Catering When It Counts: Dividends and Portfolio Reallocation*

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September 9, 2026

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Abstract

When do firms cater to their shareholders' dividend preferences? This paper shows that they do so when shareholders actively reallocate their portfolios. I identify such periods using large mutual fund flows, which are associated with more discretionary trading. Firms exposed to large flows significantly increase dividends. The response is symmetric across inflows and outflows, and announcements follow in the quarter immediately after large flows, consistent with firms timing payout to windows of reallocation. A difference-in-differences design exploiting the introduction of Morningstar Sustainability Ratings supports causality. Cross-sectional evidence shows that firms use dividends to satisfy investors' preferences and not to mitigate agency frictions. Funds subsequently favor firms that raise dividends following both inflow and outflow shocks.

*I am grateful to my advisors, Sebastien Betermier and David Schumacher, and to Paul Beaumont, for their invaluable guidance and support. I acknowledge helpful comments from Basile Dubois, Jim Goldman, Thomas Rivera, Begum Ipek Yavuz, and seminar participants at the Canadian Sustainable Finance Network (CSFN) Conference and McGill University. All remaining errors are my own.

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1 Introduction

One reason firms cater to investors' preferences for dividends is to influence where those investors allocate their capital (Allen et al., 2000; Baker and Wurgler, 2004; Manconi and Massa, 2013). Such catering is more likely to translate into actual capital allocation when investors are actively deciding where to invest. However, investors are not always in this position. Reallocation is costly, and portfolio weights tend to be persistent. For example, mutual fund managers accommodate investor flows primarily by scaling existing positions rather than rethinking their portfolio weights (Lou, 2012). The effectiveness of catering therefore depends on its timing. This paper asks whether firms strategically increase dividends when their shareholders are actively reconsidering their portfolios.

Answering this question is challenging because it requires identifying periods in which shareholders actively reconsider their portfolios. Realized trading activity is a natural candidate, but it may be mechanical, may reflect investors' assessments of the firm, or may respond to the same information that drives payout decisions. These concerns make it difficult to tell whether firms are responding to shareholder reallocation or whether investor trading and corporate payout decisions are jointly driven by a common underlying factor. To address this challenge, I use large mutual fund flows. Flows are determined at the fund level rather than at the level of a particular holding, mitigating concerns that they directly reflect firm-specific information. More importantly, while typical flows can be absorbed by proportional scaling, large flows cannot be. As liquidity and price impact constraints bind, managers need to decide which positions to adjust and by how much. Practitioners also argue that sizable inflows or outflows are difficult to accommodate within existing portfolio strategies and may force fund managers to revisit those strategies.[1] Large flows therefore identify periods in which deliberate portfolio decisions are more likely to occur.

In this paper, I empirically investigate whether large fund flows induce active portfolio rebalancing and whether firms strategically increase dividends when fund managers are forced to reconsider their portfolios. I further examine whether these dividend increases successfully attract subsequent mutual fund investment. To do so, I combine international data on equity mutual funds, institutional portfolio holdings, and publicly listed firms to construct a sample of 14,593 funds and 17,853 firms over the 2000–2021 period.

I first examine how fund managers adjust their portfolios in response to large fund flows. I find a strong positive association between the size of fund flows and discretionary trading. Quantitatively, a one-standard-deviation increase in absolute flows is associated with a 32% rise in deviations from proportional flow allocation, and this pattern holds

[1] Morningstar (2015) quotes an industry veteran at a major asset management group: "Heavy inflows or outflows have a negative impact on investment strategy implementation." Morningstar (2017) further notes that large inflows or outflows can be very disruptive, noting that they absorb a substantial portion of fund managers' time and may necessitate adjustments in portfolio management strategies.

in both inflow and outflow periods. Rather than simply scaling positions proportionally, fund managers make more active and deliberate trading decisions when facing larger flows.

Building on this evidence, I next examine whether firms increase dividends when fund flows prompt fund managers to reconsider their portfolios. Firms exposed to larger absolute flows increase dividends: a one-standard-deviation increase in flow exposure corresponds to a 1.5% rise in dividends relative to the unconditional mean. Notably, dividends increase following both large inflows and outflows. The symmetric response is consistent with firms responding to the underlying portfolio reallocation induced by large flows, rather than to the direction of trading itself. In contrast, repurchases respond only to price pressure induced by outflows, consistent with a market timing motive.

Two additional patterns further support the interpretation that dividends respond to portfolio reallocation. First, the dividend response is concentrated among firms exposed to extreme flows. This evidence is consistent with firms responding when flows are large enough to prompt active portfolio reallocation. Second, the timing of the response is consistent with a deliberate adjustment of dividends by firms. Exposure to large flows in the immediately preceding quarter predicts subsequent dividend announcements, whereas exposure to flows in other preceding quarters does not. Moreover, the result is driven by announcements of dividend increases rather than by those of unchanged or reduced dividends. Taken together, these results suggest that firms strategically time their dividend increases around periods when their shareholders reconsider their portfolios.

While the results are consistent with strategic responses to active portfolio reallocation, they do not establish a causal effect. Although the use of fund flows mitigates concerns that the measure directly reflects firm-specific information, fund flows are related to fund performance and may therefore be correlated with the characteristics of firms held by the fund. To address this concern, I exploit the 2016 introduction of Morningstar Sustainability Ratings as a source of exogenous variation in fund flows. Hartzmark and Sussman (2019) show that this rating publication generated significant inflows to funds receiving "Five Globes" and outflows from those receiving "One Globe" without affecting fund performance. I find similar flow patterns in my sample.

Leveraging this identification strategy, I implement a difference-in-differences (DiD) analysis by defining treated firms as those in the top quartile of ownership by either five-globe or one-globe funds as of December 2015. I find that treated firms increase their dividends following the flow shock, and I find no evidence of differential pre-trends. Consistent with the baseline findings, dividend increases occur following both the inflow shock from five-globe funds and the outflow shock from one-globe funds, confirming the symmetric response. Collectively, these results strengthen the evidence that firms strategically increase dividends in response to portfolio reallocation and provide support for a causal interpretation.

Why would firms increase dividends when their shareholders reallocate portfolios? The payout literature offers two competing channels. The first is a catering channel. If dividend increases during reallocation reflect catering, the response should be stronger among firms with a greater incentive to satisfy shareholders' dividend preferences. The second is a governance channel. Large flows may strengthen governance through intensified monitoring and the threat of exit during active rebalancing. Dividends can serve as a commitment device that disciplines corporate managers by reducing the free cash flow available for value-destroying investment (Easterbrook, 1984; Jensen, 1986). If governance drives the response, dividend increases should be concentrated among firms with greater free cash flow problems.

The results are consistent with a catering channel. The response is stronger among firms with greater ownership by dividend income funds, greater ownership by funds domiciled in countries with older populations, and larger deviations of actual dividends from target dividends implied by shareholders' revealed preferences, particularly among firms with higher target dividends. By contrast, the results provide little evidence of a governance channel. The response is not stronger among firms with greater potential for free cash flow problems, as captured by low leverage, high cash holdings, high free cash flow, low market-to-book ratios, low sales growth, and low investment.

Finally, I examine whether this strategic dividend policy generates a favorable investment response. Among treated firms, those that increase dividends are subsequently favored both by funds experiencing inflow shocks and by funds experiencing outflow shocks. This pattern suggests that dividend increases during portfolio reallocation can be effective not only in attracting new capital from funds experiencing inflows, but also in retaining investment from funds experiencing outflows. In sum, the full set of evidence highlights a strategic interaction in which large fund flows induce active portfolio rebalancing, firms respond by increasing dividends, and funds subsequently reallocate capital toward firms that raise dividends.

This paper makes three contributions. First, it highlights shareholders' portfolio reallocation as a distinct dimension of catering. Existing work identifies catering through two dimensions. The first is market conditions: Baker and Wurgler (2004) show that firms initiate dividends when the market places a premium on dividend payers, Li and Lie (2006) extend this to the intensive margin of dividend increases and decreases, and a related literature documents payout responses to changes in dividend tax law (Chetty and Saez, 2005; Hanlon and Hoopes, 2014). The second is the identity of the investor: firms adjust payout to the tax status of their institutional owners (Allen et al., 2000; Grinstein and Michaely, 2005; Desai and Jin, 2011), to the age composition of the local investor base (Becker et al., 2011), and to the revealed preferences of a shareholder base inherited in a stock-swap merger (Golubov et al., 2020). What neither dimension considers is whether shareholders are in a position to act on their preferences at the moment a firm pays. This matters because timing is not simply an additional dimension alongside the other two. It determines how much catering along either of them translates into capital allocation. Moreover, my setting isolates the timing of catering from the preferences it responds to. I use large mutual fund flows as a source of variation in whether shareholders are revisiting their portfolio weights, an approach that holds the shareholder base fixed. Existing work identifies catering from variation in who holds the shares, but here what changes is whether those holdings are being reconsidered. This separates the question of *when* firms cater from the question of *whom* they cater to.

Second, this paper documents a real effect of mutual fund flows that does not operate through prices. Prior work emphasizes flow-induced price pressure (Edmans et al., 2012; Khan et al., 2012; Lou and Wang, 2018) or stock price fragility (Friberg et al., 2024; Massa et al., 2025). Neither channel accounts for the symmetric dividend increases I document. Price pressure runs in opposite directions for inflows and outflows. Fragility, if anything, predicts that firms conserve resources and pay out less. What firms appear to respond to is the flow-induced reallocation itself rather than its price consequences. In addition, I show that funds facing large flows subsequently tilt toward firms that raise dividends. These findings suggest that mutual fund flows catalyze a strategic interaction between firms and investors: firms are not passive recipients of investor capital but active participants whose responses feed back into investor portfolio decisions.

Third, this paper contributes to the literature on mutual fund flows and flow-induced trading by showing that fund managers' responses to flows vary systematically with flow magnitude. Prior work documents that fund managers, on average, allocate a substantial fraction of flows proportionally across existing positions (Coval and Stafford, 2007; Lou, 2012). Based on this idea of proportional trading, several studies have constructed flow-driven price pressure instruments to identify non-fundamental valuation shocks and evaluate their real effects on corporate policies (e.g., Edmans et al., 2012). More recent evidence, however, suggests significant heterogeneity in this response, indicating that flow-induced trading is not purely mechanical (Berger, 2023). I document that discretionary trading intensity increases with the magnitude of flows, indicating that non-proportional reallocation is an endogenous response to fund flows. This relation identifies the moments at which portfolio weights are actively revisited, which is where corporate strategic responses take hold.

2 Data and Sample Construction

2.1 Data Sources

My empirical analysis relies on three primary data sources. First, I obtain firm-level accounting information and stock market data for a global sample of publicly traded companies from Worldscope and Datastream. From Worldscope, I retrieve key balance sheet, income statement, and cash flow items, including total assets, debt, capital expenditures, R&D expenditures, cash holdings, intangible assets, and operating cash flows, along with corporate payout data comprising dividends and share repurchases. From Datastream, I collect firm-level stock market data, including stock prices, returns, shares outstanding, and dividend announcement dates. Second, I source mutual fund characteristics and performance from Morningstar Direct, focusing on actively managed open-end equity funds domiciled in various countries. In addition to total net assets (TNAs), returns, inception dates, and fund domiciles, I retrieve each fund's Morningstar category and its Morningstar Sustainability Rating, first published in March 2016, which I use in the difference-in-differences analysis in Section 5. Third, I retrieve institutional equity positions from the FactSet Ownership database. This database provides a comprehensive repository of equity positions held by various institutions, defined as professional money managers with discretionary authority over assets, including mutual funds, pension funds, and insurance companies. All monetary variables, including firm-level accounting items, stock prices, fund-level TNAs, and fund flows, are converted into U.S. dollar terms.

2.2 Sample Construction

2.2.1 Mutual Fund Sample

To construct the fund sample, I merge the fund-level characteristics from Morningstar Direct with the position-level holdings from FactSet, which yields a comprehensive dataset of portfolio allocations for my sample funds. I limit the universe to open-end equity funds, identified using Morningstar's Broad Category Group classification. For funds with multiple share classes, I aggregate TNAs across all classes to obtain the fund-level TNA, and calculate the fund-level return as the average of the individual share class returns. Following Elton et al. (2001) and Evans (2010), I restrict the sample to funds that have been in existence for at least three years and manage TNA of at least $15 million to mitigate incubation and survivorship biases. Because FactSet reports institutional equity positions on a quarterly basis, the fund-level panel is analyzed at the quarterly frequency.[2]

The baseline sample consists of actively managed funds, because the portfolio reallocation that motivates my analysis is a discretionary decision made by active managers. I therefore exclude passive funds, defined as funds that Morningstar classifies as index funds or whose fund names contain the words "index," "idx," or "passive."[3] These screens

[2]To address the heterogeneous reporting frequencies (quarterly, semi-annual, or annual) in FactSet, I standardize the data to a quarterly frequency using a forward-fill approach, assuming that missing quarters carry over the latest reported holdings. To maintain data integrity, I do not apply forward-filling if the reporting gap exceeds four consecutive quarters, or if the fund reaches its final reporting date in the database. This prevents distorting the data by misinterpreting fund liquidations or data dropouts as active holding maintenance.

[3]Passive funds are used in Table A6, where I contrast firms' responses to the flows of their active and

identify 14,593 funds across 43 domicile countries, corresponding to 500,195 fund-quarter observations spanning 2000:Q1 through 2021:Q4.

2.2.2 Firm Sample

To construct the baseline sample for the firm-level empirical analysis, I apply a series of standard screening procedures. Following Massa et al. (2021), I apply the filters recommended by Ince and Porter (2006) to ensure data integrity. Next, I exclude firms in the utilities (SIC 4900–4999) and financial (SIC 6000–6999) sectors because of their distinct regulatory environments and capital structures. Firms are included in the empirical analysis only if they have non-missing values for the main payout variables and all control variables. Because flow-induced trading pressure is defined only for firms that are covered by FactSet and held by at least one sample fund, I further require firms to satisfy both conditions. These screening procedures yield a baseline sample of 17,853 firms from 68 countries, corresponding to 147,110 firm-year observations covering the years from 2000 to 2021.

2.3 Summary Statistics

Table 1 reports summary statistics for the fund and firm samples. All continuous variables are winsorized at the 1st and 99th percentiles. Panel A covers fund-quarter observations. The average mutual fund in the sample manages \$0.8 billion in TNA, earns a quarterly return of 2.7%, and is approximately 15 years old. Average net flows are slightly negative over the sample period, at -0.4% of beginning-of-quarter TNA. Although these average net flows are close to zero, the magnitude of flows remains economically large. The average absolute net flow is approximately 7.6% of beginning-of-quarter TNA, suggesting that mutual funds continue to experience substantial capital movement even when inflows and outflows largely offset.

Panel B covers the firm-level sample used in the baseline panel regressions. Firms distribute, on average, 2.8% of beginning-of-period assets through dividends and share repurchases. Dividends account for the majority of total payouts, at approximately 2% of assets, whereas repurchases are more concentrated across firms: the median firm pays a positive dividend but repurchases no shares. The average firm in the sample exhibits characteristics consistent with a growth firm, with a mean market-to-book ratio of 2.6 and a median of 1.6, broadly in line with prior corporate finance studies using an international sample of listed firms (e.g., Pinkowitz et al., 2016). Firms invest approximately 8% of beginning-of-period assets and hold average debt and cash ratios of 22% and 21% of assets, respectively. Intangible assets represent 13% of total assets, and the average return on equity is 4.9%. Institutional ownership averages 17% across firms.

passive shareholders.

3 Fund Flows and Discretionary Trading

A central premise of this paper is that large inflows or outflows lead fund managers to reassess their portfolio strategies and reconsider how capital is allocated across portfolio firms. Moderate flows do not necessarily have this effect: prior work shows that managers accommodate a substantial fraction of flows by scaling existing positions proportionally (Coval and Stafford, 2007; Lou, 2012). Large flows are different. As liquidity and price impact constraints bind, managers need to decide which positions to adjust and by how much. This portfolio reassessment is critical to the paper's argument because it creates a window of opportunity during which firms may influence mutual funds' subsequent investment decisions. Before examining whether firms respond strategically to this window through payout policies, I test this premise directly by investigating whether larger fund flows are associated with greater discretionary trading activity.

Portfolio reassessment is not directly observable. Thus, I infer it from the extent to which realized fund trading deviates from a benchmark of purely proportional trading. If managers simply accommodate investor flows by scaling existing positions, trading should closely follow a pro-rata allocation based on existing portfolio weights. In contrast, if managers revisit their portfolio strategies, they are more likely to selectively increase some positions while reducing others, generating trading patterns that depart from proportional allocation. To capture such behavior, I construct a measure of Discretionary Trading Intensity (DTI).

To measure the extent of active portfolio rebalancing beyond mechanical adjustments to investor inflows and outflows, I first calculate the fund's realized trading, defined as the quarterly change in the number of shares of each individual stock held by the fund:

$$Trading_{f,s,q} = \Delta Holding_{f,s,q}$$

where $Holding_{f,s,q}$ is the number of shares of stock s held by fund f at the end of quarter q. Utilizing the number of shares allows me to eliminate confounding effects caused by stock price fluctuations and isolate the pure outcomes of trading activities.

Next, I compute pro-rata trading, which represents the hypothetical trading that would occur under the assumption that the fund manager invests the fund flows proportionally based on the existing portfolio holdings:

$$ProRataTrading_{f,s,q} = Holding_{f,s,q-1} \times Flow_{f,q}$$

where flows for fund f in quarter q are defined as

$$Flow_{f,q} = \frac{TNA_{f,q} - (1 + Ret_{f,q})TNA_{f,q-1}}{TNA_{f,q-1}}$$

and $TNA_{f,q}$ is total net assets for fund f as of the end of quarter q, and $Ret_{f,q}$ is the quarterly return for fund f in quarter q.

Then, I compute discretionary trading intensity. For each fund, I aggregate the absolute value of the difference between realized trading and pro-rata trading across all stocks held by the fund. Since the difference is measured in number of shares, I multiply it by the stock price from the previous quarter to convert it into a dollar value.

$$DTI_{f,q} = \sum_{s} \left(|Trading_{f,s,q} - ProRataTrading_{f,s,q}| \times Price_{s,q-1} \right) \tag{1}$$

The use of absolute values is motivated by the focus on the magnitude of discretionary trading rather than its direction.[4] Consequently, any buying or selling that deviates from the predicted pro-rata trading is interpreted as reflecting the fund manager's discretionary portfolio decision.

This approach offers two distinct advantages. First, by design, this methodology disentangles the passive component of trading from its active counterpart, thereby effectively capturing the degree to which fund managers actively expand or reduce stock positions beyond flow-induced proportional trading. Second, because the calculation does not divide by the stock price, it avoids building in a mechanical correlation between trading and returns (e.g., Wardlaw, 2020).

The summary statistics for DTI are provided in Panel A of Table 1. Discretionary trading is economically meaningful. The median fund executes \$41.9 million of trading per quarter beyond what would be predicted under purely proportional allocation of investor flows, with an interquartile range of \$11.2 million to \$155.3 million. These magnitudes are large relative to fund size: for the median fund, quarterly discretionary trading corresponds to roughly a quarter of total net assets. Even if a substantial fraction of flows is accommodated proportionally, a nontrivial amount of trading remains outside that benchmark in the typical fund-quarter.

Figure 1 provides a first look at how discretionary trading varies with the size of investor flows. Fund-quarters are sorted into terciles of net flows, and the figure plots average DTI scaled by total net assets within each tercile. The relation is U-shaped. Discretionary trading is lowest in the middle tercile, where flows are close to zero, at 28.3% of TNA, and rises to 33.6% in the bottom tercile and 38.4% in the top tercile. The increase on both sides of the distribution indicates that what matters is the magnitude of flows rather than their direction, which motivates using absolute flows as the explanatory

[4] The summation runs over the union of stocks held by fund f at the end of quarter $q-1$ and quarter q, so that newly initiated and fully liquidated positions are included. For a stock the fund did not hold at $q-1$, the pro-rata benchmark is zero and the entire purchase is counted as discretionary trading. For a position the fund exits during quarter q, realized trading is $-Holding_{f,s,q-1}$ while the benchmark is $Holding_{f,s,q-1} \times Flow_{f,q}$, so the deviation is the sale in excess of what proportional scaling would predict. This treatment is intentional: decisions to open or close a position involve a substantial degree of managerial discretion.

variable in the analysis that follows.

To examine whether larger fund flows are associated with greater discretionary trading by mutual fund managers, I estimate the following regression model:

$$\ln(DTI)_{f,q} = \beta_1|Flow|_{f,q} + \beta_2 \ln(TNA)_{f,q-1} + \beta_3 Return_{f,q-1} + \alpha_f + \alpha_{cat,q} + \varepsilon_{f,q} \quad (2)$$

where $DTI_{f,q}$ denotes the discretionary trading intensity of fund f in quarter q. The main explanatory variable, $|Flow|_{f,q}$, measures the magnitude of investor inflows and outflows. The contemporaneous flow measure is included to capture fund managers' trading adjustments at the time investor flows are realized. The control variables include lagged fund size and lagged fund returns. The specification also includes fund fixed effects and category-by-year-quarter fixed effects, so that β_1 is estimated from within-fund variation in flows relative to other funds in the same investment category and quarter. This addresses the concern that the univariate patterns in Figure 1 reflect differences across funds rather than variation in flows within a given fund. Standard errors are two-way clustered at the fund and category-by-year-quarter levels.

The coefficient of interest is β_1. If larger fund flows induce fund managers to reassess their portfolio strategies and engage in more active trading beyond proportional allocation, β_1 is expected to be positive. In contrast, if fund flows primarily generate mechanical scaling of existing positions, β_1 may be statistically insignificant.

Table 2 presents the relation between absolute fund flows and discretionary trading intensity. Across all specifications, the coefficient on $|Flow|$ is positive and statistically significant at the 1% level, indicating that funds experiencing larger inflows or outflows engage in more discretionary trading activity. The economic magnitude is also substantial. Using the full-sample estimate in Column (1), a one-standard-deviation increase in absolute fund flows is associated with approximately a 32% increase in discretionary trading intensity. Larger flows are thus accompanied by greater deviations from proportional flow allocations, which is what one would expect if they lead fund managers to reconsider which positions to hold and by how much.

Columns (2) and (3) split the sample by the direction of flows. The positive association between absolute fund flows and discretionary trading intensity is present in both the inflow and outflow subsamples, indicating that funds with large flows deviate from pro-rata trading patterns regardless of the direction of investor flows. The estimates are larger during inflow periods, 2.67 versus 1.83, broadly consistent with Lou (2012), who shows that outflow-related trading is relatively more mechanical. Although the specification already controls for lagged fund size, Columns (4) and (5) scale DTI by beginning-of-period total net assets before taking logs, which directly addresses the concern that the dollar-denominated measure mechanically reflects fund size. The estimates, 2.60 for inflows and 1.82 for outflows, are nearly identical to their unscaled counterparts, so the relation is not an artifact of larger funds trading larger dollar amounts.[5]

The estimated relation between lagged returns and discretionary trading provides additional insight into when fund managers are more likely to depart from proportional allocation. Lagged returns are negatively associated with discretionary trading intensity, and the association is concentrated in the outflow subsample. This pattern is consistent with fund managers responding to weak prior performance with more active portfolio repositioning, while strong prior performance may reduce the need to deviate from existing investment strategies. That discretionary trading also responds to performance is consistent with the view that it captures deliberate portfolio decisions rather than a mechanical byproduct of processing flows.

Overall, the evidence supports the central premise of the paper. As the magnitude of investor flows increases, fund managers deviate more from proportional allocation of those flows, and they do so following both inflows and outflows. These findings suggest that large flow realizations identify periods in which portfolio firms are more likely to be reevaluated by their mutual fund shareholders, which is the window of opportunity that motivates the analysis of corporate payout responses in the next section.

4 Dividend Responses to Portfolio Reallocation

Section 3 shows that fund managers depart further from proportional allocation as flows grow larger, and that they do so following both inflows and outflows. Therefore, large flows mark periods in which portfolio weights are actively revisited. Sections 4 and 5 examine whether firms increase dividends during these periods, first in the full panel and then using a quasi-experiment. This section presents the panel evidence.

Firms have reason to care about these periods. When shareholders revisit their portfolio weights, existing positions are open to being expanded, trimmed, or exited, so corporate policy plausibly bears more on capital allocation than it would at a moment when weights are simply carried forward. A firm that recognizes such a window would then have an incentive to act within it. Because dividends are sticky and costly to reverse (Lintner, 1956; Brav et al., 2005), timing a dividend adjustment to a particular window is a deliberate decision, which makes dividend policy a natural place to look for such a response. Why firms would respond in this way is a separate question, taken up in Section 6. In this section, I ask whether they do. I hypothesize that firms whose mutual fund shareholders experience larger flows increase dividends, and I examine repurchases

[5] Table A2 confirms that these results do not depend on how discretionary trading is normalized. Panel A scales DTI by total net assets and Panel B scales each holding's discretionary trading by the firm's shares outstanding before aggregating to the fund level. Panel C uses an indicator for whether the ratio of DTI to the fund's total trading falls in the top quintile of the sample, which addresses the concern that the results simply reflect funds that trade more overall. The coefficient on $|Flow|$ is positive and statistically significant in every specification.

alongside dividends to distinguish responses to reallocation from responses to the price consequences of flows.

4.1 Measuring Exposure to Flow-Induced Reallocation

To test the hypothesis developed above, I construct a firm-level measure of exposure to flow-induced portfolio reallocation. Because Section 3 shows that larger flows are associated with greater discretionary trading, firms whose mutual fund owners experience larger flows are more likely to have their positions reconsidered. This motivates the following measure of flow-induced trading pressure:

$$Trading\ Pressure_{s,q} = \frac{\sum_f Holding_{f,s,q-1} \times |Flow|_{f,q}}{Shares\ Outstanding_{s,q-1}} \tag{3}$$

where $Holding_{f,s,q-1}$ denotes the number of shares of stock s held by fund f at the end of quarter $q-1$, $|Flow|_{f,q}$ is the absolute value of fund f's flow during quarter q, and $Shares\ Outstanding_{s,q-1}$ is the number of shares outstanding for stock s at the end of quarter $q-1$. The measure is constructed quarterly and annualized by aggregating over the firm's fiscal year for the annual panel regressions.

A firm receives a high value of $Trading\ Pressure$ when a large fraction of its shares is held by funds experiencing substantial inflows or outflows. The use of absolute values follows from the evidence in Section 3, where discretionary trading rises with the magnitude of flows in both directions. What drives reallocation is the size of a flow, not its direction. The measure therefore captures how much of the firm's shareholder base is reallocating.

Large flows may also affect firms through a separate channel: temporary price pressure. Prior work shows that mutual fund inflows and outflows generate demand shocks that push prices away from fundamentals (e.g., Coval and Stafford, 2007; Edmans et al., 2012). To separate this mechanism from portfolio reallocation, I construct a complementary measure that retains the sign of flows:

$$Price\ Pressure_{s,q} = \frac{\sum_f Holding_{f,s,q-1} \times Flow_{f,q}}{Shares\ Outstanding_{s,q-1}} \tag{4}$$

The two measures differ only in the treatment of the sign. $Trading\ Pressure$ captures the intensity of flow-induced reallocation regardless of direction, whereas $Price\ Pressure$ captures the net demand shock imposed on the stock. The two therefore make different predictions. If firms respond to reallocation, the response should be similar for inflows and outflows, since both prompt managers to revisit their weights. If firms respond to prices, the response should reverse sign, since inflows push prices up and outflows push them down. Comparing the two measures separates the two explanations.

Panel B of Table 1 reports summary statistics. *Trading Pressure* averages 1.66% of lagged shares outstanding, meaning that in a typical firm-year, funds holding that fraction of the firm's shares are undergoing flow-induced rebalancing. Exposure varies considerably in the cross section. The median firm has a value of 0.82% while the firm at the 75th percentile has 2.54%, against a standard deviation of 2.00%. *Price Pressure*, by contrast, averages −0.15%, close to zero and slightly negative, mirroring the mildly negative average net flow in Panel A. Signed flows largely cancel across a firm's shareholders, whereas their magnitudes accumulate.

Using the pressure measures, I estimate the following panel regression:

$$Y_{s,t} = \beta\ Trading\ Pressure_{s,t-1} + \Gamma' Controls_{s,t-1} + \alpha_s + \alpha_{c,i,t} + \varepsilon_{s,t} \tag{5}$$

where $Y_{s,t}$ is dividends or share repurchases for firm s in fiscal year t, each scaled by beginning-of-period total assets. Some specifications include $Price\ Pressure_{s,t-1}$, constructed over the same window. Both pressure measures are standardized to have a mean of zero and a standard deviation of one, so coefficients indicate the effect of a one-standard-deviation increase in exposure. The hypothesis is $\beta > 0$ for dividends, and the null is $\beta = 0$.

Controls include standard determinants of payout policy, namely firm size, leverage, market-to-book, profitability, institutional ownership, cash holdings, intangible assets, investment, and selling, general, and administrative expenses. Variable definitions appear in Table A1. The specification includes firm fixed effects and country × industry × year fixed effects, so that β is identified from within-firm variation in exposure after controlling for shocks common to firms in the same country, industry, and year. Standard errors are two-way clustered at the firm and country × industry × year levels.

4.2 Baseline Results: Dividends and Reallocation

Table 3 reports the baseline estimates. Column (1) shows that *Trading Pressure* is positively associated with dividends and statistically significant at the 5% level. A one-standard-deviation increase in exposure corresponds to an increase in dividends of 0.03 percentage points of assets, or approximately 1.5% of the unconditional mean dividend. Column (2) adds *Price Pressure*. The coefficient on *Price Pressure* is essentially zero and statistically insignificant, and the coefficient on *Trading Pressure* is unchanged. This finding suggests that dividends respond to the extent of shareholder reallocation, rather than to the net demand pressure that those flows impose on the stock.

Column (3) decomposes *Trading Pressure* into inflow- and outflow-induced components, constructed from funds experiencing positive and negative flows respectively. Both are positive and statistically significant, and their magnitudes are nearly identical. Firms increase dividends when their shareholders are reallocating, whether the underlying funds experience large inflows or large outflows. This symmetry is difficult to reconcile with a price-based explanation, since inflows and outflows exert opposite pressure on stock prices. Instead, firms appear to respond to the reallocation itself.

Column (4) turns to repurchases, which behave differently. Outflow-induced trading pressure is strongly positively associated with repurchases, whereas the inflow-induced component is smaller and statistically insignificant. Because the outflow component is, by construction, the absolute value of negative side of *Price Pressure*, this asymmetry is what a price-based response looks like: outflows depress prices and improve the terms on which a firm can buy back its own shares, while inflows do the opposite. Repurchases thus track the price consequences of flows, consistent with a market timing motive, while dividends track the reallocation.[6]

If firms respond to reallocation, they should respond most where reallocation is greatest. Section 3 shows that reallocation rises with the magnitude of flows, so that is among funds with large flows. Table 4 tests this prediction directly by splitting *Trading Pressure* into a component attributable to funds with extreme flows, defined as quarterly flows above the 90th or below the 10th percentile of the flow distribution in that quarter, and a component attributable to funds with normal-range flows. Column (1) includes only the extreme component, Column (2) only the normal-range component, and Column (3) both. The extreme component is positive and significant at the 1% level in every specification, while the normal-range component is indistinguishable from zero. The dividend response is concentrated where flows are large enough to disrupt existing allocations.

Column (4) decomposes each component by the direction of flows. Both extreme inflow- and extreme outflow-induced pressure are positive and significant, and neither normal-range component is. The symmetry documented in the pooled specification above holds within extreme flows and is absent outside them, which is what the reallocation interpretation predicts.

A further test comes from the identity of the funds generating the pressure rather than the size of their flows. Passive funds accommodate flows by scaling existing positions, so their flows do not open the window of active reallocation that motivates the analysis. If firms respond to reallocation rather than to other effects of flows, the symmetry documented above should be a feature of active flows alone. Table A6 shows this pattern. Trading pressure from active funds raises dividends following both inflows and outflows. By contrast, pressure from passive funds produces an asymmetric response. The outflow component is positive and significant while the inflow component is indistinguishable from zero. The symmetry that distinguishes reallocation from price pressure

[6]Untabulated results confirm this interpretation directly. Regressing repurchases on *Price Pressure* in place of *Trading Pressure* yields a negative and statistically significant coefficient, so firms repurchase more when their shareholders' flows impose net selling pressure on the stock.

appears precisely where reallocation is possible, and disappears where it is not.[7]

4.3 The Timing of Dividend Announcements

If firms deliberately adjust dividends around periods of reallocation, the response should show up in the timing of announcements and not only in annual dividend levels. Table 5 examines this at the quarterly frequency. The dependent variable is an indicator for whether the firm announces a dividend in quarter q, regressed on $Trading\ Pressure$ in quarters q through $q-3$. The specification includes firm $\times$ year and country $\times$ industry $\times$ year-quarter fixed effects, so the estimates are identified from variation within a firm-year in which quarter the announcement falls.

Column (1) shows that exposure in the immediately preceding quarter predicts an announcement: a one-standard-deviation increase in $Trading\ Pressure_{q-1}$ raises the probability of an announcement by 0.29 percentage points, significant at the 1% level. Exposure in the contemporaneous quarter is positive but smaller and insignificant, and exposure two and three quarters earlier is essentially zero. The one-quarter lag is what a deliberate response looks like.[8] A mechanical or spurious correlation between flows and payout would not produce a response concentrated at exactly one lag and absent at all others.

Columns (2) through (4) separate announcements by the dividend change they accompany. Announcements are classified by whether the firm's dividend for the fiscal year is higher than, equal to, or lower than its dividend in the prior year, and each column restricts the sample to announcements of the corresponding type. The effect is driven by announcements of dividend increases, where a one-standard-deviation increase in lagged exposure raises the announcement probability by 0.52 percentage points. Announcements that leave the dividend unchanged show a coefficient of essentially zero, and announcements of dividend decreases show no significant relation. Firms exposed to large flows are not simply announcing more often; they are announcing increases.

Overall, the results in this section suggest that firms increase dividends in response to the reallocation that large flows induce. Three patterns support this interpretation. First, firms exposed to large flows among their mutual fund shareholders pay higher dividends. Second, the response is symmetric across inflows and outflows. Third, the response is concentrated among dividend increases announced in the quarter immediately following

[7]The estimates from passive funds resemble the repurchase pattern in Column (4) of Table 3, which is what a price-based response looks like. This is consistent with passive outflows generating mechanical selling pressure. Why dividends would respond to price is a separate question that this paper does not take up.

[8]The contemporaneous coefficient is in any case not the sharpest test of timing, since $Trading\ Pressure_q$ aggregates flows over the entire quarter and so may include flows realized after the announcement date. Dividend decisions also require board approval and time to prepare, so the response to a flow shock is more likely to appear in the following quarter than in the same one.

the flow.

5 Evidence from the Morningstar Globe Rating

The evidence in Section 4 is consistent with firms timing dividend increases to periods of portfolio reallocation, but it does not establish a causal relation. Fund flows are not randomly assigned. They are associated with past fund performance and may therefore be correlated with the characteristics of the firms a fund holds, so that flow exposure and dividend policy could be jointly determined by an omitted factor. This section addresses that concern by exploiting a shock that moves fund flows for reasons unrelated to the fundamentals of the funds' portfolio firms.

On March 1, 2016, Morningstar introduced its sustainability rating system, assigning a discrete number of "Globes," ranging from 1 to 5, to more than 20,000 mutual funds representing over $8 trillion in aggregate assets under management. The ratings were constructed from pre-existing portfolio holdings and historical firm-level sustainability scores from Sustainalytics. As a result, the public release of these visual ratings altered investor perceptions and capital allocation without any contemporaneous change in the fundamentals of either the funds or the firms they hold, which is what makes the introduction a plausibly exogenous shock to fund flows. The flow responses are economically meaningful: funds receiving the highest rating (Five Globes) experience substantial net inflows, whereas funds receiving the lowest rating (One Globe) experience significant net outflows (Hartzmark and Sussman, 2019). This two-sided response is what makes the setting well suited to my question. The rating introduction generates inflow and outflow shocks within a single event, allowing me to test the symmetry of the dividend response while holding the source of variation fixed.

Implementing this strategy requires fund-level sustainability ratings around the 2016 introduction. Morningstar currently provides ratings only from 2018 onward, because the methodology was revised in 2018 and earlier ratings are no longer publicly available.[9] Thus, I assign each fund its earliest available rating. This approach assumes that funds did not substantially alter their underlying sustainability strategies in response to the methodological revision, an assumption supported by Gantchev et al. (2024), who find little evidence that funds strategically adjust their behavior when the rating methodology changes.[10]

[9] The 2018 revision introduced several methodological changes, including the incorporation of historical portfolio sustainability scores, the expansion of peer comparison groups, and the introduction of a 1% buffer zone for rating upgrades and downgrades. Under this buffer rule, a fund's score must move at least 1% beyond the rating threshold for a rating change to occur. These changes are intended to reduce incentives for short-term manipulation of sustainability ratings.

[10] Table A3 confirms that this assignment recovers the shock. Columns (1) and (2) show that, relative to other funds, five-globe funds receive significantly larger flows after 2016:Q1 while one-globe funds experience significant outflows, reproducing the pattern in Hartzmark and Sussman (2019). Columns

I construct the treatment and control groups from firms' ownership structure immediately prior to the shock, measured in 2015:Q4. The treatment group consists of firms in the top quartile of ownership by either five-globe or one-globe funds. Firms with greater pre-shock ownership by these funds are more exposed to the flow shocks generated by the rating introduction. Pooling the two groups is motivated by the evidence in Figure 1 and Table 2, which shows that active portfolio reallocation is closely related to the magnitude of flows rather than their direction. I also estimate the effect separately for firms exposed to five-globe funds and firms exposed to one-globe funds, which tests whether the dividend response is symmetric across inflow- and outflow-driven reallocation. The control group consists of firms without substantial ex-ante ownership by either one-globe or five-globe funds.

Using these groups, I estimate the following difference-in-differences (DiD) specification:

$$Dividend_{s,t} = \beta\ Treat_s \times Post_t + \Gamma'(\bar{X}_{s,pre} \times \tau_t) + \alpha_s + \alpha_{c,i,t} + \varepsilon_{s,t} \tag{6}$$

where $Dividend_{s,t}$ denotes dividends for firm s in fiscal year t, scaled by beginning-of-period total assets. $Treat_s$ is an indicator equal to one for firms in the treatment group and zero otherwise, and $Post_t$ is an indicator equal to one for fiscal years after 2015 and zero otherwise. The control variables are the firm characteristics used in Table 3, averaged over the 2013 to 2015 period and interacted with year dummies, which allows observable pre-event characteristics to have differential effects on dividends over the event window. The specification includes firm fixed effects and country $\times$ industry $\times$ year fixed effects. Standard errors are two-way clustered at the firm and country $\times$ industry $\times$ year levels.

The event window spans the two fiscal years before the introduction (2014 and 2015) and the three fiscal years after it (2016 through 2018). Fiscal year 2016 is assigned to the post period because the ratings were released in March 2016, early enough for dividend decisions during that fiscal year to respond. Table 5 supports this timing. Firms adjust dividend announcements in the quarter immediately following a flow shock, so a shock realized in the first quarter of 2016 falls well within the window over which year 2016 dividends are set. The coefficient of interest is β, which captures the differential change in dividends for treated firms following the rating introduction. Consistent with the panel evidence, the predicted sign of β is positive.

Table 6 reports the DiD results. In Column (1), $Treat_s \times Post_t$ is positive and significant at the 1% level. Treated firms raise dividends by 0.24 percentage points of assets relative to control firms, an economically meaningful adjustment for a payout policy that firms are reluctant to revise (Lintner, 1956; Brav et al., 2005). Column (2) replaces $Post_t$ with year-specific indicators, where Pre_{2015} denotes the year before the

(3) and (4) further show that both groups are about 2.3 percentage points more likely to fall in the top quintile of the ratio of discretionary trading to total trading after the introduction, which is consistent with the ratings prompting the same kind of portfolio reassessment documented in Section 3.

introduction and $Post_{2016}$, $Post_{2017}$, and $Post_{2018}$ denote the year of the introduction and the two years that follow. The coefficient on $Treat \times Pre_{2015}$ is small and statistically insignificant, providing no evidence of differential pre-trends and supporting the parallel trends assumption. The three post-treatment coefficients are all positive, significant at the 1% level, and similar in size, moving from 0.0023 in 2016 to 0.0028 in 2017 and 2018. As anticipated in the design of the event window, the response is already present in the year of the introduction, and it persists thereafter.[11]

Column (3) estimates the effect separately for the inflow and outflow shocks by splitting the treatment group into firms whose ownership by five-globe funds is in the top quartile and firms whose ownership by one-globe funds is in the top quartile, so that the former captures exposure to funds receiving inflows and the latter to funds experiencing outflows. Both coefficients are positive and significant, at 0.0016 and 0.0020 respectively. Dividends increase whether the shock to a firm's shareholder base is an inflow or an outflow, mirroring the symmetry in Column (3) of Table 3. What the two groups share is not the direction of the shock, which moves prices in opposite ways, but their shareholders' reassessment of portfolios. Firms raise dividends when that reassessment is under way. Furthermore, Table A4 traces the dynamics separately for the two groups and shows that neither displays a differential pre-trend.

Taken together, the evidence in this section supports a causal interpretation of the panel results: firms respond to flow-driven portfolio reassessments by increasing their dividends. Firms whose shareholders are most exposed to the rating-induced flow shocks raise dividends relative to control firms, and the effect appears in the year of the shock and persists thereafter. The response is symmetric across the inflow and outflow shocks, which points to the reassessment itself rather than its direction as what firms are responding to. Why firms respond in this way is the question I turn to next.

6 Why Do Firms Increase Dividends?

Sections 4 and 5 establish that firms increase dividends when their shareholders are reconsidering their portfolios. This section asks why. Two channels in the payout literature could produce such a response. Under a *catering* channel, firms raise dividends to satisfy the dividend preferences of their shareholder base, and time the increase to a window in which capital is more likely to move in response. Under a *governance* channel, active rebalancing intensifies monitoring and makes the threat of exit more likely to be exercised, and dividends serve as a commitment device that reduces the free cash flow available for

[11] Table A5 shows that the increase is reflected in dividend decisions to raise or initiate a dividend. Among firms that were paying dividends as of 2015, treated firms are 5.1 percentage points more likely to raise their dividend in the year of the introduction, and among firms that were not paying, treated firms are 5.2 percentage points more likely to initiate a dividend in 2017. Consistent with Column (2), the effects appear only in the post-introduction years.

value-destroying investment. The two are not mutually exclusive, but they carry distinct cross-sectional predictions. Catering predicts a stronger response where the dividend preferences of the shareholder base are stronger, or where current payout deviates more from what those preferences imply. Governance predicts a stronger response where free cash flow problems are more severe.

I test both channels within the difference-in-differences framework of Section 5. Each specification interacts $Treat \times Post$ with an indicator for the group in which the channel predicts a larger effect. All controls and fixed effects are further interacted with the group indicator, so the treatment effect is effectively estimated separately within each group and the interaction term reports the difference between them. Because every group indicator is constructed from characteristics measured as of 2015, sorting into groups is fixed before the rating introduction and cannot itself respond to the shock.

6.1 The Catering Channel

Catering theory holds that firms adjust payout policy in response to investor demand for dividends. They initiate dividends when the market prices a premium on payers (Baker and Wurgler, 2004), adjust the level of dividends in the same direction (Li and Lie, 2006), and tilt payout toward the revealed preferences of the particular investors who hold their shares (Becker et al., 2011; Golubov et al., 2020; Manconi and Massa, 2013). This demand is not uniform across investors. It varies with the regulatory and prudential constraints an investor faces (Allen et al., 2000; Grinstein and Michaely, 2005), with strategic motives (Harris et al., 2015), with tax status (Desai and Jin, 2011), and with age (Graham and Kumar, 2006).

What makes catering worth its cost is that shareholders' preferences translate into capital allocation. This is why the timing of catering matters. Portfolio weights are persistent, and even sophisticated investors cannot continuously reconsider every position they hold (Schmidt, 2019). When weights are simply carried forward, a dividend increase may register with shareholders without changing what they own. When large flows force managers to decide which positions to expand, trim, or exit, the same dividend increase enters a decision that is actually being made. Section 3 shows that reallocation intensifies in exactly these windows, and Sections 4 and 5 show that dividends rise in them. If this pattern reflects catering, the response should be concentrated among firms for which satisfying the dividend preferences of their shareholder base is most valuable. I construct three proxies for that incentive.

The first is ownership by dividend-oriented funds, defined as equity funds whose names contain "dividend," "income," or "yield." These are the shareholders whose allocation decisions weight payout most heavily. For a firm whose shareholder base is tilted toward them, a dividend increase during a reallocation window is more likely to be rewarded with capital. Column (1) of Table 7 reports the result. The interaction with $D(High\ Own_{Dividend\ Funds})$ is 0.0033 and significant at the 5% level. Firms with a strong dividend clientele raise dividends by an additional 0.33 percentage points of assets relative to firms without one. The response among such firms is roughly four times as large as elsewhere.

The second proxy exploits the demographic composition of the fund's domicile. Older investors exhibit a stronger preference for dividends (Graham and Kumar, 2006), and firms whose local investor base skews older are more likely to pay them (Becker et al., 2011). Following the United Nations, I classify a country as having an older population if at least 14% of its residents are aged 65 or over. I then sort firms on the share of their mutual fund ownership held by funds domiciled in such countries. One advantage of this proxy is that a country's age structure is unrelated to the characteristics of any individual portfolio firm, which addresses the concern that dividend-oriented funds sort into firms already inclined to raise dividends. Column (2) shows the same pattern. The interaction with $D(High\ Own_{Older\ Populations})$ is 0.0022 and significant at the 10% level.

The third proxy measures how far a firm's payout currently sits from what its shareholders want. Following Manconi and Massa (2013), I construct a catering index, $CI = -|d - D|$, where d is the firm's actual payout and D is the holdings-weighted average of the revealed payout preferences of the mutual funds holding its stock. A low value of CI indicates a large gap between actual and target payout, and hence an unmet demand that a dividend adjustment could close. Column (3) shows that the response is significantly stronger among low-CI firms, with an interaction of 0.0028. However, a gap creates an incentive to raise dividends only if the shareholder base wants dividends in the first place. Column (4) sharpens the test by restricting the sample to firms whose shareholder base has a high target dividend. Here the base effect falls to 0.0001 and is indistinguishable from zero, while the interaction with $D(Low\ CI)$ remains at 0.0029 and significant. Among firms facing a dividend-seeking shareholder base, the entire dividend response is concentrated in those that were falling short of it.

The three tests point the same way. The dividend response during reallocation windows is significantly stronger among firms whose shareholders reward dividends and whose payout falls short of what those shareholders prefer. What varies across groups is not how much a firm pays, but how much it stands to gain from paying more when its shareholders are deciding where to put their capital. This is what catering predicts, and timing is what makes it worth doing: the same increase would do less for a firm whose shareholders are not revisiting their portfolios.

6.2 The Governance Channel

The leading alternative is that dividends rise during reallocation windows for governance reasons. In the agency view of payout, distributing cash reduces managerial discretion over free cash flow and limits overinvestment in negative-NPV projects (Jensen, 1986), and commits the firm to returning to external capital markets, where managers face additional scrutiny (Easterbrook, 1984). Large flows plausibly strengthen these forces. When managers are actively reviewing which positions to hold, portfolio firms come under closer examination and the threat of exit becomes more likely to be exercised, which is itself a disciplining device (Edmans, 2009; McCahery et al., 2016). A firm anticipating this scrutiny may raise its dividend as a commitment not to waste the cash. The observable implication is that the response should be concentrated among firms where free cash flow problems are most severe.

I use two sets of proxies. The first captures how much cash is available for managers to spend. Highly levered firms are already disciplined by debt service, so agency problems from free cash flow are weaker among them; low leverage therefore indicates a greater problem. Large cash balances and high free cash flow, measured as operating cash flow net of investment, indicate greater discretionary resources. The second set captures investment opportunities, since retaining cash is harder to justify when profitable uses for it are scarce. Here I use the market-to-book ratio, sales growth, and realized investment, with low values indicating limited opportunities. If governance drives the dividend response, it should be stronger among firms with low leverage, high cash, high free cash flow, low market-to-book, low sales growth, and low investment.

Table 8 shows that it is not. None of the six interaction terms is statistically significant. The point estimates are also small, and all three proxies for investment opportunities carry the wrong sign: the interactions with $D(\mathit{Low\ M/B})$, $D(\mathit{Low\ Sales\ Growth})$, and $D(\mathit{Low\ Investment})$ are negative, indicating if anything a weaker response among firms with limited investment opportunities. Furthermore, this is not a matter of statistical power. The interaction standard errors in Table 8, between 0.0012 and 0.0013, are essentially the same as those in Table 7, where the same design detects significant heterogeneity. The evidence therefore points to catering rather than governance as the reason firms time dividend increases to reallocation windows.

7 Fund Responses to Dividend Increases

Section 6 concludes that firms time dividend increases to reallocation windows in order to influence where their shareholders put their capital. That interpretation leaves open whether the influence materializes. If firms are reading the situation correctly, funds that are reconsidering their portfolios should tilt toward firms that raise dividends. This section tests that directly.

The test uses a fund-firm-quarter panel built from the funds whose flows are moved by the rating introduction, namely those receiving five globes and those receiving one globe. These are the funds that are reconsidering their portfolios, so they are where a response to dividend increases should appear. I estimate

$$\begin{aligned} Trading_{f,s,q} = {} & \beta_1 Post_{>2016} \times I(\Delta Dividend_{2015-2016} > 0) \\ & + \beta_2 Treat_s \times Post_{>2016} \times I(\Delta Dividend_{2015-2016} > 0) \\ & + \Gamma'(\bar{X}_{s,pre} \times \tau_q) + \alpha_s + \alpha_{f,q} + \alpha_{Treat \times Post} + \varepsilon_{f,s,q} \end{aligned}$$

where $Trading_{f,s,q}$ is fund f's quarterly trading in stock s, scaled by the firm's lagged shares outstanding. $Treat_s$ identifies the treated firms of Table 6, those most exposed to the rating-induced flow shocks. $I(\Delta Dividend_{2015-2016} > 0)$ equals one for firms that raised their dividend between 2015 and 2016, the increases documented in Section 5. $Post_{>2016}$ equals one for quarters after the end of firm s's 2016 fiscal year. Because fiscal year ends differ across firms, the indicator switches on at different calendar dates, which is deliberate: trading is counted as post-dividend only once the firm's dividend is settled and public. The specification includes firm fixed effects and fund $\times$ year-quarter fixed effects. I also include $Treat \times Post$ fixed effects to control for any differential change in trading toward treated firms after the shock that is unrelated to their dividend decisions. Following Table 6, pre-event average firm characteristics interacted with year-quarter dummies are also included. Standard errors are two-way clustered at the firm and country $\times$ industry $\times$ year levels.

The coefficient of interest is β_2. It asks whether, among the firms whose shareholders are reallocating, those that raise dividends are bought more heavily than those that do not, relative to the same comparison among control firms. Because the fund $\times$ year-quarter fixed effects absorb the fund's aggregate response to its own flows, β_2 is identified from how a fund allocates across firms within its portfolio at a moment when it is deciding which positions to expand, trim, or exit.

Table 9 reports the results. In Column (1), which pools five-globe and one-globe funds, the triple interaction is 0.0030 and significant at the 1% level. Funds facing the rating-induced flow shock trade toward treated firms that raise dividends, buying an additional 0.3% of shares outstanding per quarter. This finding shows that the dividend increases documented in Section 5 do not merely coincide with reallocation windows, but also translate into capital allocation.

Columns (2) and (3) estimate the effect separately for five-globe and one-globe funds, and this is where the result bears most directly on the argument. The triple interaction is positive and significant in both, at 0.0056 for funds receiving inflows and 0.0025 for funds experiencing outflows. Since the two groups face opposite shocks, they make different decisions. A fund with new capital chooses where to put it, while a fund facing redemptions chooses what to sell and what to keep. Firms that raise dividends are treated better in both cases. A dividend increase during a reallocation window thus does two things at once, attracting capital from funds that have it to deploy and retaining capital in funds that are deciding what to give up.

Taken with Sections 5 and 6, the evidence suggests a strategic interaction. Large flows force fund managers to revisit their portfolios. Firms whose shareholders are in that position raise dividends, and they do so to cater to their shareholders' preference for dividends. Funds then allocate toward the firms that raised dividends. Each side responds to the other, and the timing is what links the two.

8 Conclusion

This paper asks when firms cater to their shareholders' dividend preferences. If firms cater in order to influence where shareholders allocate their capital, catering should be most valuable when shareholders are actively deciding on that allocation. Portfolio weights tend to be persistent, so shareholders are not always doing so. I identify the periods in which they are, using large mutual fund flows. Using an international sample of equity mutual funds and listed firms over 2000-2021, I first document that fund managers deviate further from proportional flow allocation as flows grow larger, and that they do so following both inflows and outflows. Large flows therefore mark windows in which portfolio weights are actively revisited.

Firms increase dividends in these windows. Exposure to large flows among a firm's mutual fund shareholders predicts higher dividends, and the response is concentrated among firms exposed to extreme flows. The response is symmetric across inflows and outflows. This symmetry suggests that what firms respond to is the flow-induced reassessment of portfolios, not the direction in which the flows run. These dividend increases are announced in the quarter immediately following the flow. A difference-in-differences design exploiting the 2016 introduction of Morningstar Sustainability Ratings supports a causal interpretation.

The cross-sectional evidence speaks to catering rather than governance. The response is stronger among firms with greater ownership by dividend-oriented funds, greater ownership by funds domiciled in countries with older populations, and a larger gap between actual dividends and what their shareholders' revealed preferences imply. It is not stronger among firms with more severe free cash flow problems. Funds then act on these increases: following the rating release, both funds receiving inflows and funds facing outflows trade toward firms that raised dividends, so the same dividend increase both attracts new capital and retains existing capital.

These findings establish shareholders' portfolio reallocation as a distinct dimension of catering. Existing work identifies catering from variation in market conditions or in the identity of the investor. Both concern the preferences firms cater to, but neither concerns whether shareholders are in a position to act on them. More broadly, firms are not passive recipients of investor capital but participants in a strategic interaction whose responses feed back into investor portfolio decisions.

References

Allen, F., Bernardo, A. E., & Welch, I. (2000). A theory of dividends based on tax clienteles. *The Journal of Finance, 55*(6), 2499–2536.

Baker, M., & Wurgler, J. (2004). A catering theory of dividends. *The Journal of Finance, 59*(3), 1125–1165.

Becker, B., Ivković, Z., & Weisbenner, S. (2011). Local dividend clienteles. *The Journal of Finance*, 66(2), 655–683.

Berger, E. A. (2023). Selection bias in mutual fund fire sales. *Journal of Financial and Quantitative Analysis, 58*(3), 1039–1077.

Brav, A., Graham, J. R., Harvey, C. R., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics, 77*(3), 483–527.

Chetty, R., & Saez, E. (2005). Dividend taxes and corporate behavior: Evidence from the 2003 dividend tax cut. *The Quarterly Journal of Economics*, 120(3), 791–833.

Coval, J., & Stafford, E. (2007). Asset fire sales (and purchases) in equity markets. *Journal of Financial Economics*, 86(2), 479–512.

Desai, M. A., & Jin, L. (2011). Institutional tax clienteles and payout policy. *Journal of Financial Economics*, 100(1), 68–84.

Easterbrook, F. H. (1984). Two agency-cost explanations of dividends. *The American Economic Review, 74*(4), 650–659.

Edmans, A. (2009). Blockholder trading, market efficiency, and managerial myopia. *The Journal of Finance*, 64(6), 2481–2513.

Edmans, A., Goldstein, I., & Jiang, W. (2012). The real effects of financial markets: The impact of prices on takeovers. *The Journal of Finance, 67*(3), 933–971.

Elton, E. J., Gruber, M. J., & Blake, C. R. (2001). A first look at the accuracy of the CRSP mutual fund database and a comparison of the CRSP and Morningstar mutual fund databases. *The Journal of Finance, 56*(6), 2415–2430.

Evans, R. B. (2010). Mutual fund incubation. *The Journal of Finance, 65*(4), 1581–1611.

Friberg, R., Goldstein, I., & Hankins, K. W. (2024). Corporate responses to stock price fragility. *Journal of Financial Economics, 153*, 103795.

Gantchev, N., Giannetti, M., & Li, R. (2024). Sustainability or performance? Ratings and fund managers' incentives. *Journal of Financial Economics, 155*, 103831.

Golubov, A., Lasfer, M., & Vitkova, V. (2020). Active catering to dividend clienteles: Evidence from takeovers. *Journal of Financial Economics*, 137(3), 815-836.

Graham, J. R., & Kumar, A. (2006). Do dividend clienteles exist? Evidence on dividend preferences of retail investors. *The Journal of Finance*, 61(3), 1305-1336.

Grinstein, Y., & Michaely, R. (2005). Institutional holdings and payout policy. *The Journal of Finance*, 60(3), 1389-1426.

Hanlon, M., & Hoopes, J. L. (2014). What do firms do when dividend tax rates change? An examination of alternative payout responses. *Journal of Financial Economics*, 114(1), 105-124.

Harris, L. E., Hartzmark, S. M., & Solomon, D. H. (2015). Juicing the dividend yield: Mutual funds and the demand for dividends. *Journal of Financial Economics*, 116(3), 433-451.

Hartzmark, S. M., & Sussman, A. B. (2019). Do investors value sustainability? A natural experiment examining ranking and fund flows. *The Journal of Finance, 74*(6), 2789–2837.

Ince, O. S., & Porter, R. B. (2006). Individual equity return data from Thomson Datastream: Handle with care! *Journal of Financial Research, 29*(4), 463–479.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review, 76*(2), 323–329.

Khan, M., Kogan, L., & Serafeim, G. (2012). Mutual fund trading pressure: Firm-level stock price impact and timing of SEOs. *The Journal of Finance, 67*(4), 1371–1395.

Li, W., & Lie, E. (2006). Dividend changes and catering incentives. *Journal of Financial Economics*, 80(2), 293-308.

Lintner, J. (1956). Distribution of incomes of corporations among dividends, retained earnings, and taxes. *The American Economic Review, 46*(2), 97–113.

Lou, D. (2012). A flow-based explanation for return predictability. *The Review of Financial Studies, 25*(12), 3457–3489.

Lou, X., & Wang, A. Y. (2018). Flow-induced trading pressure and corporate investment. *Journal of Financial and Quantitative Analysis, 53*(1), 171–201.

Manconi, A., & Massa, M. (2013). A servant to many masters: Competing shareholder preferences and limits to catering. *Journal of Financial and Quantitative Analysis,* 48(6), 1693-1716.

Massa, M., Schumacher, D., & Wang, Y. (2021). Who is afraid of BlackRock? *The Review of Financial Studies, 34*(4), 1987–2044.

Massa, M., Schumacher, D., & Wang, Y. (2025). Repurchases for price impact: Evidence from fragile stocks. *Journal of Financial and Quantitative Analysis.*

McCahery, J. A., Sautner, Z., & Starks, L. T. (2016). Behind the scenes: The corporate governance preferences of institutional investors. *The Journal of Finance, 71*(6), 2905–2932.

Morningstar. (2015). How flows affect your fund. https://www.morningstar.com/funds/how-flows-affect-your-fund

Morningstar. (2017). Flows + bloat = headaches for funds. https://www.morningstar.com/funds/flows-bloat-headaches-funds

Pinkowitz, L., Stulz, R. M., & Williamson, R. (2016). Do U.S. firms hold more cash than foreign firms do? *The Review of Financial Studies, 29*(2), 309–348.

Schmidt, D. (2019). Distracted institutional investors. *Journal of Financial and Quantitative Analysis, 54*(6), 2453–2491.

Wardlaw, M. (2020). Measuring mutual fund flow pressure as shock to stock returns. *The Journal of Finance, 75*(6), 3221–3243.

Figure 1: Net Fund Flows and Discretionary Trading

Figure 1 plots average discretionary trading intensity, scaled by total net assets, across terciles of net fund flows. Fund-quarters are sorted into terciles by net flows, with "Low" denoting the bottom third of the flow distribution and "High" the top third.

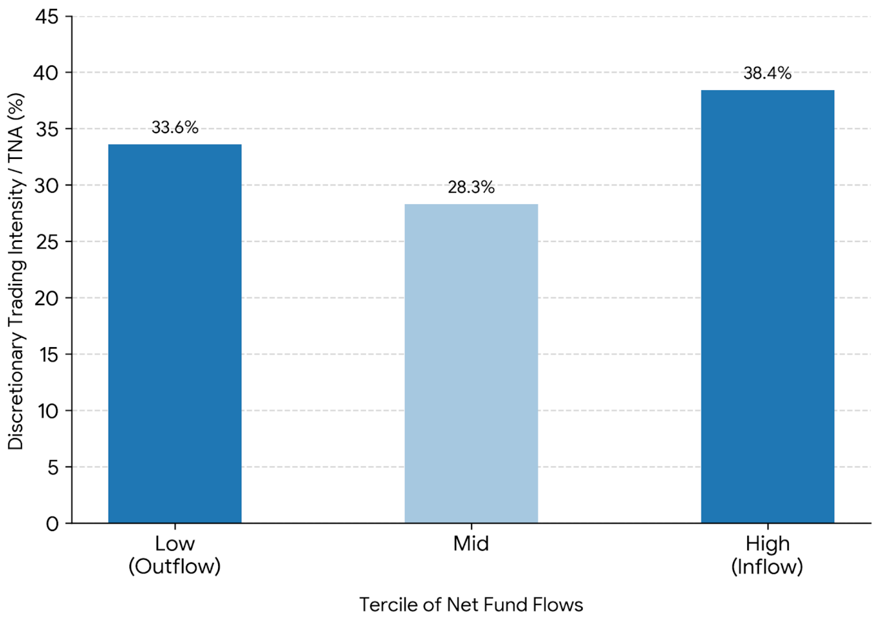

Table 1: Summary Statistics

Table 1 reports the summary statistics for the funds and firms used in the panel regressions. I report the mean, standard deviation, 25th percentile (P25), median, and 75th percentile (P75) for each variable. Panel A presents the summary statistics for funds. The fund sample consists of actively managed equity funds with total net assets of at least \$15 million and at least three years of history. Panel B presents the summary statistics for the firm sample, excluding all financial (SIC 6000–6999) and utilities (SIC 4900–4999) companies. Variable definitions are provided in Table A1. The sample period spans from 2000 to 2021. All continuous variables are winsorized at the 1% level in both tails.

Panel A: Fund Sample						
	Obs	Mean	STD	P25	Median	P75
DTI (\$bil)	500,195	0.2009	0.4788	0.0112	0.0419	0.1553
$\ln(DTI)$	500,195	-3.2365	1.9872	-4.4959	-3.1730	-1.8622
$Flow$	500,195	-0.0042	0.1274	-0.0516	-0.0188	0.0179
$\|Flow\|$	500,195	0.0764	0.1114	0.0186	0.0406	0.0840
TNA (\$bil)	500,195	0.7603	1.7422	0.0619	0.1824	0.6027
$Return$	500,195	0.0267	0.1011	-0.0193	0.0336	0.0835
Age (years)	500,195	15.1691	10.3654	8	13	19.75
Panel B: Firm Sample						
	Obs	Mean	STD	P25	Median	P75
$Dividend$	147,110	0.0196	0.0318	0	0.0087	0.0237
$Repurchase$	147,110	0.0087	0.0263	0	0	0.0015
$Trading\ Pressure$	147,110	0.0166	0.0200	0.0016	0.0082	0.0254
$Price\ Pressure$	147,110	-0.0015	0.0113	-0.0046	-0.0002	0.0010
$Assets$ (\$bil)	147,110	3.2700	8.6603	0.2107	0.6090	2.0604
$Debt$	147,110	0.2217	0.2021	0.0413	0.1859	0.3434
M/B	147,110	2.5677	3.0200	0.9229	1.6038	2.9316
ROE	147,110	0.0486	0.2784	0.0186	0.0836	0.1576
IO	147,110	0.1670	0.1599	0.0373	0.1112	0.2575
$Cash$	147,110	0.2094	0.2104	0.0646	0.1437	0.2798
$Intangible$	147,110	0.1321	0.2023	0.0057	0.0338	0.1758
$Investment$	147,110	0.0814	0.0890	0.0248	0.0542	0.1038
$SGA/Sale$	147,110	0.3498	0.7917	0.1025	0.1897	0.3364

Table 2: Absolute Fund Flows and Discretionary Trading Intensity

Table 2 presents the results of regressions examining the relation between Discretionary Trading Intensity (DTI) and the magnitude of fund flows. DTI is defined as the sum of the absolute deviations of actual trading from hypothetical trading in which fund flows are allocated proportionally to existing portfolio weights. The dependent variable is the natural logarithm of DTI in Columns (1)–(3) and the natural logarithm of DTI scaled by beginning-of-period total net assets (TNA) in Columns (4)–(5). Section 3 describes the measure in more detail. The key independent variable, $|Flow|_t$, is the absolute value of net fund flows during the quarter. Control variables are lagged fund size ($\ln(TNA)_{t-1}$) and lagged fund returns ($Return_{t-1}$). Column (1) uses the full sample, Columns (2) and (4) restrict to fund-quarters with positive flows, and Columns (3) and (5) to those with negative flows. All specifications include fund and category $\times$ year-quarter fixed effects. Standard errors are two-way clustered at the fund and category $\times$ year-quarter levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	$\ln(DTI)$			$\ln(DTI/TNA)$	
Sample	Full	$Flow > 0$	$Flow < 0$	$Flow > 0$	$Flow < 0$
	(1)	(2)	(3)	(4)	(5)
$\|Flow\|_t$	2.4896***	2.6741***	1.8270***	2.5959***	1.8172***
	(0.0319)	(0.0301)	(0.0476)	(0.0273)	(0.0471)
$\ln(TNA)_{t-1}$	0.8859***	0.8797***	0.9057***	-0.0974***	-0.0794***
	(0.0052)	(0.0067)	(0.0060)	(0.0059)	(0.0055)
$Return_{t-1}$	-0.1770***	-0.1199	-0.4825***	-0.0755	-0.4739***
	(0.0663)	(0.0953)	(0.0788)	(0.0941)	(0.0787)
Observations	500,195	168,931	329,748	168,931	329,748
Adjusted R-squared	0.7278	0.7246	0.7353	0.3887	0.3272
Fund FE	Y	Y	Y	Y	Y
Category $\times$ Year-Quarter FE	Y	Y	Y	Y	Y

Table 3: Flow-induced Trading Pressure and Payout Policy

Table 3 reports regression estimates of the relation between flow-induced trading pressure and corporate payout policy for the global sample of firms from Worldscope. The dependent variable is either *Dividend* (Columns (1)–(3)) or *Repurchase* (Column (4)). The key independent variables are measures of firm-level exposure to mutual fund flows. Specifically, *Trading Pressure* (*Price Pressure*) is calculated as the sum, across the firm's mutual fund shareholders, of the product of each fund's lagged holdings in the firm and the absolute (signed) value of its net flows, scaled by the firm's lagged shares outstanding. Section 4.1 provides a detailed description of these measures. All pressure measures are standardized to have a mean of zero and a standard deviation of one. In Columns (3) and (4), *Trading Pressure* is decomposed into $Trading\ Pressure_{inflow}$ and $Trading\ Pressure_{outflow}$ based on the sign of fund flows. All specifications include a set of firm-level controls, as well as firm and country × industry × year fixed effects. Industry classifications follow the Fama-French 48 industries. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Dividend*	*Dividend*	*Dividend*	*Repurchase*
	(1)	(2)	(3)	(4)
Trading Pressure	0.0003**	0.0003**		
	(0.0001)	(0.0001)		
Price Pressure		0.0000		
		(0.0001)		
$Trading\ Pressure_{inflow}$			0.0002**	0.0001
			(0.0001)	(0.0001)
$Trading\ Pressure_{outflow}$			0.0002*	0.0006***
			(0.0001)	(0.0002)
ln (*Assets*)	-0.0002	-0.0002	-0.0002	0.0037***
	(0.0003)	(0.0003)	(0.0003)	(0.0004)
Debt	-0.0197***	-0.0197***	-0.0197***	-0.0164***
	(0.0009)	(0.0009)	(0.0009)	(0.0010)
M/B	0.0011***	0.0011***	0.0011***	0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
ROE	0.0102***	0.0102***	0.0102***	0.0059***
	(0.0005)	(0.0005)	(0.0005)	(0.0005)
IO	0.0076***	0.0076***	0.0073***	-0.0045***
	(0.0015)	(0.0015)	(0.0015)	(0.0017)
Cash	0.0090***	0.0090***	0.0090***	0.0087***
	(0.0008)	(0.0008)	(0.0008)	(0.0009)
Intangible	-0.0052***	-0.0052***	-0.0052***	-0.0105***
	(0.0010)	(0.0010)	(0.0010)	(0.0011)
Investment	-0.0004	-0.0004	-0.0004	-0.0054***
	(0.0016)	(0.0016)	(0.0016)	(0.0015)
SGA/Sale	0.0001	0.0001	0.0001	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Observations	147,110	147,110	147,110	147,110
Adjusted R-squared	0.7259	0.7259	0.7259	0.3893
Firm FE	Y	Y	Y	Y
Country × Industry × Year FE	Y	Y	Y	Y

Table 4: Dividend Responses to Extreme Flow-Induced Trading Pressure

Table 4 examines whether corporate dividend responses to flow-induced trading pressure are concentrated among funds experiencing extreme flows. Columns (1)–(3) decompose *Trading Pressure* into components attributable to funds with extreme flows ($Trading\ Pressure^{extreme}$) and funds with normal-range flows ($Trading\ Pressure^{normal}$). Extreme flows are defined as quarterly fund flows above the 90th or below the 10th percentile of the flow distribution in a given quarter; all remaining flows are classified as normal. Column (4) further decomposes each component by the direction of fund flows. All trading pressure measures are standardized to have a mean of zero and a standard deviation of one. The dependent variable in all columns is dividends, scaled by beginning-of-period total assets. All specifications include a set of firm-level controls, as well as firm and country × industry × year fixed effects. Industry classifications follow the Fama-French 48 industries. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Dividend*			
	(1)	(2)	(3)	(4)
$Trading\ Pressure^{extreme}$	0.0003***		0.0003***	
	(0.0001)		(0.0001)	
$Trading\ Pressure^{normal}$		-0.0000	-0.0001	
		(0.0002)	(0.0002)	
$Trading\ Pressure^{extreme}_{inflow}$				0.0002***
				(0.0001)
$Trading\ Pressure^{extreme}_{outflow}$				0.0003***
				(0.0001)
$Trading\ Pressure^{normal}_{inflow}$				-0.0001
				(0.0001)
$Trading\ Pressure^{normal}_{outflow}$				-0.0001
				(0.0001)
Observations	147,110	147,110	147,110	147,110
Adjusted R-squared	0.7259	0.7259	0.7259	0.7260
Controls	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Country × Industry × Year FE	Y	Y	Y	Y

Table 5: Trading Pressure and Dividend Announcement Timing

Table 5 examines whether firms time their dividend announcements in response to large flows. The dependent variable is an indicator for whether a firm announces a dividend during quarter q, regressed on $Trading\ Pressure$ in quarters q through $q-3$. Column (1) uses the full sample, while Columns (2)–(4) report estimates separately for dividend increases, no dividend changes, and dividend decreases, respectively. $Trading\ Pressure$ is the sum, across the firm's mutual fund shareholders, of each fund's lagged holdings in the firm multiplied by the absolute value of its net flows, scaled by the firm's lagged shares outstanding, and is standardized to have a mean of zero and a standard deviation of one. All specifications include firm × year and country × industry × year-quarter fixed effects. Industry classifications follow the Fama-French 48 industries. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	$1(Dividend\ Announcement)_q$			
Sample	Full	Dividend Increase	No Change	Dividend Decrease
	(1)	(2)	(3)	(4)
$Trading\ Pressure_q$	0.0014	0.0035	0.0000	-0.0017
	(0.0010)	(0.0026)	(0.0001)	(0.0040)
$Trading\ Pressure_{q-1}$	0.0029***	0.0052**	0.0001	0.0033
	(0.0011)	(0.0027)	(0.0001)	(0.0037)
$Trading\ Pressure_{q-2}$	-0.0014	-0.0003	-0.0001	-0.0054
	(0.0011)	(0.0027)	(0.0001)	(0.0038)
$Trading\ Pressure_{q-3}$	-0.0003	-0.0017	-0.0001	-0.0019
	(0.0011)	(0.0027)	(0.0001)	(0.0037)
Observations	552,882	209,103	185,475	126,290
Adjusted R-squared	0.5093	0.4622	0.8721	0.4158
Firm × Year FE	Y	Y	Y	Y
Country × Industry × Year-Quarter FE	Y	Y	Y	Y

Table 6: Difference-in-Differences Estimates of Changes in Dividends

Table 6 presents the results of the difference-in-differences (DiD) analysis examining changes in corporate dividend policy following the introduction of the Morningstar Sustainability Rating. The regression model is specified as follows:

$$Y_{s,t} = \beta\ Treat_s \times Post_t + \Gamma'(\bar{X}_{s,pre} \times \tau_t) + \alpha_s + \alpha_{c,i,t} + \varepsilon_{s,t}$$

where $Y_{s,t}$ denotes dividends for firm s in fiscal year t. The treatment indicator, $Treat_s$, equals one for firms in the top quartile of ownership by either "five-globe" or "one-globe" funds as of December 2015, and zero otherwise. The $Post_t$ variable is an indicator equal to one for the post-event period (2016–2018) and zero for the two years preceding the introduction (2014–2015). To account for potential confounding factors, the model includes a set of pre-event average firm characteristics ($\bar{X}_{s,pre}$ measured over 2013–2015) interacted with year dummies (τ_t). All specifications include firm and country × industry × year fixed effects. In Column (2), I replace $Post_t$ with a set of year-specific indicators – Pre_{2015}, $Post_{2016}$, $Post_{2017}$, and $Post_{2018}$ – to trace the dynamic effects of the rating introduction. In Column (3), the treatment group is split into two: $Treat_{FiveGlobes}$ includes firms in the top quartile of ownership by "five-globe" funds, and $Treat_{OneGlobe}$ includes those in the top quartile of ownership by "one-globe" funds. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable		*Dividend*	
	(1)	(2)	(3)
$Treat \times Post$	0.0024***		
	(0.0006)		
$Treat \times Pre_{2015}$		0.0005	
		(0.0007)	
$Treat \times Post_{2016}$		0.0023***	
		(0.0009)	
$Treat \times Post_{2017}$		0.0028***	
		(0.0009)	
$Treat \times Post_{2018}$		0.0028***	
		(0.0009)	
$Treat_{FiveGlobes} \times Post$			0.0016**
			(0.0007)
$Treat_{OneGlobe} \times Post$			0.0020***
			(0.0006)
Observations	38,133	38,133	38,133
Adjusted R-squared	0.8173	0.8172	0.8173
Pre-event controls × Year	Y	Y	Y
Firm FE	Y	Y	Y
Country × Industry × Year FE	Y	Y	Y

Table 7: Heterogeneity in Dividend Responses: Catering Channel

Table 7 investigates whether the dividend response to the treatment is stronger among firms with high catering incentives. Each specification interacts the treatment effect, $Treat \times Post$, with an indicator for the group of firms with high catering incentives. In Column (1), $D(High\ Own_{Dividend\ Funds})$ equals one for firms with high ownership by dividend funds, defined as equity funds whose names contain "dividend," "income," or "yield." In Column (2), $D(High\ Own_{Older\ Populations})$ equals one for firms with high ownership by funds domiciled in countries with older populations, defined following the United Nations as countries where at least 14% of the population is aged 65 or older. Ownership is measured as the specified fund group's holdings divided by total holdings across both fund groups. In Columns (3) and (4), $D(Low\ CI)$ equals one for firms with a low catering index (CI), constructed following Manconi and Massa (2013). A lower CI indicates that the firm's actual dividend deviates more from the target dividend implied by the dividend preferences of its shareholder base. Column (4) restricts the sample to firms with a high target dividend, for which the shareholder base has strong dividend preferences. A high (low) indicator equals one for firms whose corresponding characteristic, measured as of 2015, is above (below) the sample median, and zero otherwise. All specifications include the pre-event average firm characteristics in Table 6 interacted with year dummies, firm fixed effects and country × industry × year fixed effects, each further interacted with the group indicator. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Dividend*			
Sample	Full	Full	Full	High Target Div
	(1)	(2)	(3)	(4)
$Treat \times Post$	0.0012*	0.0012*	0.0011**	0.0001
	(0.0007)	(0.0007)	(0.0005)	(0.0005)
$\times D(High\ Own_{Dividend\ Funds})$	0.0033**			
	(0.0013)			
$\times D(High\ Own_{Older\ Populations})$		0.0022*		
		(0.0011)		
$\times D(Low\ CI)$			0.0028**	0.0029**
			(0.0012)	(0.0013)
Observations	35,595	35,236	32,495	16,322
Adjusted R-squared	0.8199	0.8220	0.8191	0.8446
Pre-event controls × Year	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Country × Industry × Year FE	Y	Y	Y	Y

Table 8: Heterogeneity in Dividend Responses: Governance Channel

Table 8 examines whether the dividend response to the treatment is stronger among firms with greater free cash flow and weaker investment opportunities, where free cash flow problems are expected to be more severe. Each specification interacts $Treat \times Post$ with an indicator for firms with low leverage (*Low Debt*), high cash holdings ($High\ Cash$), high free cash flow ($High\ FCF$), low market-to-book ratio ($Low\ M/B$), low sales growth ($Low\ Sales\ Growth$), or low investment ($Low\ Investment$). A high (low) indicator equals one for firms whose corresponding characteristic, measured as of 2015, is above (below) the sample median, and zero otherwise. The treatment indicator, $Treat$, equals one for firms in the top quartile of ownership by either five-globe or one-globe funds in 2015, and zero otherwise. The variable $Post$ is an indicator equal to one for the post-event period (2016–2018) and zero for the pre-event period (2014–2015). All specifications include pre-event average firm characteristics in Table 6, interacted with year dummies, as well as firm and country × industry × year fixed effects. All controls and fixed effects are interacted with the group indicator. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Dividend*					
	(1)	(2)	(3)	(4)	(5)	(6)
$Treat \times Post$	0.0031***	0.0023**	0.0022***	0.0029***	0.0026***	0.0031***
	(0.0009)	(0.0009)	(0.0006)	(0.0010)	(0.0009)	(0.0008)
$\times D(Low\ Debt)$	-0.0005					
	(0.0012)					
$\times D(High\ Cash)$		0.0000				
		(0.0012)				
$\times D(High\ FCF)$			0.0010			
			(0.0013)			
$\times D(Low\ M/B)$				-0.0013		
				(0.0013)		
$\times D(Low\ Sales\ Growth)$					-0.0005	
					(0.0012)	
$\times D(Low\ Investment)$						-0.0014
						(0.0012)
Observations	32,630	32,438	32,405	32,560	32,592	32,559
Adjusted R-squared	0.8138	0.8150	0.8163	0.8151	0.8117	0.8152
Pre-event controls × Year	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Country × Industry × Year FE	Y	Y	Y	Y	Y	Y

Table 9: Fund Trading Responses to Dividend Increase after the Rating Introduction

Table 9 reports regression estimates of the impact of dividend increases on funds' trading following the introduction of Morningstar sustainability ratings. The dependent variable, $Trading$, represents quarterly fund trading scaled by the firm's lagged shares outstanding. The treatment indicator, $Treat$, identifies the treated firms in Table 6. $Post_{>2016}$ is an indicator variable equal to one for the quarters following the end of the firm's fiscal year 2016. $I(\Delta Dividend_{2015-2016} > 0)$ is an indicator equal to one if a firm increases its dividend between 2015 and 2016 and zero otherwise. Column (1) pools five-globe and one-globe funds and uses a single treatment indicator, $Treat$. Columns (2) and (3) restrict the sample to five-globe funds and one-globe funds, respectively, and separately estimate the effects for $Treat_{FiveGlobes}$ and $Treat_{OneGlobe}$ groups. The triple interaction term, $Treat \times Post_{>2016} \times I(\Delta Dividend_{2015-2016} > 0)$, captures whether funds exhibit differential trading patterns toward treated firms that increase dividends following the release of ratings. All specifications include firm, fund $\times$ year-quarter, and $Treat \times Post$ fixed effects. Additionally, I control for pre-event average firm characteristics interacted with year-quarter dummies. Standard errors are two-way clustered at the firm and country $\times$ industry $\times$ year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Trading*		
Sample	Five and One	Five	One
	(1)	(2)	(3)
$Post_{>2016} \times I(\Delta Dividend_{2015-2016} > 0)$	-0.0032***	-0.0055***	-0.0023***
	(0.0008)	(0.0016)	(0.0007)
$Treat \times Post_{>2016} \times I(\Delta Dividend_{2015-2016} > 0)$	0.0030***		
	(0.0010)		
$Treat_{FiveGlobes} \times Post_{>2016} \times I(\Delta Dividend_{2015-2016} > 0)$		0.0056***	
		(0.0017)	
$Treat_{OneGlobe} \times Post_{>2016} \times I(\Delta Dividend_{2015-2016} > 0)$			0.0025**
			(0.0012)
Observations	1,256,253	546,946	708,567
Adjusted R-squared	0.0770	0.0760	0.0853
$Treat \times Post$	Y	Y	Y
Pre-event controls × Year-Quarter	Y	Y	Y
Firm FE	Y	Y	Y
Fund × Year-Quarter FE	Y	Y	Y

Table A1: Variable Definitions

Variable	Definition
Panel A: Fund-level Variables	
Flow	The net flow to mutual fund f during quarter q is defined as: $$Flow_{f,q} = \frac{TNA_{f,q} - (1 + Ret_{f,q})TNA_{f,q-1}}{TNA_{f,q-1}}$$
DTI	Discretionary trading intensity. The sum of absolute deviations of actual trading from a hypothetical trading benchmark, where investor flows are allocated proportionally based on existing portfolio weights.
Panel B: Firm-level Variables	
Dividend	Cash dividends scaled by the beginning-of-period total assets.
Repurchase	Share repurchases scaled by the beginning-of-period total assets.
Trading Pressure	The sum of the product of each fund's lagged holdings in the firm and the absolute value of its net flows, scaled by the firm's lagged shares outstanding. $$Trading\ Pressure_{s,q} = \frac{\sum_f Holding_{f,s,q-1} \times \lvert Flow\rvert_{f,q}}{Shares\ Outstanding_{s,q-1}}$$
Price Pressure	The sum of the product of each fund's lagged holdings in the firm and the signed value of its net flows, scaled by the firm's lagged shares outstanding. $$Price\ Pressure_{s,q} = \frac{\sum_f Holding_{f,s,q-1} \times Flow_{f,q}}{Shares\ Outstanding_{s,q-1}}$$
$\ln(Assets)$	The natural logarithm of book value of total assets.
Debt	The sum of long- and short-term debt scaled by the beginning-of-period total assets.
M/B	Market-to-book ratio. The ratio of market value of equity to book value of equity.
ROE	Return on equity.
IO	Institutional ownership. The sum of all institutional holdings in FactSet divided by the number of shares outstanding.
Cash	Total cash holdings divided by the beginning-of-period total assets.
Intangible	Intangible assets divided by the beginning-of-period total assets.
Investment	The sum of capital expenditures and R&D expenditures divided by the beginning-of-period total assets.
SGA/Sale	The ratio of selling, general, and administrative expenses to sales.
FCF	Free cash flow. The difference between operating cash flows and investment.
Sales Growth	Sales growth. Growth rate of net sales.
CI	Catering index in Manconi and Massa (2013). The negative absolute difference between the firm's actual payout (d) and its shareholders' average target payout (D): $CI = -\lvert d - D\rvert$. The target payout (D) is the weighted average of the revealed payout preferences of mutual funds holding the firm's stock, based on their portfolio holdings.

Table A2: Alternative Measures of Discretionary Trading Intensity

Table A2 presents the results of regressions examining the relation between the magnitude of fund flows and three alternative measures of fund discretionary trading intensity. For dependent variables, Panel A uses DTI/TNA, which measures discretionary trading intensity relative to the fund's total net assets. Panel B uses $DTI/SharesOutstanding$, which is constructed by summing, at the fund level, the discretionary trading of each holding scaled by the firm's shares outstanding. Panel C uses an indicator for *High DTI Ratio*, which equals one if the ratio of DTI to the fund's total trading during the quarter is in the top 20 percent of the sample, and zero otherwise. The key independent variable, $|Flow|$, represents the absolute value of net fund flows during the quarter. Columns (1)–(3) report results for the full sample, funds experiencing positive flows, and funds experiencing negative flows, respectively. Control variables are lagged fund size ($\ln(TNA)$) and lagged fund returns (*Return*) as in Table 2. All specifications include fund and category × year-quarter fixed effects. Standard errors are two-way clustered at the fund and category × year-quarter levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Sample	Full Sample	$Flow > 0$	$Flow < 0$
	(1)	(2)	(3)
Panel A: DTI/TNA			
$\|Flow\|$	0.7839***	1.0337***	0.1434***
	(0.0111)	(0.0126)	(0.0105)
Observations	500,201	168,931	329,754
Adjusted R-squared	0.3888	0.4790	0.3530
Panel B: $DTI/SharesOutstanding$			
$\|Flow\|$	1.3077***	1.6759***	0.4349**
	(0.1347)	(0.1716)	(0.1744)
Observations	500,186	168,924	329,746
Adjusted R-squared	0.2152	0.2572	0.2089
Panel C: *High DTI Ratio*			
$\|Flow\|$	0.3622***	0.3937***	0.0605***
	(0.0120)	(0.0137)	(0.0136)
Observations	414,726	138,800	274,081
Adjusted R-squared	0.1913	0.1995	0.2248
Controls	Y	Y	Y
Fund FE	Y	Y	Y
Category × Year-Quarter FE	Y	Y	Y

Table A3: Impact of Globe Rating on Fund Flows and Discretionary Trading

Table A3 reports the effects of the introduction of the Morningstar Sustainability Rating on mutual fund flows and discretionary trading. The dependent variable is net fund flow in Columns (1)–(2) and *High DTI Ratio* in Columns (3)–(4). *High DTI Ratio* equals one if the ratio of *DTI* to the fund's total trading during the quarter is in the top 20 percent of the sample, and zero otherwise. The key independent variables are interaction terms between rating categories (*Five Globes* and *One Globe*) and a $Post_{>2016Q1}$ indicator, which equals one for quarters after the first quarter of 2016 and zero otherwise. Rating categories are assigned based on the first available sustainability rating for each fund. The sample spans from 2015 to 2016. Columns (1) and (3) use the full sample, while Columns (2) and (4) restrict the sample to funds with sustainability ratings. All specifications include fund and category × year-quarter fixed effects. Control variables include lagged fund size and lagged fund returns, each interacted with the $Post_{>2016Q1}$ indicator. Standard errors are two-way clustered at the fund and category × year-quarter levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Flow*		*High DTI Ratio*	
Sample	Full	Rated	Full	Rated
	(1)	(2)	(3)	(4)
Five Globes × $Post_{>2016Q1}$	0.0111***	0.0088**	0.0236**	0.0235**
	(0.0036)	(0.0037)	(0.0111)	(0.0112)
One Globe × $Post_{>2016Q1}$	-0.0073*	-0.0097**	0.0230**	0.0228**
	(0.0041)	(0.0042)	(0.0111)	(0.0111)
Observations	65,573	58,845	57,881	52,323
Adjusted R-squared	0.2946	0.2920	0.2544	0.2565
Controls	Y	Y	Y	Y
Fund FE	Y	Y	Y	Y
Category × Year-Quarter FE	Y	Y	Y	Y

Table A4: Dynamic Treatment Effects on Dividends by Inflow and Outflow Shocks

Table A4 reports the dynamic DiD estimates of dividend policy after the Morningstar Sustainability Rating introduction, separately for firms exposed to inflow or outflow shocks. The treatment variables are defined as follows: $Treat_{FiveGlobes}$ includes firms in the top quartile of ownership by five-globe funds as of December 2015, and $Treat_{OneGlobe}$ includes those in the top quartile of ownership by one-globe funds. Following Column (2) of Table 6, the $Post_t$ indicator is decomposed into year-specific variables – Pre_{2015}, $Post_{2016}$, $Post_{2017}$, and $Post_{2018}$ – to trace the dynamic effects of the rating introduction. All specifications include firm and country × industry × year fixed effects. Column (2) additionally includes pre-event average firm characteristics from 2013–2015, interacted with year dummies. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Dividend*	
	(1)	(2)
$Treat_{FiveGlobes} \times Pre_{2015}$	0.0009	0.0006
	(0.0007)	(0.0008)
$Treat_{FiveGlobes} \times Post_{2016}$	0.0014	0.0011
	(0.0009)	(0.0010)
$Treat_{FiveGlobes} \times Post_{2017}$	0.0029***	0.0027**
	(0.0009)	(0.0011)
$Treat_{FiveGlobes} \times Post_{2018}$	0.0018*	0.0022*
	(0.0010)	(0.0012)
$Treat_{OneGlobe} \times Pre_{2015}$	-0.0002	-0.0001
	(0.0006)	(0.0006)
$Treat_{OneGlobe} \times Post_{2016}$	0.0017**	0.0020***
	(0.0007)	(0.0008)
$Treat_{OneGlobe} \times Post_{2017}$	0.0012	0.0016**
	(0.0008)	(0.0008)
$Treat_{OneGlobe} \times Post_{2018}$	0.0007	0.0021**
	(0.0008)	(0.0008)
Observations	38,133	38,133
Adjusted R-squared	0.8162	0.8173
Pre-event Controls × Year	N	Y
Firm FE	Y	Y
Country × Industry × Year FE	Y	Y

Table A5: Dividend Increases and Initiations Following the Rating Introduction

Table A5 examines whether firms most exposed to the flow shock generated by the introduction of the Morningstar Sustainability Rating are more likely to raise or initiate dividend payments. The dependent variable, *Increase*, is an indicator equal to one if a firm raises its cash dividend relative to the prior fiscal year, and zero otherwise. *Initiation* is an indicator equal to one if a firm pays a dividend in the current fiscal year after paying none in the prior year, and zero otherwise. Columns (1) and (2) use the sample of firms paying dividends as of 2015, while Columns (3) and (4) use the sample of firms paying no dividends as of 2015. Columns (2) and (4) decompose *Post* into year-specific indicators to trace the dynamic effects of the rating introduction. All other specifications are identical to those in Table 6. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Increase*	*Increase*	*Initiation*	*Initiation*
Sample	Payers (1)	Payers (2)	Non-Payers (3)	Non-Payers (4)
$Treat \times Post$	0.0126		0.0168	
	(0.0167)		(0.0122)	
$Treat \times Pre_{2015}$		-0.0013		0.0273
		(0.0257)		(0.0183)
$Treat \times Post_{2016}$		0.0505*		0.0313
		(0.0269)		(0.0208)
$Treat \times Post_{2017}$		0.0030		0.0516**
		(0.0270)		(0.0207)
$Treat \times Post_{2018}$		-0.0225		0.0240
		(0.0267)		(0.0230)
Observations	26,413	26,413	10,232	10,232
Adjusted R-squared	0.1686	0.1688	-0.0063	-0.0063
Pre-event controls × Year	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Country × Industry × Year FE	Y	Y	Y	Y

Table A6: Impact of Passive Fund Flows on Dividends

Table A6 compares firms' dividend responses to trading pressure from active and passive mutual fund shareholders. $Trading\ Pressure^{active}$ and $Trading\ Pressure^{passive}$ measure firms' exposure to the flows of their active and passive mutual fund shareholders, respectively, and are standardized. Passive funds are defined as funds classified as index funds by Morningstar or whose names contain the words "index", "idx", or "passive". Column (1) examines the effects of active and passive trading pressure separately. Column (2) further decomposes trading pressure by the direction of fund flows into inflow and outflow components. All specifications include a set of firm-level controls, as well as firm and country × industry × year fixed effects as in Table 3. Standard errors are two-way clustered at the firm and country × industry × year levels and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable	*Dividend*	
	(1)	(2)
$Trading\ Pressure^{active}$	0.0003**	
	(0.0001)	
$Trading\ Pressure^{passive}$	0.0004***	
	(0.0002)	
$Trading\ Pressure^{active}_{inflow}$		0.0002**
		(0.0001)
$Trading\ Pressure^{active}_{outflow}$		0.0002**
		(0.0001)
$Trading\ Pressure^{passive}_{inflow}$		0.0000
		(0.0001)
$Trading\ Pressure^{passive}_{outflow}$		0.0005***
		(0.0001)
Observations	152,135	152,135
Adjusted R-squared	0.7246	0.7246
Controls	Y	Y
Firm FE	Y	Y
Country × Industry × Year FE	Y	Y