears to be similar for both our high and low index ownership stocks prior to the August 2019 guidance. Third, after the guidance we see a dramatic increase in the supply of loans for the high index ownership stocks, with no such increase for the low index ownership stocks. Specifically, the average supply of shares for the high passive ownership group, controlling for variation in institutional ownership, increases dramatically from around 13.5% to around 20%. By contrast, the supply of shares for low index ownership stocks increases from 10.5% to 13.2% in our matched sample. Hence,

---

[48]Many empirical researchers utilize a standardized mean difference threshold of 0.2 or 0.1 as a threshold for satisfactory matching (e.g., Stuart, 2010).

[49]Curious readers may refer to Figure A1 for the full sample equivalent plot. The full sample plot shows some cyclicality in the high index fund share supply which appears to diverge in late 2018, which we address using placebo tests in Appendix A.

the magnitude of the difference in means for our high passive ownership stocks is more than double that of the low passive ownership stocks.

## 5.3   Difference-in-Differences Results

Having established the plausibility of our difference-in-differences design we return to the regression specification presented in Equation 1. The main estimate that we are focused on is the interaction term, $Treat \times Post$, which provides the difference-in-differences estimate—that is, the increase in the mean supply of shares for the high index ownership group, compared to the pre-guidance mean, minus the analogous increase in means for the low index ownership group. Table 3 presents six regression estimates, using different regression specifications and samples.

Table 3 Column (1) presents regression estimates using the full sample, with no other controls, fixed effects, or matching. Under this specification, the average supply of shares is 6.6%, and high index ownership stocks have 9% higher or 15.6% average supply in the pre-guidance period. After the guidance, the low index ownership stocks see an average increase in supply of 1.3%. The high index ownership group sees a further 5.4% increase in share supply. Hence, after the guidance the supply of shares increases by, on average 42%, from 15.6% to 22.3%. All estimates are statistically significant at the one percent level, after clustering standard errors by firm.

Column (2) shows that these increases in share supply are not driven by changes in institutional ownership, ownership concentration, the average retail loan rate, shares on loan, the passive fund ownership, the average expense ratio, or by proxy fights. However, conditioning on all of these characteristics decreases the baseline difference in share supply

21

between high and low index owned stocks.[50]

Column (3) includes firm fixed effects, which has the effect of absorbing time-invariant firm-specific determinants of share supply and our control variables. Therefore, the point estimates have the interpretation of the average of the increases in share supply on a firm-specific basis. This estimate is more conservative, and shows that for the average firm, the increase in share supply after the guidance is just under 3.7%, but that remains statistically significant at the one percent level after clustering standard errors by firm.

Column (4) adds year-month fixed effects which absorb common variation within a given year-month, including our post-guidance point estimate. Such calendar time variation is apparent in Figure 3, in the form of the increase in share supply beginning in mid-2018. Having absorbed other calendar time variation in our sample, our difference-in-differences estimate increases to 4.2%.

Because most meeting items are routine, an increase in lending may not reflect a change in lending policy due to the guidance itself. It is clear, however, that lending rather than voting at meetings with material items—such as proxy fights—is a decision directly affected by the guidance.[51] Therefore, Column (5) repeats the specification in Column (4), using only the sample of proxy fights. Column (5) shows that even in our sample of proxy fights, after the guidance the supply of loans increases by 3.8%.

Column (6) reports estimates using our matched sample. Matching restricts our sample to a set of stocks that are—except for index ownership—similar to one another on average prior to the guidance. This specification trades sample size for higher internal validity. As a

---

[50]In Column (1) this difference is 9% on average. After including controls this difference is reduced to -0.24%, which is statistically indistinguishable from zero.

[51]Under the previous SEC Staff guidance, institutions were required to have a recall policy when there were material items on the ballot. See Section 3.

result the difference-in-difference estimate is the most conservative, at just above 3%.

Taken together the range of estimates in Table 3 show that the supply of shares increases dramatically after the SEC's 2019 guidance for stocks with high index fund ownership, relative to stocks with low index fund ownership. We interpret these results as suggesting that the relaxation of legal constraints on share lending in contested corporate elections changed institutional investors' practices. For the typical stock in our sample, which has around 116 million shares outstanding, our highest estimate implies that there are an additional 6.3 million shares available to borrow from index funds after the SEC's 2019 guidance. Thus, we show, changes in the law governing share lending have produced economically significant changes in institutional-investor behavior—at a time when those institutions play an increasingly important role in corporate governance.[52]

# 6    Discussion and Conclusion

As we have explained, index funds have significant incentives to lend rather than vote their shares. And as we have shown, the SEC's 2019 guidance has led passive funds to engage in more share lending—and less voting. In this Section, we briefly discuss two ways in which the guidance may have created or exacerbated conflicts of interest between funds and their beneficiaries.

---

[52]Although the absence of a simultaneous increase in demand for borrowing shares gives us comfort that the new guidance, rather than contemporaneous changes in market conditions, produced the results we observe, it might be argued that the lack of an economically significant increase in actual share borrowing suggests that the implications of the legal change are relatively narrow. However, we believe the economically and statistically significant increases in supply we identify here provide evidence of a substantial shift in the market for share lending and, hence, a potentially significant change in the availability of such shares for purposes of voting. Future work, however, should examine the degree to which the change we identify allows for increased levels of share borrowing and how such borrowing affects voting outcomes at public companies. As of this writing we do not have enough instances of proxy fights with high short interest—such as in the GameStop example—to be able to fully study this question.

First, rather than clarify a fund's fiduciary duty, we argue the SEC guidance exacerbated incentive problems by loosening the requirement to vote. Although the SEC stated that a fund could lend instead of vote its shares even if it was aware of a material ballot item, it did not clarify to what extent this is permissible. For example, it seems clear under the guidance that a fund could vote just enough shares to secure an outcome in the interest of its beneficiaries and lend the remainder. However, the exact amount of votes needed to secure an outcome is highly uncertain—and now most funds can claim a defense of opportunity costs if challenged about their failure to vote when an election goes the other way (contrary to beneficiaries' interests).

Second, while some funds clearly benefit from an increase in share lending, this increase creates uncertainty and shareholders will likely bear the cost. Share lending by index funds in particular significantly reduces turnout from an otherwise reliable voting bloc. Thus we can expect more close votes, where management will have to expend efforts to round up additional votes on their behalf.[53] And on the other side, activists will also incur additional costs rallying voters and may have to rely on "share recall campaigns" to ensure that their supporters turn out.[54] Either way, the increase in share lending leaves shareholders to pay

---

[53]Kahan and Rock (2007) call out one such cost which they call the "securities lending surprise" pathology—in which securities lending may have the effect of transferring votes from institutional investors to less engaged and informed investors. Institutional investors also play a significant gatekeeping role for activist investors, helping select those with value-enhancing proposals (Gilson and Gordon, 2013); to the degree those institutional investors do not vote, their ability to serve this function may be impaired. Activists also benefit from negotiating with large, reliable, institutional voters—hence increased share lending may increase the costs of activism (Brav et al., 2018). One place where increased share lending may actually lower costs is for borrowers who are likely to engage in so-called "empty voting"(Hu and Black, 2005)—that is, voting activity by investors with economic incentives to engage in value-destroying activity. Of course, this would increase costs on the proxy system as a whole.

[54]See, e.g., Cannae Holdings, Letter for Shareholders, "Cannae Holdings and Senator Investment Group Remind Shareholders to Recall Shares on Loan by September 18th Record Date" (Sept. 10, 2020), available at `https://www.businesswire.com/news/home/20200910005621/en/` ("We remind shareholders that, to the extent that they have loaned out or pledged any of their shares of CoreLogic Common Stock, they should contact their prime broker(s) to instruct them to immediately recall those shares. Any shares not recalled

Electronic copy available at: https://ssrn.com/abstract=3673531

for the increased costs of uncertainty.[55]

One incremental policy response to mitigate these conflicts could be an enhanced disclosure regime. The natural place to address the current disclosure gap is in Form N-PX, which was created in 2003 as part of a larger rulemaking focused on disclosure of proxy voting and has not been modernized in nearly two decades.[56] In particular, disclosure regarding the number of shares a fund voted, as compared to the number it lent, for each corporate election would be beneficial for two reasons. For one, such disclosure would help investors distinguish between share lending practices of different institutions in light of those institutions' varying financial incentives to maximize share-lending revenue. For another, this transparency would help investors focused on large institutions' claims of active stewardship hold those institutions accountable for the actual degree of voting undertaken by those funds. Notwithstanding well-advertised representations by many institutions that they actively engage in stewardship activity, our evidence shows that funds, at the SEC's invitation, now frequently choose lending profits over stewardship. At a minimum, institutions should be required to disclose that decision to the investors whose money they manage.[57]

---

by the September 18th record date will be unable to be voted at the Special Meeting.").

[55]Indeed, in submitting its securities-lending code to the Commission in 2009, the International Corporate Governance Network cited "concern that lending activity had become so important that it was impeding share voting, and interfering with corporate governance engagements generally."

[56]The SEC has recently expressed interest in providing such disclosure in Form N-PX. We hope that our findings will help the Commission design such disclosures. SEC, Final Rule: Disclosure of Proxy Voting Policies and Proxy Voting Records by Registered Management Investment Companies, 17 CFR Parts 239, 249, 270, and 274 (April 14, 2003). See also, Reporting of Proxy Votes on Executive Compensation and Other Matters, available at `https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202004&RIN=3235-AK67`.

[57]Testimony from Commissioner Robert Jackson, "Common Ownership: The Investor Protection Challenge of the 21st Century," FTC (Dec. 6, 2018), available at https://www.sec.gov/news/testimony/jackson-testimony-ftc-120618 (last accessed Aug. 11, 2020). ("Each year, institutional investors cast votes in corporate elections on behalf of more than 100 million American families, wielding significant power in the future of our companies and communities. Yet investors do not get nearly enough information about how their money is being voted. It's time for that to change.").

As the dilemma posed by the SEC's recent guidance shows, any policy in this area should consider the effects of changes to legal constraints on institutional share lending activity on voting outcomes and corporate behavior. In this paper, we have established that changing those legal constraints meaningfully affected the degree to which passive institutional investors engage in such lending—leading to confusion about fiduciary duty and uncertainty about voter turnout and outcomes. We hope that our evidence provides a starting point for both researchers and lawmakers interested in a careful weighing of the costs and benefits of changes to the law governing institutional share lending.

# References

Aggarwal, Reena, Pedro AC Saffi, and Jason Sturgess, 2015, The role of institutional investors in voting: Evidence from the securities lending market, *The Journal of Finance* 70, 2309–2346.

Appel, Ian R, Todd A Gormley, and Donald B Keim, 2016, Passive investors, not passive owners, *Journal of Financial Economics* 121, 111–141.

Bebchuk, Lucian, and Scott Hirst, 2019, Index funds and the future of corporate governance: Theory, evidence, and policy, *Columbia Law Review* 119, 2029–2146.

Bebchuk, Lucian A, Alma Cohen, and Scott Hirst, 2017, The agency problems of institutional investors, *Journal of Economic Perspectives* 31, 89–102.

Black, Bernard S, 1991, Agents watching agents: The promise of institutional investor voice, *UCLA Law Review* 39, 811–894.

Bogle, John C, 2018, Bogle sounds a warning on index funds, *The Wall Street Journal* .

Brav, Alon, Wei Jiang, Tao Li, and James Pinnington, 2018, Picking friends before picking (proxy) fights: How mutual fund voting shapes proxy contests, *Columbia Business School Research Paper* .

Coates, John C, IV, 2018, The Future of Corporate Governance Part I: The Problem of Twelve, *Harvard Public Law Working Paper No. 19-07* .

Coffee, John C, Jr., 1991, Liquidity versus control: The institutional investor as corporate monitor, *Columbia Law Review* 91, 1277–1368.

Gilson, Ronald J, and Jeffrey N Gordon, 2013, The agency costs of agency capitalism: Activist investors and the revaluation of governance rights, *Columbia Law Review* 863–927.

Hirst, Scott, and Lucian Bebchuk, 2019, The specter of the giant three, *Boston University Law Review* 99, 721–741.

Hu, Henry TC, and Bernard Black, 2005, The new vote buying: Empty voting and hidden (morphable) ownership, *Southern California Law Review* 79, 811–908.

Iacus, Stefano M, Gary King, and Giuseppe Porro, 2012, Causal inference without balance checking: Coarsened exact matching, *Political Analysis* 20, 1–24.

Johnson, Travis L, and Gregory Weitzner, 2019, Distortions caused by lending fee retention, *Working paper* Available at `https://ssrn.com/abstract=3081123`.

Kahan, Marcel, and Edward Rock, 2007, The hanging chads of corporate voting, *Geo. LJ* 96, 1227–1282.

Lim, Dawn, 2019, Index funds are the new kings of wall street, *The Wall Street Journal* September 18, available at `https://www.wsj.com/articles/index-funds-are-the-new-kings-of-wall-street-11568799004` (last accessed July 1, 2020).

Lim, Dawn, 2020, How investing giants gave away voting power ahead of a shareholder fight, *The Wall Street Journal* June 10, available at `https://www.wsj.com/articles/how-investing-giants-gave-away-voting-power-ahead-of-a-shareholder-fight-11591793863` (last accessed July 1, 2020).

Malkiel, Burton G, 2013, Asset management fees and the growth of finance, *Journal of Economic Perspectives* 27, 97–108.

Mitts, Joshua R, 2020, Passive exit, *Columbia Law and Economics Working Paper* Available at SSRN: `https://ssrn.com/abstract=3716249`.

Morley, John, 2013, The separation of funds and managers: a theory of investment fund structure and regulation, *Yale Law Journal* 123, 1228–1287.

MorningStar, 2018, Securities lending. an examination of the risks and rewards, `https://www.morningstar.com/content/dam/marketing/shared/pdfs/Research/Securities_Lending-An_Examination_of_the_Risks_and_Rewards.pdf` (last accessed July 1, 2020).

Novick, Barbara, 2020, 'The Goldilocks Dilemma': A response to Lucian Bebchuk and Scott Hirst 120, 80.

Stuart, Elizabeth A, 2010, Matching methods for causal inference: A review and a look forward, *Statistical Science: A Review Journal of the Institute of Mathematical Statistics* 25, 1–21.

Figure 1: This figure plots the supply of shares as a percentage of shares outstanding (solid lines) and shares on loan as a percentage of shares outstanding (dashed lines) for GameStop around the record date. Data for 2020 is in purple, and years 2017–2019 are averaged and colored green.
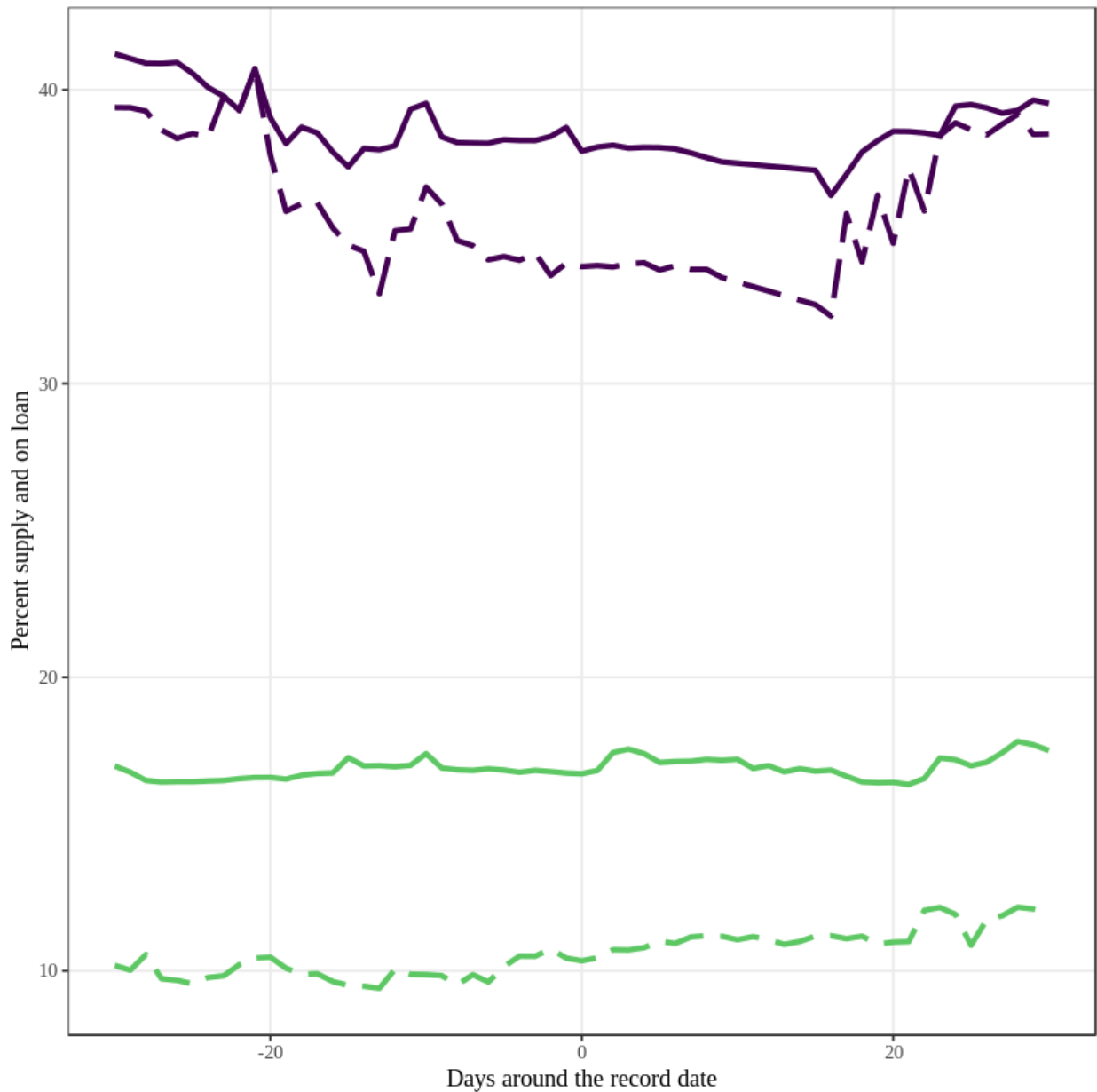
Figure 2: These figures plot the supply of shares in event time around record dates for Pre and Post guidance samples. Stocks with high passive ownership are colored green, and stocks with low passive ownership are colored purple. Estimates are based on regressions of supply on event date firm fixed effects, estimated in each respective sample. Standard errors are clustered by firm.
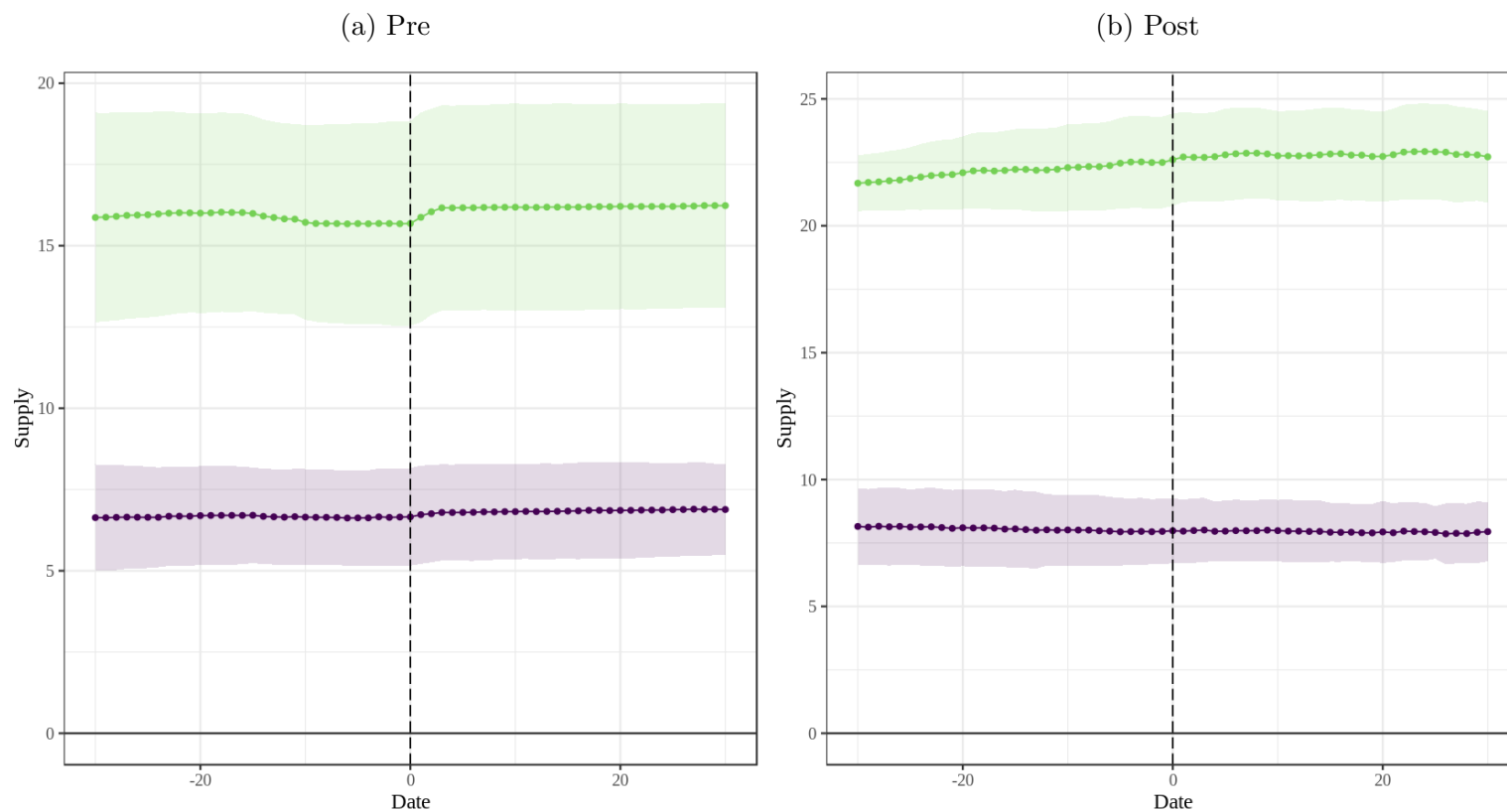
(a) Pre

(b) Post

32

Figure 3: This figure plots the average supply of shares between $t \in [-10, 0)$ over our 2017–2020 matched sample. We control for variation in institutional ownership and then plot the conditional average share supply for each of the four groups: high and low index ownership, pre and post guidance. The high index ownership group is denoted in green, and the low index ownership group is denoted in purple. The vertical dashed line represents the August 2019 SEC guidance, and the post-guidance observations are denoted using dashed lines.
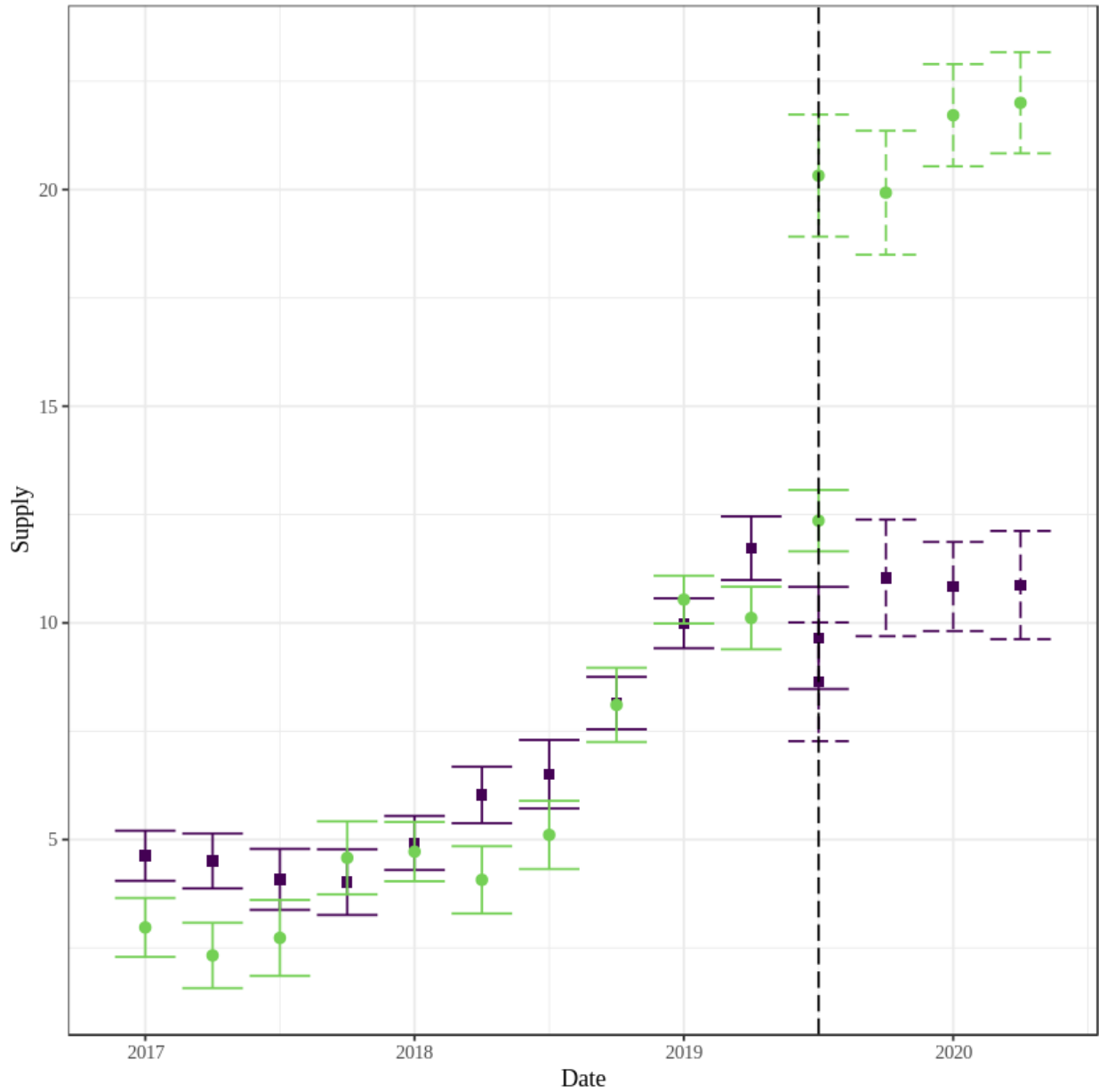
Table 1: This table reports summary statistics based on the cross section of firm-level averages for the thirty business days around the record date ($t \in [-30, +30]$). Institutional ownership, and ownership concentration (HHI) are based on Thomson Reuters' S34 data. Index ownership is based on index fund holdings reported in the CRSP Mutual Fund Database. Market cap is based on the price and shares outstanding as reported in the CRSP monthly files. The average expense ratio is the share-weighted average index fund expense ratio across index funds that hold a given stock. These variables are measured quarterly on a six month lag to ensure data availability throughout our sample. Supply is the percent of shares outstanding that are available to be loaned, based on the daily number of lendable shares reported in the FIS Astec data, and daily shares outstanding as reported in the TAQ master files. On loan is the percent of shares outstanding that are actually on loan as reported in the FIS Astec data. Utilization is the ratio of shares on loan divided by share supply. Loan rate is the share-weighted retail average loan rate from FIS.

(a) Pre guidance

|  | N | Mean | St. Dev. | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|
| Institutional ownership | 2,996 | 59.46 | 30.15 | 36.36 | 66.39 | 83.96 |
| Ownership concentration | 2,973 | 12.41 | 14.30 | 4.68 | 6.81 | 13.82 |
| Index ownership | 2,924 | 33.97 | 19.65 | 18.66 | 32.51 | 50.36 |
| Average expense ratio | 2,921 | 0.53 | 0.25 | 0.38 | 0.57 | 0.69 |
| Market cap | 2,995 | 6.47 | 30.69 | 0.18 | 0.71 | 2.72 |
| Supply (%) | 3,740 | 10.29 | 6.71 | 4.37 | 10.18 | 15.61 |
| On loan | 3,740 | 1.51 | 2.23 | 0.13 | 0.58 | 1.90 |
| Utilization | 3,740 | 18.64 | 23.85 | 2.50 | 7.85 | 24.13 |
| Loan rate | 3,740 | 9.12 | 31.86 | 0.77 | 0.93 | 3.57 |

(b) Post guidance

|  | N | Mean | St. Dev. | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|
| Institutional ownership | 2,055 | 55.07 | 28.85 | 29.61 | 61.55 | 77.44 |
| Ownership concentration | 2,043 | 13.15 | 14.28 | 4.98 | 6.98 | 14.72 |
| Index ownership | 2,028 | 41.91 | 22.74 | 24.31 | 42.30 | 60.62 |
| Average expense ratio | 2,026 | 0.35 | 0.25 | 0.15 | 0.35 | 0.51 |
| Market cap | 2,055 | 9.34 | 43.74 | 0.20 | 0.94 | 4.12 |
| Supply | 2,269 | 16.30 | 9.60 | 7.53 | 17.19 | 23.94 |
| On loan | 2,269 | 1.57 | 2.85 | 0.12 | 0.49 | 1.79 |
| Utilization | 2,269 | 12.70 | 20.31 | 1.00 | 3.88 | 13.91 |
| Loan rate | 2,269 | 6.07 | 30.64 | 0.63 | 0.70 | 0.93 |

Table 2: This table reports balance statistics for the pre-guidance sample, comparing the treatment group of high index ownership firms, to the control group of low index ownership firms. The first two columns are averages, the third is the standard deviation of the control group. The fourth is the standardized mean difference, which is computed as the difference between the first and second column, divided by the treatment group standard deviation. In Panel (b) the matched sample is constructed using coarsened exact matching where firms are matched on $t \in [-10, 0)$ average percent supply of shares, percent shares on loan, log market cap, institutional ownership, ownership concentration, average loan rate, and average index fund expense ratio. Breakpoints for the index fund expense ratios are based on ten percent intervals.

(a) Full sample

|  | Treated | Control | SD Control | Diff |
|---|---|---|---|---|
| Supply | 15.398 | 6.708 | 4.510 | 2.012 |
| Institutional ownership | 79.701 | 42.354 | 27.153 | 2.397 |
| Ownership concentration | 5.489 | 17.448 | 14.469 | -4.725 |
| log(Market cap) | 14.831 | 12.273 | 1.553 | 1.656 |
| On loan | 2.009 | 1.217 | 1.804 | 0.302 |
| Loan rate | 1.095 | 12.349 | 36.547 | -3.835 |
| Expense ratio | 0.093 | 0.088 | 0.071 | 0.221 |
| Index ownership | 50.7 | 17.5 | 9.5 | 3.087 |

(b) Matched sample

|  | Treated | Control | SD Control | Diff |
|---|---|---|---|---|
| Supply | 12.420 | 12.290 | 3.839 | 0.030 |
| Institutional ownership | 69.934 | 69.770 | 14.893 | 0.011 |
| Ownership concentration | 5.936 | 5.967 | 2.517 | -0.012 |
| log(Market cap) | 14.148 | 14.100 | 1.895 | 0.032 |
| On loan | 0.740 | 0.772 | 1.166 | -0.012 |
| Loan rate | 0.920 | 0.879 | 0.741 | 0.014 |
| Expense ratio | 0.085 | 0.085 | 0.017 | 0.038 |
| Index ownership | 43.5 | 27.4 | 4.3 | 1.496 |

Table 3: This table reports estimates of the change in share lending supply after the August 2019 SEC guidance. The estimates are from regressions of lendable share supply on an indicator for the post guidance period, an indicator for high index ownership stocks, and controlling for institutional ownership, ownership concentration, the average retail loan rate, shares on loan, the passive fund ownership, the average expense ratio across index funds that hold the stock, and whether the meeting is a proxy fight. Columns (1)–(4) use the full sample. Column (5) uses the sample of proxy fights. Column (6) uses our matched sample. Column (3) adds firm fixed effects. Columns (4)–(6) also include year-month fixed effects. Variable definitions can be found in Table 1, and the description of the matched sample construction can be found in Table 2.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Post guidance × High index | 5.397*** | 5.131*** | 3.699*** | 4.254*** | 3.835*** | 3.032*** |
| | (0.228) | (0.186) | (0.168) | (0.161) | (1.251) | (0.519) |
| | | | | | | |
| Post guidance | 1.332*** | 1.272*** | 1.268*** | | | |
| | (0.169) | (0.127) | (0.126) | | | |
| | | | | | | |
| High index | 9.050*** | −0.239 | −0.850*** | −0.660*** | 0.805 | 0.692** |
| | (0.158) | (0.242) | (0.225) | (0.209) | (2.474) | (0.345) |
| | | | | | | |
| Average | 6.634*** | 3.016*** | | | | |
| | | | | | | |
| Controls | | X | X | X | X | X |
| Fixed Effects | | | Firm | Firm+YM | Firm+YM | Firm+YM |
| Sample | Full | Full | Full | Full | Contest | Matched |
| Observations | 89,030 | 88,696 | 88,696 | 88,696 | 3,310 | 8,957 |
| $R^2$ | 0.542 | 0.724 | 0.910 | 0.929 | 0.983 | 0.894 |

*Note:* Standard Errors clustered by firm. *p<0.1; **p<0.05; ***p<0.01

36

<div align="center">

# Internet Appendix for
# The Index-Fund Dilemma: An Empirical Study of the Lending-Voting Tradeoff

Edwin Hu, Joshua Mitts, Haley Sylvester

December 2020

</div>

# A  Pre-trend differences and placebo dates

Figure A1 plots the average supply of shares in the ten days prior to the record date for our treated and control group stocks using our full sample in calendar time, controlling for variation in institutional ownership over time—which, all things equal, is a principal determinant of the supply of lendable shares. While similar to Figure 3 using our matched sample in the main text, there is one area of concern: some potential pre-trend differences for high index ownership stocks beginning in 2017, whereby share lending by index funds appears to decrease and then overtake share lending by non-index funds at the average stock level. While these differences could be cyclical variations, and can be mitigated using matching, they could nonetheless bias our estimates in our full sample regressions in Table 3.

To evaluate whether our difference-in-differences estimates could be driven by an earlier pre-trend difference we run regression specification (4) from Table 3 using 1,000 placebo dates. We drop our treated observations after the guidance, and to ensure that we have enough data for both a pre and post period, we use only the months June 2016–February 2019 as potential placebo dates.

Figure A2 plots the distribution of our placebo estimates, along with a vertical dotted line indicating our estimate from Table 3 Column (4). The distribution is bi-modal, with peaks at around 0.5, and 1.7. Importantly our "true" estimate falls well outside the distribution of our placebo estimates.[1] Therefore, we are confident that the post guidance difference is meaningfully different from potential prior differences between our treatment and control groups.

# B  Matched sample in event time

Table 2 shows that the difference in supply between our treatment and control groups is similar, and Figure 3 shows that the levels and trends prior to the guidance are similar for our matched sample.

Figure A3 shows that the supply of loans between our treatment and control groups is also similar in event time. We split the sample into high and low index ownership stocks. Each estimate is based on a regression of the supply of shares on an indicator for the event date ($t$) and standard errors are calculated with firm-level clustering. After matching, the average supply of loans for stocks with high index fund is still higher than those with low index fund ownership, but unlike in Figure 2 the two averages are no longer statistically distinguishable from one another.

---

[1] The point estimate of 1.7 can be obtained using a placebo date of July 2018. This corresponds approximately to the pre-trend increase in supply for high index ownership stocks that we see in Figure A1.

1

# C   Fund expense ratios

One possible explanation for a dramatic increase in share lending could be if funds decided to substitute securities lending fees for management fees.[2] To verify that our results are not driven by such a structural break in the funding model for mutual funds, we plot average fund expense ratios in Figure A4. Index funds are colored green, and non-index funds are colored purple. Our estimates show that index fund expense ratios are significantly lower than non-index fund expense ratios. Both trend downwards somewhat during our sample, but we do not find evidence of any sudden changes in average fund expense ratios in our sample. Therefore, we do not find any substitution between fund expenses and securities lending fees.

---

[2]For example, in June of 2020 BlackRock announced it would be cutting fees to compete with Vanguard. https://www.wsj.com/articles/blackrock-cuts-fees-for-its-largest-exchange-traded-fund-to-match-vanguard-11593118800.

Figure A1: This figure plots the average supply of shares between $t \in [-10, 0)$ over our 2017–2020 full sample. We control for variation in institutional ownership and then plot the conditional average share supply for each of the four groups: high and low index ownership, pre and post guidance. The high index ownership group is denoted in green, and the low index ownership group is denoted in purple. The vertical dashed line represents the August 2019 SEC guidance, and the post-guidance observations are denoted using dashed lines.
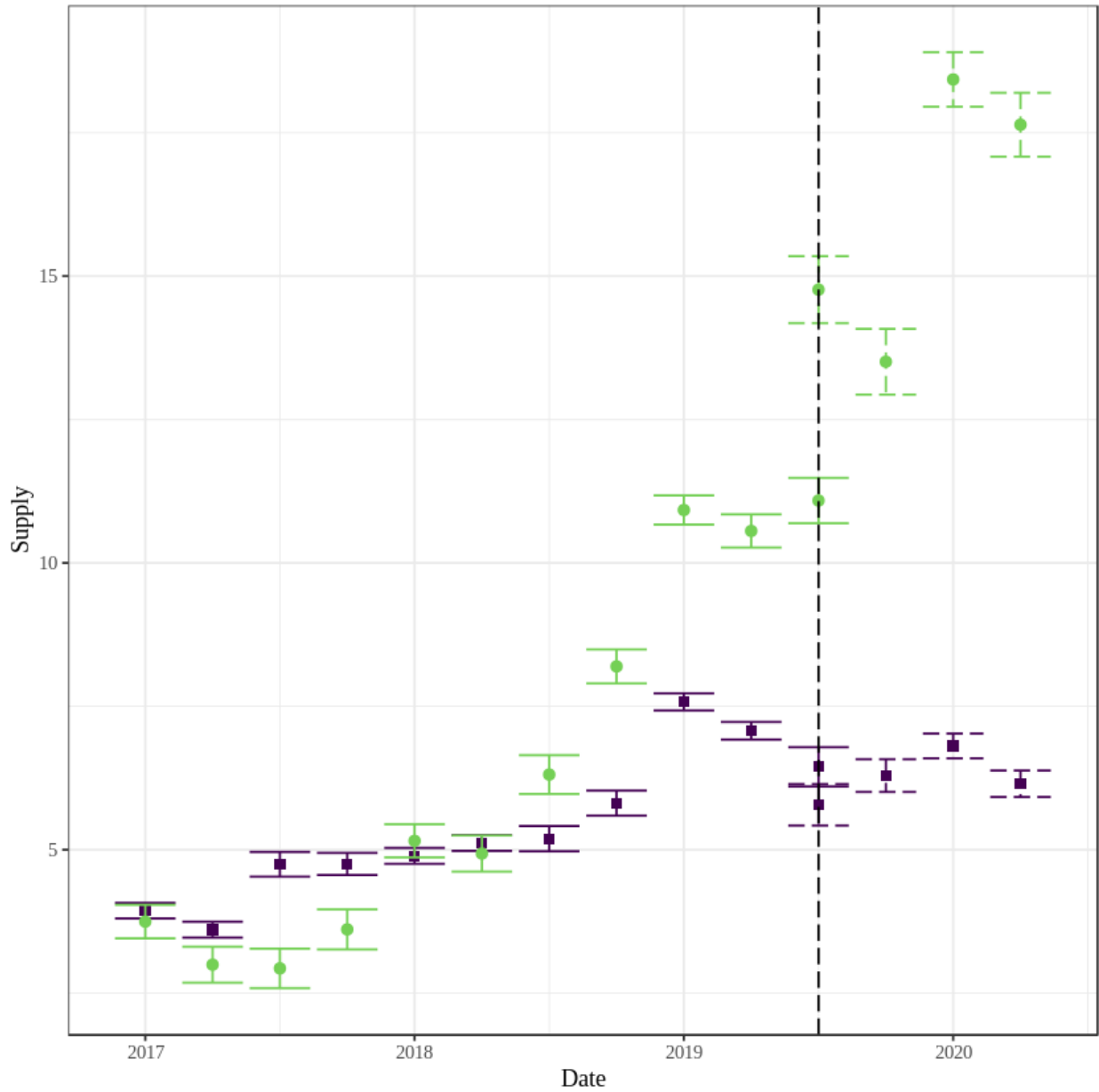
Figure A2: This figure plots the point estimates from the interaction term corresponding to Column (4) of Table 1. We randomly select 1,000 dates between the months June 2016–February 2019 for our placebo regressions. The sample ends in August 2019 to avoid picking up the effect of the guidance itself in our placebo tests. The dotted line is our lowest estimate, corresponding to Column (6) of Table 3.
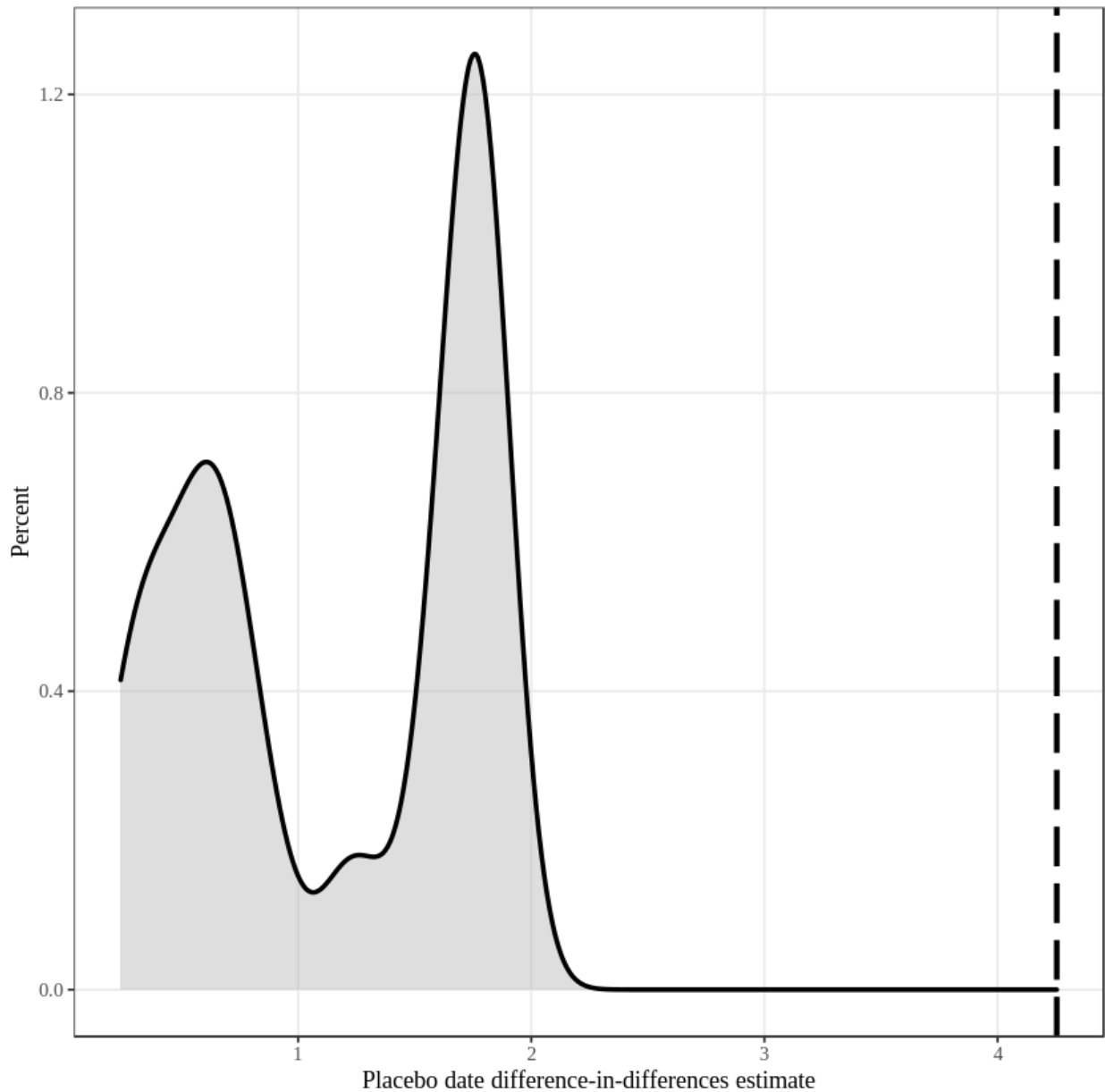


4

Figure A3: This figure plots the supply of shares in event time around record dates for the pre-guidance matched sample. Stocks with high passive ownership are colored green, and stocks with low passive ownership are colored purple. Estimates are based on regressions of supply on event date firm fixed effects, estimated in each respective sample. Standard errors are clustered by firm.
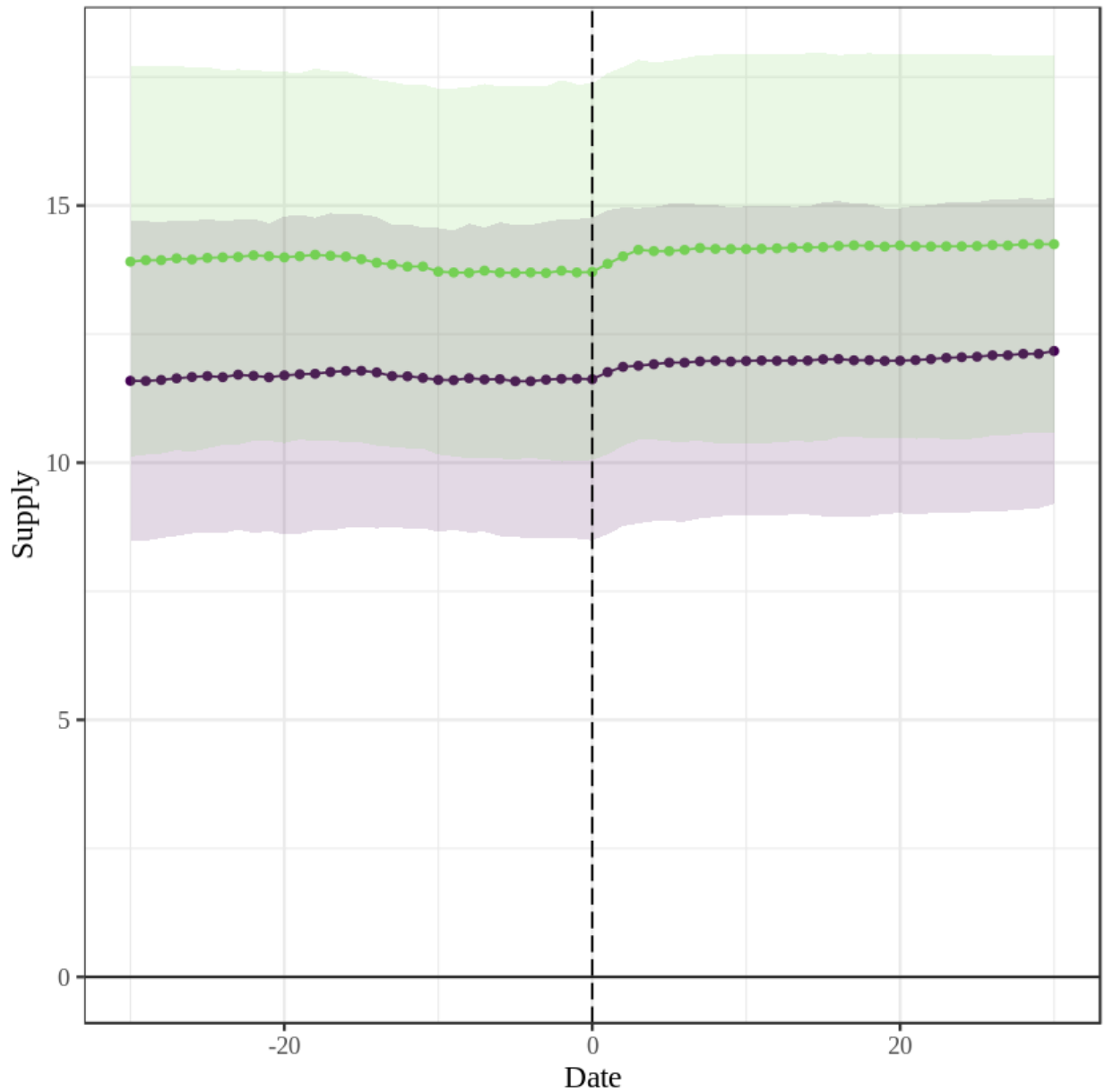
Figure A4: This figure plots the average expense ratio at the fund-level over our sample. Index funds are colored green, and non-index funds are colored purple. Estimates are based on regressions of fund expense ratios on calendar date firm fixed effects. Standard errors are clustered by fund.



6