Does greater public scrutiny hurt a firm's performance?

Benjamin Bennett, René M. Stulz, and Zexi Wang[1]

August 2023

Abstract

Public scrutiny of a firm may provide valuable monitoring, but it may also have a dark side by distracting management and constraining its decisions. We use inclusion in the S&P 500 index as a positive shock to public scrutiny. Media coverage, Google searches, SEC downloads, SEC comment letters, shareholder proposals, analyst coverage, and lawsuits increase following inclusion. Post-inclusion performance falls and is negatively related to the increase in scrutiny. Included firms become better informed about their index peers and adopt investment and payout policies closer to those of their index peers the greater the increase in scrutiny they experience.

Keywords: Public attention, S&P 500 index addition, analyst coverage, investment, dividends, share repurchases

[1] Bennett is from the AB Freeman School of Business, Tulane University, Stulz is from the Fisher School of Business, The Ohio State University, NBER and ECGI, and Wang is from the Lancaster University Management School. We are grateful for comments from Harry DeAngelo, Murillo Campello, Sinan Gokkaya, Kevin Mulally, Mike Wittry, and seminar participants at Cornell, the University of Arizona, the University of Central Florida, the University of Maastricht, and the University of Reading.

1. Introduction

CEOs are often concerned about the public scrutiny that comes with leading a public firm. Founders can be reluctant to take their firm public, to quote Elon Musk, because of "the additional painful scrutiny that comes with being public."[2] Public firms at times choose to go private or go dark to avoid that scrutiny (Leuz, Triantis, and Wang, 2008). However, managers can more easily take actions adverse to shareholder interests when scrutiny is low (e.g., Kempf, Manconi, and Spalt, 2017). Because greater scrutiny can mean more monitoring of management by investors, it can increase shareholder wealth. However, not all scrutiny is by investors. Greater scrutiny can be from the media, political activists, politicians, regulators, stakeholders, and so on. As a result, greater scrutiny can have adverse effects, such as pushing managers to cater to public pressures and to refrain from controversial actions that would increase shareholder wealth (e.g., Samuels, Taylor, and Verrecchia, 2021; Edmans, Gosling, and Jenter, 2022). For instance, under greater scrutiny, managers and the company's board may avoid having a high-powered compensation plan, limit payouts, refrain from making a controversial investment, or fail to undertake an advantageous merger or divestiture because of concerns about public criticism and its potential consequences. Further, greater public scrutiny can force managers to spend more time with the media, investors, analysts, regulators, policymakers, and other segments of the public to explain and justify their actions, which could make managers less efficient and more conservative. In this paper, we investigate whether greater public scrutiny benefits firm performance. We find evidence that an increase in public scrutiny (or equivalently public attention) has an adverse effect on firm performance.

Public attention varies among public firms. Some firms consistently receive more attention because they are more prominent or salient. Management can adjust to greater attention by not taking decisions that would generate controversy even thought they would increase shareholder wealth, by spending more time externally to explain and justify its decisions, and by changing the firm's policies so that they become more like those of its peers to avoid standing out. All these actions imply that a firm with higher public scrutiny

[2] See Vance (2015).

maximizes shareholder wealth under a constraint that firms with less attention do not have. As a result, the performance of the constrained firm must be lower than the performance of the unconstrained firm, i.e., the firm with less attention, unless the benefits of greater public scrutiny, such as greater monitoring, are large enough to offset its costs.

The identification challenge in examining whether an increase in public attention affects a firm's performance and its corporate policies is that typically an increase in public attention is caused by firm developments that themselves can affect performance and corporate policies. For instance, the recent dramatic increase in scrutiny of AB Inbev led to a sharp fall in its value, but it was associated with a boycott of its biggest product, Budweiser. The researcher might then incorrectly conclude that firm value fell because of the increase in scrutiny when it might have been caused mostly by the change in demand.

Our identification approach is to use S&P 500 inclusion as a shock to the level of attention that a firm receives. We validate this shock by showing that a wide range of attention proxies increase with index inclusion. With the announcement of inclusion in the S&P 500, a firm suddenly receives much more attention and experiences an increase in passive investor holdings. Other changes to the firm, such as greater stock liquidity (Hedge and McDermott, 2003), may flow from these changes. The greater attention resulting from inclusion in the S&P 500 is a confounder that is not present with inclusions in the Russell 1000 index, so that inclusions in the Russell 1000 are more suitable as a shock to passive investment.[3] From the perspective of this study, the increase in passive investors caused by inclusion is a confounder. We show that the increase in passive investors does not explain our results.

A legitimate concern with our identification is that it could be undermined by the discretion that the S&P 500 index committee has in selecting firms for the index. The index committee could voluntarily or accidentally pick firms for the index that are about to experience an increase in scrutiny and a decrease in performance negatively correlated with the increase in scrutiny exactly at the time they are picked for the

[3] Chang, Hong and Liskovich (2014) state that "it is difficult to separate indexing from potential confounds such as news and investor recognition associated with S&P 500 membership." In this paper, greater investor recognition and news are part of the phenomenon of greater attention.

index but not before. There is no basis in the literature to support this rather convoluted alternative explanation for our findings and no evidence that the index committee could have such foresight. It is also implausible that the committee would pick poor performers for the index. The index committee could accidentally pick firms with common characteristics that predict poor performance and increased scrutiny precisely when they enter the index but these changes would not be caused by index inclusion. To the extent that the committee does not want firms to experience worse performance after joining the index, it would have to be that the committee is unaware that the characteristics it values predict poor performance. It is important to note that these characteristics would have to predict a change in performance that could not be predicted from the firm characteristics we control for. Specifically, the poor performance and greater scrutiny could not be explained by characteristics such as the firm's recent performance, its stock return volatility, its characteristics controlled for in asset pricing models, or firm characteristics captured by firm fixed effects. Further, these characteristics would have to be associated with both lower accounting performance and lower stock return performance. In addition, these characteristics would have to predict the policy changes we attribute to index inclusion.

In our empirical approach, we use a difference-in-differences (DiD) design that accounts for the selection methodology of the S&P 500 selection committee. Specifically, for firms newly added to the S&P 500 index, we choose matched firms in the same industry from a candidate pool which is constructed following the official methodology for the selection of S&P 500 index constituents.[4] We further control for firm characteristics in our regressions as well as for firm fixed effects. The matched firms, selected based on data from the year before index inclusion, serve as control firms mimicking how newly-indexed firms would evolve if not included in the S&P 500 index. We then carry out difference-in-differences analyses using the matched sample.[5]

[4] We use the index additions but not deletions in our empirical design because so many deletions are caused by acquisitions, which means we do not have the data for the deleted firms after the deletions.

[5] Specifically, we use the stacked regression estimator in our DiD analysis. Goodman-Bacon (2021) illustrates potential issues when using staggered shocks in DiD analysis. Baker, Larcker, and Wang (2022) propose the stacked regression estimator as one effective approach to deal with the potential issues. Our clean control candidates only include firms never included in S&P 500 index and the event window is four years before and four years after an index inclusion.

We show first that firms included in the index experience a large increase in public scrutiny. As far as we know, we are the first to show that inclusion in the S&P 500 has a broad-based, permanent, and substantial impact on public attention. Inclusion in the Russell 1000 index has no such effect and, consequently, inclusion in that index would not be suitable for our study. We show that media coverage, analyst coverage, Google searches, SEC downloads, SEC comment letters, lawsuits, and shareholder proposals all increase following inclusion. We find that the increase in attention does not occur for firms that are comparable to the included firms before inclusion but that are not included in the index.

After having shown that a firm added to the index experiences an increase in public attention, we investigate whether the performance of the firm changes after inclusion and whether this change in performance is caused by the change in attention. Specifically, we study the impact of increased public scrutiny on two measures of performance: return on assets (ROA) and cumulative abnormal returns (CAR). We find that these measures fall following inclusion, so that firm performance worsens following index inclusion. We show that there is a negative relation between the change in attention and the performance measures for included firms. In other words, performance decreases more for firms that experience a greater increase in attention when they join the S&P 500 index. We conduct a placebo test to support our approach by assuming that control firms are hypothetically selected into the index instead of the included firms. Using this approach, we find that hypothetical selection is not associated with a decrease in performance caused by the change in attention due to selection into the index. These results present a considerable challenge for alternative interpretations for the decrease in performance following inclusion since that decrease would have to be related to the increase in attention that results from inclusion.

Why would performance drop following an increase in attention? Greater scrutiny makes some actions that parts of the public may view unfavorably more expensive. For instance, a merger might draw attention from anti-trust authorities, payout policy may draw attention from politicians, and so on. The actions that draw unfavorable attention may lead to the imposition of new regulations, to political criticism, to lawsuits, to a loss of reputation of management, and so on. Management and boards generally avoid controversy. Recent evidence shows that boards are willing to sacrifice shareholder wealth to avoid controversy.

Specifically, Edmans, Gosling and Jenter (2022), in a survey of directors, find that "67% of directors admit that they are willing to sacrifice shareholder value to avoid controversy on CEO pay." When we decompose the change in ROA, we find that the increase in attention is followed by higher costs and lower margins. These changes are consistent with management being more reluctant to face controversy because of aggressive actions to reduce costs. Another way for a firm to reduce controversy is to adopt investment and financial policies that are better suited to the higher level of public scrutiny. Such policies are likely to be more similar to the policies of their industry peers that have a comparable level of attention, namely their industry peers in the index. Firms with very different policies are more likely to have to defend their choices if they are subject to more public scrutiny.

If optimal policies for firms change because of greater public attention as a result of being included in the index, we would expect firms to gather more information about the policies of their peers, to add board members with experience in similar levels of attention, and to incentivize management through compensation to adopt policies that are pursued by peers with similar levels of attention. We show that firms make changes that help them be better informed about the policies of their index peers. Included firms pay more attention to the SEC filings of their index industry peers after inclusion and this effect is large. Further, firms that join the index increase the number of board members with S&P 500 experience. Such board members would be more knowledgeable about the issues that arise due to the heightened public scrutiny of firms in the index. Included firms also change the benchmark peer group for managerial compensation so that it includes more S&P 500 firms. Both effects are strong. Before joining the index, a firm's board has a median of 16% of members with S&P 500 experience. After inclusion, the median is 23%. With the composition of the compensation peer group, we find that the compensation peer group of an added firm has 41.3% of firms in the S&P 500 before addition and 50.9% after addition, or a relative increase of 23.2%. Our evidence that the peer group of included firms changes and that included firms pay more attention to their index peers is new. There is no compelling argument in the literature for why firms that are included in the index would pay more attention to peers in the index than they did before being included in the index.

We would expect firms under greater scrutiny to take steps to stand out less from their index peers. We next investigate whether firms added to the index change their investment policies so that they become more like those of comparable firms in the index. We find that, in general, S&P 500 firms invest less than other firms controlling for relevant characteristics. We therefore expect added firms to decrease investment. We show that this is the case. Further, we expect the investment of included firms to comove more with their S&P 500 peers. We find strong evidence supportive of this prediction. Specifically, the investment of included firms after inclusion increases by $0.74 for every dollar of increase in investment for S&P 500 peers. Before inclusion, investment increases only by $0.29.

We also study whether firms added to the index make their payout policies more like those of firms in the index. In general, S&P 500 firms repurchase more than other firms. The difference is substantial as it corresponds to 1.9% of assets. We show that when a firm is added to the index, repurchases increase by 1.6% of assets. This effect holds controlling for firm characteristics and with both year and firm fixed effects. We further show that the repurchases of an added firm comove more with the repurchases of index industry peers after inclusion. The effect is large. Before inclusion, the included firm's repurchases increase by $0.22 for each dollar of increase in index peer firms' repurchases. After inclusion, a one-dollar increase in repurchases of index peers is accompanied by a $0.76 increase in repurchases for the included firm.

If the policy changes we document are the results of increased public scrutiny for firms added to the S&P 500 index, we expect the changes to be stronger for firms that experience greater increases in public scrutiny as a result of inclusion. To test this hypothesis, we regress the policy changes on the inclusion-driven changes in scrutiny. We find that the greater the increase in scrutiny, the greater the increase in the similarity of corporate policies. Though, to our knowledge, the literature does not have theories predicting payout and investment policies of newly included firms will comove more with those of their index peers after index inclusion, any such theory would have to explain why the extent to which policies become more similar is increasing in the change in public scrutiny resulting from inclusion in the index.

It is well-known that index inclusion leads to an increase in ownership by passive investors. We address the possibility that the decrease in performance and the increase in policy similarity we document are driven

by an increase in passive institutional ownership. We find that the decrease in performance and the increase in similarity are not related to the increase in passive ownership.

The existing literature on S&P 500 additions has often focused on the stock-price impact of addition. Superficially, it would seem that if addition to the index causes a positive abnormal return, that return is inconsistent with the effect we document. However, the price impact effect is very short-lived, so that the price impact of joining the index over a longer period is negative and consistent with our results.[6]

In this paper, we focus on public scrutiny, which is new in the literature. However, we contribute to a large and growing literature examining how media attention affects firms. This literature, at least in part, relies on the impact of adverse media attention on CEO human capital (Dyck, Volchkova, and Zingales, 2008; Liu and McConnell, 2013; Liu, McConnell, and Xu, 2017). Kuhnen and Niessen (2012) show that media attention to managerial compensation affects the components of pay, and Weisbach (2007) argues that firms may structure pay to avoid public attention. He and Tian (2013) show that analyst coverage can have an adverse impact on innovation, while Dai, Shen, and Zhang (2021) find that media attention can have both positive and negative effects on innovation. This literature provides evidence as to why a component of public scrutiny, namely the media, can cause firms to change policies.

Our paper contributes to the large literature on index additions and the impact of changes in passive ownership on firms. Two papers in the index addition literature examine greater investor awareness of a company as a potential benefit from addition to the S&P 500. Denis, McConnell, Ovtchinnikov, and Yu (2003) find that EPS forecasts improve after inclusion and argue that this improvement could result from greater investor awareness that could lead to more monitoring. EPS forecasts are affected by an increase in repurchases. We find a significant decrease in net income over assets (ROA). ROA is not affected by the number of shares. Chen, Noronha, and Singal (2004) use greater investor awareness to explain why inclusion is associated with a stock price increase but deletion is not associated with a stock price decrease. Our paper is focused on performance after inclusion rather than on the stock price impact of inclusion.

[6] See Greenwood and Sammon (2022).

The existing literature uses changes in indices as an instrument for changes in passive institutional ownership. It examines how changes in passive ownership affect firm governance and policies (e.g., Boone and White, 2015; Appel, Gormley, and Keim, 2016; and Schmidt and Fahlenbrach, 2017). Some papers focus directly on the policies we consider. In particular, Billett, Diep-Nguyen, and Garfinkel (2020) argue that S&P 500 index inclusion decreases a firm's investment-stock price sensitivity because it reduces the informativeness of stock prices, and Crane, Michenaud, and Weston (2016) show, using index inclusion, that increases in institutional ownership increase dividends and repurchases. The results we document are distinct because they cannot be explained by changes in passive ownership.

2. Sample construction

Daily and monthly stock data are from CRSP. Corporate accounting data are from Compustat. Data on media coverage are from RavenPack News Analytics. Google search volume index data for individual firms are from Google Trends. Data on financial analysts are from IBES. Data on SEC comment letters and lawsuits are from Audit Analytics. Shareholder proposal data are from Institutional Shareholder Services (ISS). Institutional ownership data are from Thomson Reuters 13F. Mutual fund holdings data are from the CRSP Mutual Fund Database and Thomson Reuters Mutual Fund Holdings (S12). The data on comparison groups in executive compensation contracts, available from 2006, are from IncentiveLab. The data on board characteristics are from BoardEx. S&P 500 index addition data are from Siblis Research. Our sample starts in 1997 and ends in 2017, covering a period of the past two decades. Our sample includes 659 S&P 500 additions. Variables are defined in the Appendix. Table 1 shows summary statistics.

3. Empirical design of the difference-in-differences analysis

To investigate the impact of an increase in public attention on a firm's corporate policies, we carry out difference in differences (DiD) analyses where treatment is the attention shock resulting from S&P 500 index addition. We first use DiD analyses to show that S&P 500 inclusion causes an increase in attention. Specifically, we identify all S&P 500 additions in our sample period. Added firms are our treated firms.

Control firms in the DiD analysis are expected to be like treated firms except that they are not treated, so that treated firms would have evolved in a similar way as control firms if they were not added to the S&P 500 index.

To identify control firms, we start by limiting our sample to firms that have the potential to be added to the S&P 500 index, which covers leading firms in leading industries of the US economy. In practice, the S&P 500 index is maintained by the US Index Committee that meets monthly and makes decisions on index constituents including index additions. The Index Committee follows published guidelines when selecting index constituents. For example, candidates for S&P 500 index constituents are usually industry leaders, and should be US firms satisfying requirements on profitability, market capitalization, stock liquidity, and trading records.[7] We use these requirements to create a pool of control candidate firms. Though the Index Committee has discretion to deviate from the guidelines, we find that such deviations are rare in our sample (less than 5% of the firms selected are firms that may deviate in some way from the guidelines other than the float guideline that we cannot check as the data is not publicly available).[8] A possible identification concern is that the Committee could use private information to select firms based on future expected performance. However, if the S&P 500 selection committee were to have private information about future performance that it would use in selecting firms into the index, it would surely select firms that are expected to perform well, which would create a bias against finding results of worse performance after selection.[9]

Specifically, based on firms covered by CRSP and Compustat, we require potential control firms to be US firms that are not S&P 500 firms. The other criteria apply only the year before the inclusion of a firm. To start with, we keep the ten largest firms (by market capitalization) in an industry as industry leaders, where we define an industry at the 2-digit SIC level. For remaining firm-years, we apply filters following

[7] Please see more details about the official methodology for the selection of S&P 500 index constituents at https://www.spglobal.com/spdji/en/documents/methodologies/methodology-sp-us-indices.pdf

[8] Li, Liu, and Wei (2021) find that only 78.26% of firms that are included from 2015 to 2018 meet the float guideline, but that is based on their own choices about how to exclude ownership stakes from the float. We cannot assess whether their conclusion is based on a different approach from S&P in computing the float or whether S&P deviates from its guidelines. The float guideline is the guideline that Li, Liu, and Wei (2021) conclude is violated the most.

[9] Note that there is no good reason to think that the index committee has private information about firms. While rating agencies have private information about firms, the index committee is separate from the rating agency.

the S&P official guidelines for S&P 500 index selection. In particular, we require a firm's market capitalization to be larger than the threshold shown by the official guidelines for that year. We only keep liquid stocks with turnover ratios above one.[10] We require firms' annual net income (excluding discontinued operations) to be positive. We require a firm to have at least a one-year stock trading record (i.e., at least one year after its IPO). These firms have the potential to be added to the S&P 500 index and be a potential control firm for our DiD analysis. We then match each included firm with two firms from the control candidate pool, which are in the industry of the included firm and have the closest market capitalization to the included firm at the end of the calendar year before the year of the index inclusion. The logic for matching on market capitalization is that the S&P Index Committee uses market capitalization as its metric for selecting industry leaders. We find that there is no significant difference in market capitalization between the treated firms and the control firms. We use an event window of four years before and four years after an index addition and the addition year is excluded.

We carry out a DiD analysis for a sample of treated and control firms using the following specification:

$$\mathrm{Y}_{it} = \beta_0 + \beta_1 \cdot \mathrm{SP500Add}_{it} + \beta_2 \cdot Pre\mathrm{SP500Add}_{it} + \mathrm{X}_{it} \cdot \Gamma + \mu_i + \nu_t + \epsilon_{it}, \quad (1)$$

where *i* is for firm *i* and *t* is for year *t*. Y is the dependent variable of interest, SP500Add is an indicator variable for S&P 500 index addition, which equals one for a treated firm after its addition year and zero otherwise, and PreSP500Add is an indicator variable for the pre-treatment trend, which equals one for a treated firm in the year before its addition and zero otherwise, X is a vector of control variables, Γ is a vector of regression coefficients on the controls, μ_i is the firm fixed effect, ν_t is the year fixed effect, and ϵ_{it} is the error term.

[10] In the S&P official guideline, the turnover is defined based on the share float. Unfortunately, the data on share float that they use is not publicly available for our sample period. We therefore calculate the annual stock turnover ratio as the annual dollar trading value divided by market capitalization, which is smaller than the turnover ratio based on share float. Nevertheless, we apply the requirement that turnover must exceed one to our measure.

The treatment effect of the DiD analysis is captured by the coefficient of SP500Add, β_1. In a DiD analysis, it is important to check the parallel trends condition. In our design, the coefficient of PreSP500Add, β_2, is for the test of the parallel trends condition. Specifically, an insignificant β_2 coefficient indicates that the treated group and the control group are not statistically different from each other before addition, which suggests the parallel trends condition is satisfied. Further evidence for the parallel trends condition is illustrated in figures showing year-by-year differences between treated and control groups (see. Figures 2, 3, and 4).

To study the impact of S&P 500 inclusion on the similarity of firm policies, we use the following specification:

$$\begin{aligned} \mathrm{Y}_{it} = {} & \beta_0 + \beta_1 \cdot \mathrm{Y}_{\mathrm{SP500Peer}_{it}} \times \mathrm{SP500Add}_{it} + \beta_2 \cdot \mathrm{Y}_{\mathrm{SP500Peer}_{it}} + \beta_3 \cdot \mathrm{SP500Add}_{it} \\ & + \beta_4 \cdot \mathrm{Y\_SP500Peer}_{it} \times \mathrm{PreSP500Add}_{it} + X_{it} \cdot \Gamma + \mu_i + \vartheta_t + \varepsilon_{it}, \end{aligned} \tag{2a}$$

where Y is the dependent variable of interest, such as investment or repurchases, and Y_SP500Peer is the corresponding average of industry peers in the S&P 500 index. X represents control variables. A positive coefficient β_1 is evidence that the relevant policy of a firm comoves more with that of its S&P 500 index peers following S&P 500 inclusion.

We also consider the comovement of included firms' policies with their non-S&P 500 peers. As a newly included firm may put more weight on policies of S&P 500 peers, it may put less weight on some policies of non-S&P 500 peers. We thus expect the firms' policies to comove less with some policies of non-S&P 500 peers, which contrasts with the greater comovement we expect with the policies of S&P 500 peers. We use the following specification:

$$\mathrm{Y}_{it} = \beta_0 + \beta_1 \cdot \mathrm{Y\_SP500Peer}_{it} \times \mathrm{SP500Add}_{it} + \beta_2 \cdot \mathrm{Y\_NonSP500Peer}_{it} \times \mathrm{SP500Add}_{it} + \beta_3 \cdot \mathrm{Y\_SP500Peer}_{it} \times \mathrm{PreSP500Add}_{it} + \beta_4 \cdot \mathrm{Y\_NonSP500Peer}_{it} \times \mathrm{PreSP500Add}_{it} + X_{it} \cdot \Gamma + \mu_i + \vartheta_t + \varepsilon_{it}, \quad (2b)$$

where Y is the dependent variable of interest, and Y_SP500Peer (Y_NonSP500Peer) is the corresponding average of industry peers (not) in the S&P 500 index. X represents the stand-alone items of the relevant interactions and other control variables. A positive (negative) coefficient β_1 (β_2) is evidence that the relevant policy of a firm comoves more (less) with that of its (non-)S&P 500 peers following index inclusion.

In the results highlighted in the text, we match included firms with firms of similar market capitalization among the set of eligible firms before inclusion. For robustness, we use an alternative approach in selecting control firms. Specifically, we use a propensity score match on market capitalization, ROA, and 2-digit SIC industry (exact match) in the year before a treated firm is added to the index, so that the matching process is not affected by index additions. This match controls for accounting performance, so that the included firm is matched with firms of similar performance before selection, which addresses the concern there could be mean reversion in performance after selection. We report the results in Internet Appendix Table IA4. We find similar results with this match.

4. S&P 500 inclusion draws greater public attention to firms: Evidence and implications

In this section, we show that inclusion in the index represents a positive shock to the level of public scrutiny a firm receives. We consider successively media attention, measures often used in the literature as proxies for investor attention, and regulatory and legal attention. These proxies for attention measure different dimensions of public scrutiny. Our list of attention proxies is not exhaustive. For instance, scholars pay more attention to firms in the S&P 500 index as well, as there are countless studies where the sample is limited to S&P 500 index constituents.

4.1. Media attention

Joining the index increases the prominence of a firm, which is expected to attract more media attention, a form of public attention. In this section, we study the effect of S&P 500 inclusion on media coverage of newly added firms.

We measure media attention by the number of news stories closely related to a firm. The news data are from RavenPack News Analytics (Dow Jones edition), which covers all news stories and press releases reported by the Dow Jones Newswires, the Wall Street Journal, Barron's, and MarketWatch. RavenPack applies machine learning techniques to analyze news concerning firms and creates a relevance score (between 0 and 100), indicating how strongly related a firm covered is to the underlying news story. A relevance score above 75 is considered significantly relevant and a relevance score above 90 indicates that the firm covered is referenced in the main title or headline of the news item.

Specifically, we define two media attention measures based on the relevance score: News_Re75 (News_Re90) is the natural logarithm of one plus the number of news stories covering a firm with a relevance score above 75 (90). To study whether inclusion in the S&P 500 increases media attention to the included firm compared with other comparable firms, we use equation (1) described in Section 3 and the dependent variable is News_Re75 or News_Re90.

Models 1 and 2 of Panel A in Table 2 report the results. Model 1 (2) shows that media attention increases by 12% (14%) after inclusion and the coefficient on SP500Add is positive and statistically significant at the 5% (1%) level.[11] There is no difference in media attention between the newly added firm and control firms in the year before inclusion.

4.2. Measures of investor attention

We use the Google search volume index (SVI) for a firm. Da, Engelberg, and Gao (2011) explain the advantages of SVI as a measure of attention and call it a "*revealed* attention measure". This index is the

[11] In our DiD analysis, the year of S&P 500 inclusion is dropped to make sure that the increase in media attention we document is not driven by news associated with the event of the firm being added to the index.

average monthly search volume index from Google Trends (on a scale from 0 to 100) within a firm-year measured from 2004 to 2020 or from the first year that it becomes available for a firm. We first show that attention to firms increases in the month of inclusion in the S&P 500 but not in the month of inclusion in the Russell 1000.

Figure 1 shows averages of the monthly search volume for firms added to the S&P 500 and to the Russell 1000 from 2004 to 2017 from month -6 before inclusion to month +6 after inclusion. The results for month zero are striking as there is no evidence of an increase in attention in month zero for Russell 1000 inclusions but there is strong evidence of such an increase for S&P 500 inclusions. The Google search index in the month of S&P 500 addition is 6.44 points higher than the average of months -2 and -1, or 18.84% higher. The sample has 265 (1,257) S&P 500 (Russell 1000) additions. This difference is significant at the 1% level. In contrast, the index in the month of Russell 1000 addition is 0.18 higher than the average of the two months before the addition or 0.52%. The difference between the increase for S&P 500 inclusions and for Russell 1000 inclusions is significant at the 1% level, as shown in the Internet Appendix Table IA1, where we also report estimates of regressions that assess the incremental attention of inclusion in the S&P 500 over inclusion in the Russell 1000. We find that the incremental effect is 9% of the standard deviation of the Google index.

We turn next to an examination of whether inclusion in the S&P 500 increases attention to the included firm compared to other firms over the same time period. To conduct that examination, we use equation (1) described in Section 3. The dependent variable is Google, which is the average monthly SVI (scaled by 100) within a firm-year. Model 1 of Panel B in Table 2 reports the result. Model 1 shows that SVI increases by 3.3% after inclusion. The coefficient on SP500Add is positive and statistically significant at the 5% level. There is no difference in SVI in the year before inclusion.

We turn next to a measure of attention that includes mostly institutional investors, the media, and corporations, namely the number of clicks and downloads of firms' SEC 10K and 10Q filings, following Loughran and McDonald (2017). The data are originally from SEC's (EDGAR) server log. Loughran and

McDonald cleaned the data and made it publicly available.[12] This data is available between 2003 and 2015. However, as discussed by Loughran and McDonald (2017), there are data issues before March 2003 and between September 23, 2005 and May 10, 2006. Therefore, we use as our sample period the years between 2007 and 2015. To assess whether S&P 500 inclusion leads to an increase in clicks and downloads of firms' SEC 10K and 10Q filings, we use equation (1) with the dependent variable Log(Views), which is the number of clicks and downloads of firms' SEC filings (in natural logarithm). Model 2 shows the result. We find that SEC filing clicks and downloads increase by 17.9% after index inclusion.

Next, we focus on analyst coverage. In an earlier study on earnings management, Yu (2008) finds a positive relation between firms in the index and analyst coverage. Here, we focus specifically on whether inclusion increases analyst coverage. Because analysts are responsive to the needs of institutional investors, we expect analyst coverage to increase when investors pay more attention to a firm. We use equation (1) with the dependent variable Log(Analysts), which is the number of analysts following a firm (in natural logarithm). Model 3 reports the results. The coefficient of SP500Add is positive and statistically significant at the 5% level. The results confirm that more analysts follow a firm after it is included into the S&P 500 index.

Finally, we examine whether inclusion changes the number of shareholder proposals. We would expect that, when shareholders pay more attention to firms, they tend to have more proposals to exert greater influence on firm policies, which is more likely to distort the original plans of managers. We thus use the number of shareholder proposals as a proxy of investor attention and study the effect of S&P 500 inclusions on the attention to newly added firms. Specifically, we use equation (1) with the dependent variable SH Proposals, which is the natural logarithm of one plus the number of shareholder proposals for a firm in a year. Model 4 shows that the coefficient of SP500Add is positive and statistically significant at the 1% level. S&P 500 inclusion increases SH Proposals by 18.9%.

[12] https://sraf.nd.edu/data/edgar-server-log/

4.3. Regulatory and legal attention

After a firm is included in the S&P 500 index, it may also attract more attention from regulators, such as the Securities and Exchange Commission (SEC). It may also be more likely to be involved in lawsuits. The greater regulatory and legal attention can both exert pressure on firms and, in turn, push them to avoid some actions that would be profitable for shareholders and behave more like their peers in the S&P 500 index. In this section, we show that firms receive more regulatory attention and are involved in more lawsuits after joining the S&P 500.

We first consider evidence of greater attention from the SEC. Holzman, Marshall, and Schmidt (2023) examine the intensity with which SEC-owned IP addresses download firm financial filings, and they find that financial filings of firms in the S&P 500 index are downloaded with greater intensity. We measure a firm's regulatory attention based on comment letters from the SEC. To monitor and enhance compliance with the applicable disclosure and accounting requirements, the SEC's Division of Corporation Finance selectively reviews corporate filings.[13] The selection criteria are not publicly disclosed. However, Section 408 of the Sarbanes-Oxley Act requires the SEC to consider certain criteria, such as paying attention to firms whose operations significantly affect any material sector of the economy.[14] Inclusion in the S&P 500 could be an indicator of whether a firm affects a sector of the economy. The filing review can result in a comment letter requesting the selected firm to provide additional information. To measure a firm's regulatory attention, we define an indicator variable, SEC Letter, which is equal to one if a firm receives an SEC letter within a year and zero otherwise. We use equation (1) with the dependent variable SEC Letter. Model 5 of Panel B in Table 2 reports the result. The coefficient of SP500Add is positive and statistically significant at the 5% level, which shows that a firm is more likely to be selected in the filing review process and receive SEC comment letters after the firm is included in the S&P 500 index. The economic impact is

[13] More details are available at https://www.sec.gov/divisions/corpfin/cffilingreview.htm.
[14] https://viewpoint.pwc.com/dt/us/en/pwc/sec_comment_letters/comment_letter_trends_DM/The_comment_letter_process.html.

also significant. In particular, an S&P 500 inclusion increases the likelihood of receiving SEC letters by 3.8%, which corresponds to 16.2% of the sample mean.

We measure a firm's legal attention by the extent to which it is involved in lawsuits. Specifically, we define Lawsuits as the natural logarithm of one plus the number of federal district lawsuits within a firm-year. We use equation (1) with the dependent variable Lawsuits. Model 6 reports the result. The coefficient of SP500Add is positive and statistically significant at the 10% level. Economically speaking, the effect corresponds to 8.4% of the sample mean of Lawsuits. This shows that a firm tends to be involved in more lawsuits and attract greater legal attention after it is included in the S&P 500 index.

5. Public attention shock and firm performance

We have shown that S&P 500 inclusion represents an attention shock. In this section, we investigate whether the attention shock has real effects on firm performance.

5.1. Inclusion and firm performance

For our investigation, we consider two measures of firm performance, which are ROA and the one-year cumulative abnormal return (CAR). ROA is defined as the ratio of net income over assets, which is an accounting performance measure not depending on the number of shares outstanding, so that it is not mechanically affected by repurchases. The one-year CAR is the long-run cumulative abnormal return of a firm within one year. To calculate the one-year CAR, we first subtract a firm's monthly stock return by that of a portfolio matched based on market capitalization, book-to-market, and the prior-year return, following Daniel, Grinblatt, Titman and Wermers (1997). We then cumulate the monthly abnormal returns within a fiscal year as the one-year long-run CAR.

Figure 2 shows how these performance measures evolve from year -4 to year +4. Specifically, ROA (Panel A) and the one-year CAR (Panel B) are regressed on yearly indicator variables relative to the year of S&P 500 inclusion, which equal one for treated firms in the corresponding year and zero otherwise, and the control variables used in Table 3. The Y-axis plots the coefficient estimates on the yearly indicator

variables. The X-axis shows the year relative to the S&P 500 inclusion year. The year before inclusion is set as the base year and the year of inclusion is dropped. The grey bars show the 95% confidence intervals of the coefficient estimates, where the confidence intervals are based on standard errors clustered at the firm level. The figure shows that the performance of treated firms is indistinguishable from that of control firms before S&P 500 inclusion and falls below the performance of control firms after inclusion.

Our regression analysis uses the model shown in equation (1). We first investigate how ROA changes with inclusion. Model 1 of Panel A in Table 3 reports the result. The coefficient of SP500Add is negative and statistically significant at the 1% level. ROA falls by 1.3 percentage points when a firm joins the S&P 500 index, which corresponds to 15.1% of its standard deviation. The result demonstrates that firm performance measured by ROA worsens following S&P 500 index inclusion.

We conduct a placebo test using control firms. For a given included firm, in the set of firms eligible to be included, we choose the industry peer firm that has the closest market value to the included firm. We then assume that this matching firm is hypothetically selected into the index instead of the firm that is included in the index. We then select control firms for the hypothetically selected firms using a propensity score matching by market capitalization and the same industry. Following this approach, we re-estimate Model 1 assuming that the treated firm is the hypothetically selected firm. Model 2 shows that hypothetically treated firms do not experience worse performance after the hypothetical treatment.

ROA can fall because a firm's revenue falls or its expenses increase. We estimate separately whether treatment causes a change in revenue to assets or in expenses to assets. Model 3 shows that the coefficient of SP500Add is positive but statistically insignificant, which means revenue does not change significantly following inclusion. In contrast, Model 4 shows that expenses increase following inclusion. This is consistent with the greater attention making management unwilling to cut costs aggressively in a way that could generate controversy. We also calculate the profit margin as the ratio of net income over revenue. In Model 5, we find that the profit margin falls for treated firms. Note that the interpretation of the coefficient is that the treatment effect is a drop of 2% of the profit margin.

We turn next to the effect of treatment on CAR. Model 6 reports the estimate. The coefficient of SP500Add is negative and statistically significant at the 5% level. In particular, the one-year CAR decreases by 3.9 percentage points when a firm joins the S&P 500 index, which corresponds to 10.5% of its standard deviation. Our estimation does not use the CAR of the year of inclusion. One might be concerned that inclusion has a positive valuation effect, so that overall inclusion could have a positive long-run effect on returns if the year of inclusion is included. This is not so. Over our sample period, the year of inclusion CAR is significantly negative at -0.36% per month.

As we discussed in the introduction, the change in passive ownership that accompanies inclusion in the index is a potential confounder. When a firm is added to the S&P 500 index, index funds rebalance their portfolios to include the firm in their holdings. We estimate the change in passive holdings of added stocks relative to that of comparable firms using our DiD model. We define a firm's passive holdings as the percent of the firm's shares held by passive mutual funds. To assess whether a fund is a passive fund, we use the active share measure proposed by Cremers and Petajisto (2009). Specifically, the active share measures the percentage of fund holdings with weights that differ from the weights in the S&P 500 index. We define a fund to be an S&P 500 passive mutual fund if it is a fund with a name that includes both "index" and "500" or a fund with an active share using the S&P 500 as a benchmark that is below 60%.[15] We report the results of our DiD analysis in Internet Appendix Table IA2. The dependent variable in equation (1) is passive holdings as defined above. Model 1 shows that the coefficient of SP500Add is positive and statistically significant at the 1% level (*t*-value 25.72). The coefficient estimate of 0.034 means that after index addition passive holdings increase by 3.4 percentage points. Model 2 shows the estimate of the regression for active mutual funds—the mutual funds that are not passive. We find that holdings by active mutual funds decrease when a stock is added to the index. Model 3 shows the effect of index additions on total holdings by all 13F institutions. The holding data is from Thomson Reuters 1. Like Patel and Welch (2017), we find that the

[15] Our results are robust to alternative cutoffs such as 40%.

coefficient on SP500Add is not statistically different from zero. It means that when looking at all institutional investors, there is no significant change in holdings for newly added firms.

To account for changes in passive ownership, we estimate regressions for ROA and CAR where we control for the change in passive ownership. We define the change in passive ownership, Ch(Passive), as the first difference in a firm's passive ownership in a year, where the passive ownership is the fraction of shares held by passive mutual funds as defined above. We show the results in Internet Appendix Table IA3. The coefficients on SP500Add are like those in Table 3. Further, the coefficients on the control variables are like those in Table 3 as well. In other words, controlling for changes in passive ownership does not change our results. This is the case even though the change in passive ownership has positive significant coefficients. In other words, greater passive ownership helps firm performance as found in the literature (e.g., Appel, Gormley, and Keim, 2016).

In sum, the results in Panel A of Table 3 reveal an adverse impact of the attention shock of S&P 500 inclusion on firm performance. Note that we use stock return volatility as a control to take into account the possibility that the index committee selects less volatile firms. To address the concern that mean reversion could explain our results, we report in Panel A of Internet Appendix Table IA4 estimates where we select control firms using their ROA before inclusion. We turn next to showing that the decrease in firm performance is directly related to the magnitude of the attention shock.

5.2. Is the change in performance related to the change in public scrutiny?

To extract the fraction of the attention change related to S&P 500 inclusion, we use principal component analysis (PCA) to construct a measure of attention based on the three attention measures used in Section 4 for which we have data for the whole sample period: Log(Analysts), SEC letters, and Lawsuits.[16] We extract

[16] For other attention measures we only have data for about half of our sample period, however. PCA only works for observations in which all related variables are non-missing. Nevertheless, we run robustness tests using six attention measures (available in a much shorter period) and the results are consistent, as shown in Internet Appendix Table IA5.

the first principal component in the PCA and denote it as Attention. We then calculate the part of Attention related to S&P 500 inclusion through the following regression estimated at the firm level:

$$\text{Attention}_{it} = \beta_0 + \beta_1 \cdot \text{SP500Add}_{it} + \varepsilon_{it}, \quad (3)$$

where Attention is as defined above, SP500Add is the indicator variable that equals one for a treated firm after its addition year and zero otherwise, and ε_{it} is the error term. Specifically, we use the fitted value, Attention_SP500$_{it}$, as the attention increase resulting from S&P 500 inclusion for firm *i* at time *t*.

To investigate the relation between the attention shock and firm performance, we use the following specification:

$$\text{Y}_{it} = \beta_0 + \beta_1 \cdot \text{Attention\_SP500}_{it} + \text{X}_{it} \cdot \Gamma + \mu_i + \nu_t + \varepsilon_{it}, \quad (4)$$

where Y is ROA, Rev/Assets, Expenses/Assets, Profit margin, or one-year CAR, Attention_SP500 is the attention increase resulting from S&P 500 inclusion as described above. Panel B of Table 3 reports the results. Model 1 shows that the treatment effect on ROA is negatively related to the increase in attention, so that firms that experience a greater increase in attention from being included in the index have a greater decrease in ROA. The coefficient of Attention_SP500 in Model 1 is negative and statistically significant at the 5% level. The economic impact is also significant. A one-standard-deviation increase in Attention_SP500 decreases ROA by 0.66 percentage point (-0.012×0.553), which is about 12.2% of the average ROA in our sample.[17] Panel B of Internet Appendix Table IA4 shows that the result of Panel B of Table 3 for ROA holds when we select control firms taking into account their ROA before inclusion.

We implement our placebo test for Model 1 as well. To do that, we estimate equation (3) for the hypothetically selected firms. We then repeat the estimation of Model 1 using as treated firms the hypothetically selected firms. Model 2 shows that, in contrast to the results for included firms, there is no relation between post-selection performance and attention for hypothetically selected firms.

[17] In the test sample the standard deviation of Attention_SP500 is 0.553.

Model 3 shows that the greater the increase in attention, the greater the increase in revenue. Though being included in the index does not increase revenue significantly, firms that have a greater increase in attention experience a statistically significant greater increase in revenue. We find next in Model 4 that the increase in expenses is greater for firms with a greater increase in attention. In Model 5, the profit margin falls more for firms that experience a greater increase in attention. Lastly, the coefficient Attention_SP500 in Model 6 is negative and statistically significant at the 10% level. A one-standard-deviation increase in Attention_SP500 reduces the one-year CAR by 2.49 percentage points, which corresponds to 37.7% of the average CAR in our sample. In sum, the findings in Panel B of Table 3 suggest that the impact of the attention shock on performance increases with the magnitude of the attention shock.

In these tests using equation (4), Attention_SP500$_{it}$ is estimated at the firm level using equation (3), so that there is a concern about errors in variables. One way to address this issue is to estimate equation (3) across panels of subsets of observations. We do that in two ways. First, we estimate the regression at the industry level (4-digit SIC). We then estimate equation (4) using Attention_SP500 for the industry. The results are similar. Further, all three coefficients on Attention_SP500 are larger in absolute value. We show the results in Models 1 and 2 of Panel A of the Internet Appendix Table IA6. A second approach to address the issue of errors-in-variables is to use an indicator variable for firms that experience a larger increase in attention. The results are shown in Columns 3 and 4 of Panel A of Table IA6. The results are like those in the table. Lastly, we estimate equation (3) using the whole sample but with firm and year fixed effects and use fitted values in equation (4). We show the results in Columns 5 and 6 of Panel A of Table IA6. In that case, the coefficient on Attention_SP500 is negative and statistically significant in each regression.

We performed additional robustness tests that are reported in Table IA6. First, in Columns (1) and (2) of Panel B of Table IA6, we show results for ROA when we control for acquisitions. We add to Column (1) of Panels A and B of Table 3 acquisitions over lagged assets. This robustness test addresses the concern that the change in performance might be due to changes in acquisition activity. There is no evidence that included firms acquire more than the non-included firms. We find that adding this variable does not change our conclusions. Next, for robustness, we replace the firm fixed effects with industry fixed effects. We

show the results in Columns (3) and (4) of Panel B of Table IA6. Again, our conclusions are unaffected. Lastly, we shorten the window for the DiD to [-3,+3]. We show the results in Columns (5) and (6) of Panel B of Table IA6. The results are slightly stronger.

The evidence in this section shows that the performance of treated firms is lower following the attention shock and the extent of the decrease in performance is increasing in the size of the attention shock. For these facts to be explained by something other than the attention shock, one would need to find a variable that is correlated with the attention shock and the size of the attention shock. This variable would then have to be negatively related to performance and would have to explain the evidence we turn to next. We are not aware of a variable that the literature has suggested that could perform this role.

6. Newly-included firms' attention to index peers, CEO incentives, and board structure

We would expect firms to react to the increase in public attention by taking steps to minimize the potentially adverse effects of increased attention. To do so, they would want to understand better how other firms cope with the level of attention that comes with belonging to the S&P 500 index and they would want management to have incentives to pay attention to the policies of these firms. In this section, we show that, after inclusion, firms search the filings of S&P 500 firms and S&P 500 industry peers more, they increase the number of S&P 500 firms in their compensation benchmark peer group, and their board exhibits an increase in the number of members with experience at S&P 500 firms.

As a firm is included in the index and experiences an increase in attention, we would expect it to pay more attention to its peers in the index for the simple reason that these firms have to deal with the same level of attention that the included firm has to deal with. Though one might argue that an included firm has reasons to pay attention to index peers regardless of the commonality in attention, it is not clear why these firms would become more relevant for the included firm simply because it is now part of the index absent the impact of the index inclusion on attention. A plausible argument is that index peers have elevated passive institutional ownership and that the included firm gains that level of passive institutional ownership

through inclusion. However, we show that the change in passive institutional ownership cannot explain our results.

We find consistent evidence of the included firm's increased attention to index peers following the approach of Bernard, Blackburne, and Thornock (2020).[18] Specifically, Bernard, Blackburne, and Thornock (2020) use the logs of SEC's EDGAR repository and construct a novel measure for firms' search activities on SEC filings that identifies a pair of firms including both the searching firm and the target firm that is searched, where the searching firm is identified by its IP address. This measure makes it possible to identify which firms are the search targets of firms newly included in the S&P 500 index. Accordingly, we calculate a firm's views of SEC filings of S&P 500 firms and views of SEC filings of its S&P 500 peers using this measure.

The relevant results are reported in Table 4. Model 1 uses equation (1) and the dependent variable is a firm's views of S&P 500 firms, which is the sum of a firm's clicks and downloads of SEC filings of all S&P 500 firms (excluding the firm itself, in natural logarithm) in a year. We see that a firm increases its views of other S&P 500 firms after S&P 500 inclusion. When we narrow the set of target firms to S&P 500 peers where a peer is a firm with the same one-digit SIC code, we see that included firms also increase their views of S&P 500 peers, as reported in Model 2.

Next, we examine whether index inclusion affects how management is evaluated. To the extent that the firm rationally pays more attention to index peers because they face a similar environment to the one faced by the included firm in terms of attention, we would expect the board to want to incentivize management to pay attention to index peers. As a result, we expect a change in how management is compensated. Boards usually specify a list of peer firms in executive compensation contracts and use these peers as the benchmark of executive performance in the relative performance evaluation (Aggarwal and Samwick, 1999; Gong, Li, and Shin, 2011). This relative performance determines the performance-based portion of the CEO's compensation. If a board includes more S&P 500 firms in a CEO's peer group following the addition of the

[18] We thank Bernard, Blackburne, and Thornock (2020) for sharing the data. We use the pairwise downloads based on the predicted IP addresses.

firm to the index, we would expect that this leads the CEO to take actions more like those of the firm's peers in the index.

We collect the data on peer firms from IncentiveLab and define a variable %SP500Peer as the portion of S&P 500 peer firms in a firm's peer group for the relative performance evaluation. This data is available since 2006. We first show univariate results that compare the average of %SP500Peer in newly added firms before and after S&P 500 additions. These results are reported in Panel A of Table 5. The results show that before index addition, the average portion of S&P 500 peers is 41.3% and the average is 50.9% after index addition, which is 9.6 percentage points higher or 23.2% higher. The difference in the averages is statistically significant at better than the 1% probability level.

We further carry out a DiD analysis and use %SP500Peer as the dependent variable. Results are reported in Panel B. The coefficient of SP500Add in Model 1 is positive and statistically significant at the 1% level. The coefficient of 0.068 means that a newly added firm increases the portion of S&P 500 peers in the relative performance evaluation peer group by 6.8 percentage points, which is 16.5% of the average proportion before the index addition. Note that the coefficient on PreSP500Add is small and insignificant, which indicates that there is no difference in the fraction of S&P 500 peers in the performance evaluation peer group of the treated firms and of the control firms before index addition. The evidence is consistent with the hypothesis that corporate boards incentivize managers to pay more attention to S&P 500 peers after inclusion. One might argue that the board does not necessarily know about the index inclusion when it selects the peer group in the event year. Therefore, we also estimate the regression lagging the control variables. Model 2 shows that the results are similar.

We also look at how the composition of the board changes after inclusion. As firms joining the index experience greater attention, we would expect the board to attempt to find members that have experience with the type of attention S&P 500 firms receive. We use equation (1) for the analysis. The dependent variable is the fraction of board members with S&P 500 experience (in other S&P 500 firms). Table 6 shows that a firm has more board members with S&P 500 experience after inclusion. We see that the fraction of board members with S&P experience increases significantly after inclusion. In economic terms,

Model 2 shows that the fraction of board members with S&P 500 experience increases by 12.4% of its sample mean after inclusion.

It is important to note, however, that the increase in the fraction of board members with S&P 500 experience could be due to an increase in the supply of such members. It is plausible that board members with S&P 500 experience might prefer being members of boards of firms that belong in the index. In this case, as a firm joins the index, it would be in a better position to recruit board members with S&P 500 experience.

7. How does an increase in attention affect firm corporate policies?

In this section, we investigate a specific testable channel through which an increase in attention can have real effects on firms. This channel is that greater attention leads firms to choose policies that are more like those of peers with similar levels of attention. Firms are likely to want to do that for at least two separate reasons. First, firms in the index have found ways to cope with increased attention and their policies reflect that. Hence, choosing such policies amounts to choosing policies that are likely optimal given the level of attention of these firms. Second, these firms are less likely to stand out if they adopt policies like those of their peers that have similar levels of attention.

Our approach has two steps. In the first step, we show that index inclusion results in firms changing their corporate policies so that they become more like those of their index peers. In the second step, we show a direct connection between policy similarity and the change in attention resulting from S&P 500 inclusion, as we find that the comovement of policies with index peers is greater for firms that experience a greater increase in attention.

We expect a level effect and a comovement effect for corporate policies from index inclusion. Consider investment. We expect an included firm to decrease investment if S&P 500 firms invest less (the level effect) and we expect an included firm's investment to comove more with the investment of its index peers (the comovement effect). We examine these two effects for investment and payouts. Further, as an included

firm pays more attention to the policies of index peers, it follows that it should pay less attention to the policies of its non-index peers. We show evidence supportive of this prediction.

We interpret our results to show that policies of included firms move towards the policies of peers in the S&P 500. A concern is that instead firms in the index could change their policies to become more similar to those of the included firm. If they were to do so, the policies of index peer firms would become more similar. We investigate this possibility by examining as a placebo test whether the policies of the index peer of the included firm with the closest market capitalization comove more with the policies of the other index peers after the inclusion of the new firm. We find that this is not the case and report the results in Table IA7 of the Internet Appendix.

7.1. Investment

We first examine whether the investment rate of S&P 500 firms differs from that of other firms. We measure investment by the growth of total assets, which is the annual change in total assets scaled by lagged total assets. We call this measure investment. This measure has now become a standard measure of investment in the asset pricing literature (see, for instance, Fama and French, 2015). We regress investment on an indicator variable for inclusion in the S&P 500 index and control variables. Industry fixed effects are included so that we capture the within-industry cross-sectional heterogeneity in investment between S&P 500 firms and non-S&P 500 firms.[19] Year fixed effects are also included. The test sample includes all S&P 500 firms and the largest 500 non-S&P 500 firms (by market capitalization) each year. The results are reported in Panel A of Table 7. The coefficient on the S&P 500 membership indicator variable SP500 is negative and statistically significant at the 1% level in both models. The evidence shows that firms in the S&P 500 index tend to have a lower investment rate than their industry peers not in the index.

We then investigate the treatment effect on investment of joining the index. We use equation (1) with investment as the dependent variable. Firm fixed effects and year fixed effects are included. The test sample

[19] The purpose of these tests is to capture the cross-sectional variation in investment between S&P 500 firms and non-S&P 500 firms rather than the within-firm variation. We thus include industry fixed effects rather than firm fixed effects.

includes treated firms that join the S&P 500 index and control firms of the DiD analysis. The results are reported in Panel B of Table 7. The coefficient on the treatment indicator variable SP500Add is negative and statistically significant at the 1% level in Models 1 and 2. The results show that newly added firms significantly decrease their investment following index addition.

Instead of using the change in assets as a measure of investment, we also use the total of capital expenditures (net of divestiture), R&D, and acquisitions. In general, R&D expenses are not capitalized, but they constitute an important form of investment for firms. We show in Model 3 that there is a negative treatment effect on this measure of investment. We then look at each component of this measure of investment. We find that all three components have a negative treatment effect, but the treatment effect is significant only for acquisitions. Note that firms with greater public attention, including greater attention from possibly anti-trust authorities, might be especially leery of making large acquisitions that could become controversial.

Figure 3 shows how investment measured as the change in total assets evolves from year -4 to year +4. Specifically, investment is regressed on yearly indicator variables for each year relative to the year of S&P 500 inclusion, which equal one for treated firms in the corresponding year and zero otherwise, and the control variables (as in Model 2 of Panel B in Table 7). The Y-axis plots the coefficient estimates on the yearly indicator variables. The X-axis shows the year relative to the S&P 500 inclusion year. The year before inclusion is set as the base year and the year of inclusion is dropped. The grey bars show the 95% confidence intervals of the coefficient estimates, where the confidence intervals are based on standard errors clustered at the firm level. The figure shows that the investment of treated firms is indistinguishable from that of control firms before S&P 500 inclusion (parallel trends) and falls below the investment of control firms after inclusion.

To study the treatment effect on the association between the added firm's investment and its industry peers in (out of) the index, we define a variable Y_SP500Peer (Y_NonSP500) as the average investment of (non-) S&P 500 peers in a firm's industry (4-digit SIC, excluding the firm itself). Panel C of Table 7 shows results on investment comovement. Model 1 uses equation (2a) of Section 3. Model 1 shows that the

coefficient on the interaction Y_SP500Peer x SP500Add is positive and statistically significant at the 1% level. This result means that the investment comovement significantly increases following index inclusion. Model 2 uses equation (2b), which further considers the investment comovement with non-S&P 500 peers. The result shows that the coefficient on the interaction Y_SP500Peer x SP500Add remains positive and statistically significant at the 1% level. The coefficient on the interaction Y_NonSP500Peer x SP500Add is negative but not statistically significant. This result shows that after S&P 500 inclusion, a firm's investment comoves more with that of S&P 500 peers. In contrast, the firm does not comove more with non-S&P 500 peers. Internet Appendix Table IA8 shows that the results of Table 7 (Panels B and C) hold when we select control firms taking into account their ROA before inclusion.

7.2. Payout policy

We first examine whether the payouts of S&P 500 firms differ from the payouts of other firms. We consider separately dividends, repurchases, and total payouts. We regress dividends, repurchases, and payouts on an indicator variable for whether a firm belongs to the S&P 500 index, industry and year fixed effects, and control variables. The test sample includes all S&P 500 firms and the largest 500 non-S&P 500 firms (by market capitalization) in each year. The results are reported in Panel A of Table 8. Model 1 shows that S&P 500 firms pay significantly fewer dividends than other firms do. In contrast, Model 2 shows that, within an industry, S&P 500 firms repurchase more than other firms after controlling for total assets, Tobin's q, cash flow, cash, leverage, stock return, return volatility, stock liquidity, and firm age, by about two percentage points of assets. Model 3 shows that the result for total payouts is similar to the result for repurchases.

We then investigate the treatment effect on payout policy of joining the index. Firm fixed effects and year fixed effects are included. The test sample includes treated firms newly added to the S&P 500 index and control firms for the DiD analysis. Panel B of Table 8 reports the results. Model 1 documents that dividends significantly increase following index addition, but the size of increase is much smaller than that in repurchases shown in Model 2. This increase is surprising given our results that S&P 500 firms pay less

dividends than other firms. Model 2 shows that index addition increases repurchases by 1.6% of assets, which is 47.1% of the sample mean for repurchases of 3.4%. Model 3 shows a similar result for total payouts.

Figure 4 shows how dividends, repurchases, and payouts of the treated group evolve from year -4 to year +4 relative to the control group. We find no significant difference in years before inclusion. After inclusion, the difference is significant every year for total payouts and repurchases. For dividends, the difference is significant in year +4 only.

To study the treatment effect on the comovement between the added firm's payout policies and its industry peers in (out of) the index, we define Y_SP500Peer (Y_NonSP500Peer) for dividends, repurchases, and payouts, which are the average dividends, repurchases, and total payouts of (non-)S&P 500 peers in a firm's industry (4-digit SIC, excluding the firm itself), respectively. Equations (2a) and (2b) are used for the relevant tests. The focus is on the coefficient of the interactions Y_SP500Peer x SP500Add and Y_NonSP500Peer x SP500Add.

Results on payouts comovement are reported in Panel C of Table 8. Models 1, 3, and 5 use equation (2a) and focus on the comovement with S&P 500 peers. Model 1 shows the result for dividends. In practice, firms usually smooth dividend payments, so comovement may not be important for dividends. Nevertheless, Model 1 shows that the coefficient on Y_SP500Peer x SP500Add is positive and statistically significant at the 5% level, which means that after index inclusion, dividend payouts of newly included firms comove more with those of their industry peers in the S&P 500 index. Similarly, Model 3 shows that index inclusion increases repurchase comovement between newly included firms and their industry peers in the S&P 500. Not surprisingly, the effect on comovement is stronger for repurchases than for dividends. In particular, the magnitude of the coefficient on Y_SP500Peer x SP500Add in Model 3 for repurchases is more than twice that in Model 1 for dividends. Model 5 shows that the treatment effect on the comovement of total payouts is consistent with that of its two components as shown in Models 1 and 3.

Models 2, 4, and 6 further consider the comovement with non-S&P 500 peers using equation (2b). All coefficients on Y_SP500Peer x SP500Add in Models 2, 4, and 6 are positive and statistically significant at

the 1% or 5% level, which means that following S&P 500 inclusion a firm's payout policy comoves more with that of S&P 500 peers. These findings are consistent with those in models using equation (2a). Regarding the coefficients on Y_NonSP500Peer x SP500Add, Models 2 and 6 show that, following S&P 500 inclusion, a firm's dividends and total payouts comove significantly less with those of non-S&P 500 peers, but there is no significant change in the comovement of repurchases of included firms with the repurchases of their non-S&P 500 peers, as shown by Model 4. Internet Appendix Table IA8 shows that the results of Table 8 (Panels B and C) hold when we select control firms taking into account their ROA before inclusion.

To address the concern that our results depend on how we define the index industry peers, we repeat the analysis using industry peers from the text-based network industry classifications (TNIC) from the Hoberg and Phillips data library to define industry peers.[20] The results are reported in Internet Appendix Table IA9. Panel A shows that following the S&P 500 inclusion, a firm comoves more with its S&P 500 peers (TNIC) in investment and payout policies. Panel B further considers comovement with non-S&P 500 peers and the results show that following S&P 500 inclusion the comovement with S&P 500 peers all remains positive and significant, and the comovement with non-S&P 500 peers in investment (payout policies) decreases (does not change) significantly.

7.3. Increase in attention and increase in similarity of corporate policies

One could argue that firms invest less and payout more after inclusion because they become more conservative. This argument begs the question of why firms become more conservative after joining the index. We argue that included firms change policies because of greater scrutiny. In this section we show that the increase in corporate policy similarity between included firms and index peers is positively related to the size of the attention shock.

To investigate the attention effect on similarity of firm policies, we use the following specification:

[20] https://hobergphillips.tuck.dartmouth.edu/

$$\mathrm{Y}_{it} = \beta_0 + \beta_1 \cdot \mathrm{Y}_{\mathrm{SP500Peer}_{it}} \times \mathrm{Attention}_{\mathrm{SP500}_{it}} + \beta_2 \cdot \mathrm{Y}_{\mathrm{SP500Peer}_{it}} + \beta_3 \cdot \mathrm{Attention}_{\mathrm{SP500}_{it}} + \mathrm{X}_{it} \cdot \Gamma + \mu_i + \nu_t + \varepsilon_{it}, \quad (5)$$

where Y stands for a firm policy, such as investment or payout, Y_SP500Peer is the average Y of S&P 500 peers in a firm's industry (4-digit SIC, excluding the firm itself). Attention_SP500 is the fitted value using equation (3) in Section 5.2. The coefficient of the interaction, β_1, captures the amplification effect of the attention increase from S&P 500 inclusion on the similarity of firm policies. Table 9 reports the results.

The results show that the coefficients on the interaction items are positive and statistically significant for investment and dividends at the 10% level and at the 1% level for repurchases and payouts. It follows that for investment, dividends, repurchases, and total payouts, the increase in attention from S&P 500 inclusion significantly amplifies the increase in similarity of firm corporate policies. The economic impacts are also significant. For example, in Model 1 for investment, a one-standard-deviation increase in Attention_SP500 leads to an increase in corporate policy similarity of 0.122, which is 55% of the increase in similarity for a benchmark firm.[21] Internet Appendix Table IA10 shows that the result of Table 9 for the similarity in policies holds when we select control firms taking into account their ROA before inclusion.

8. Do changes in institutional ownership explain the increase in corporate policy similarity?

We have shown that S&P 500 inclusion causes an increase in public attention to a firm, that performance is negatively related to the attention shock, and that one channel for this effect of the increase in attention is that the included firm changes its investment and payout policies so that they resemble more those of its index peers. As is well-known and confirmed earlier, index inclusion causes an increase in passive investment. For our analysis, the increase in passive investment is a confounder. We showed earlier that our results on performance hold when we control for the change in passive ownership. We now investigate whether our results concerning the increase in corporate policy similarity could be due to the increase in passive investment instead of the increase in attention.

[21] The corresponding economic impacts for Models 2 to 4 are 30%, 48%, and 57%, respectively.

The literature has emphasized that increases in passive institutional ownership cause increases in common ownership of stocks in an index. It is plausible that passive institutional investors might push similar firms in which they have an ownership stake to have similar corporate policies. For instance, the CEO of BlackRock has an influential annual letter to CEOs where he comments on firm practices. BlackRock is typically among the largest passive investors in S&P 500 firms. He has commented on corporate policies in these letters. As an example, in 2017, it was stated that "While we certainly support returning excess capital to shareholders, we believe companies must balance those practices with investment in future growth."[22] Therefore, we investigate whether the change in passive institutional ownership explains the change in corporate policy similarity.

To investigate whether there is a relation between the change in passive institutional ownership, corporate performance, and the increase in the similarity of corporate policies, we estimate regressions in Table 10 like those in Table 9, except that now we add the change in passive ownership and the interaction of the change in passive ownership with the corporate policies of index peers, where the change in passive ownership is defined as the first difference in a firm's passive ownership in a year. The first important result of Table 10 is that the decline in performance following inclusion still increases in the increase in attention when we allow for a relation between performance and passive institutional ownership. The second result of Table 10 is that the interaction between the change in attention and the change in corporate policy similarity is robust to the addition of the change in the passive ownership variable. Specifically, the effects on investment, repurchases, and payouts remain significantly positive. The coefficient is positive as expected but not statistically significant for dividends, which is perhaps not surprising given the stickiness of dividends. The third result of that panel is that the coefficients of the interaction Ch(Passive) x Y_SP500Peer are not significant, which means that the increase in corporate policy similarity is unrelated to the increase in passive ownership. As shown in the Internet Appendix Table IA11, these results hold if we use our alternative approaches to estimate the impact of index inclusion on attention.

[22] See "Larry Fink's 2017 Letter to CEOs," https://www.blackrock.com/corporate/investor-relations/2017-larry-fink-ceo-letter.

9. Conclusion

In this paper, we investigate whether an increase in public attention to a firm affects its performance. The potential benefit of increased public attention is that it could lead to more monitoring of management, which may prevent the firm from taking actions adverse to shareholders and could punish management for taking such actions. However, increased attention also potentially has a dark side. As a result of greater public attention, management and the board may face constraints in taking actions that maximize shareholder wealth. For instance, the firm may be unable to implement a compensation plan with sufficiently high-powered incentives, have sufficiently high payouts, or undertake a major acquisition. Management may be questioned if it chooses a path that differs from its peers, which may lead it to avoid such a path even if it would be optimal for shareholders. Public attention may distract management as it must address concerns expressed by various segments of the public.

The difficulty with investigating whether an increase in public attention has net positive effects for the performance of a firm is that firms may receive more attention when their fundamentals change. As a result, the increase in attention could proxy for the impact of changes in fundamentals on performance. To resolve this issue, we use inclusion in the S&P 500 index as a public attention shock. Our identifying assumption is that the S&P 500 index committee does not select firms voluntarily or by accident because these firms will have higher attention and lower performance in the future for reasons other than their inclusion in the index.

When a firm is added to the S&P 500 index, it attracts more attention from, among others, market participants, the media, regulators, and other firms. We document that after inclusion media attention, SEC clicks and downloads, Google searches, analyst coverage, SEC letters, shareholder proposals, and lawsuits all increase. We then show that the performance of included firms decreases after inclusion and that the extent of the decrease in performance is higher for firms that receive a greater increase in attention from stakeholders. This result holds for ROA and stock returns.

As discussed, there are multiple reasons why an increase in public attention can have real effects that lead to lower corporate performance. We investigate one channel through which an increase in attention has real effects, namely the corporate policy channel. If attention is costly, firms will attempt to reduce its costs. One way to do that is to stand out less and to adopt policies that peers find valuable under similar circumstances. We show that firms adopt policies that are more like those of their index peers. We tie this result back to the increase in attention by showing that the increase in comovement of the investment and payout policies of included firms with those of index peers is an increasing function of the increase in attention for the included firms. We show that this result cannot be explained by the change in shareholder composition that results from index inclusion.

We are the first to document the increase in attention following inclusion in the S&P 500 index and to show the adverse effects of this increase in attention. An alternative interpretation of our results would require the existence of a variable that is highly correlated with the increase in attention that follows index inclusion, that predicts a decrease in performance that is positively correlated with that variable, and predicts an increase in similarity in investment and payout policies after index inclusion between included firms and index peers that is increasing in the level of that variable. Though one cannot exclude the existence of such a variable, we are not aware of a plausible candidate. There is no such candidate in the existing literature.

Our evidence shows that greater public attention for a firm has a dark side. On net, the constraints and distractions from public attention more than offset the potential benefits of greater monitoring. This result shows a new determinant of firm policies and performance for listed firms. It also contributes to the literature exploring why some firms prefer to be private rather than public. Further research should explore additional channels through which an increase in attention affects firm policies and performance.

References

Abramova, Inna, John E. Core, and Andrew Sutherland, 2020. "Institutional investor attention and firm disclosure." *Accounting Review* 95.6, 1-21.

Aggarwal, Rajesh K., and Andrew A. Samwick, 1999. "Executive compensation, strategic competition, and relative performance evaluation: theory and evidence." *Journal of Finance* 54, 1999-2043.

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

Baker, Andrew, David F. Larcker, and Charles C. Y. Wang, 2022. "How much should we trust staggered difference-in-differences estimates?" *Journal of Financial Economics* 144, no.2, 370-395.

Bandiera, Oriana, Luigi Guiso, Andrea Prat, and Raffaella Sadun, 2011. "What do CEOs Do?" Harvard Business School Working Paper.

Bernard, Darren, Terrence Blackburne, and Jacob Thornock, 2020. "Information flows among rivals and corporate investment." *Journal of Financial Economics* 136, 760-779.

Billett, Matthew T., Ha Diep-Nguyen, and Jon A. Garfinkel. 2020. "Index investing and corporate investment-price sensitivity." Unpublished Working Paper.

Bonsall IV, Samuel B., Jeremiah Green, and Karl A. Muller III, 2020. "Market uncertainty and the importance of media coverage at earnings announcements." *Journal of Accounting and Economics* 69, no. 1, 101264.

Boone, Audra L., and Joshua T. White, 2015. "The effect of institutional ownership on firm transparency and information production." *Journal of Financial Economics* 117, no. 3, 508-533.

Cao, Charles, Matthew Gustafson, and Raisa Velthuis, 2019. "Index membership and small firm financing." *Management Science* 65, no. 9, 4156-4178.

Chen, Honghui, Gregory Noronha, and Vijay Singal, 2004. "The price response to S&P 500 index additions and deletions: Evidence of asymmetry and a new explanation." *Journal of Finance 59*, 1901-1930.

Chun, Hyunbae, Jung-Wook Kim, and Randall Morck. 2011. "Varying heterogeneity among US firms: facts and implications." *Review of Economics and Statistics* 93, 1034-1052.

Chun, Hyunbae, Jung-Wook Kim, and Randall Morck. 2016. "Productivity growth and stock returns: firm- and aggregate-level analyses." *Applied Economics* 48, 3644-3664.

Crane, Alan D., Sébastien Michenaud, and James P. Weston, 2016. "The effect of institutional ownership on payout policy: Evidence from index thresholds." *Review of Financial Studies* 29, 1377-1408.

Cremers, KJ Martijn, and Antti Petajisto. 2009. "How active is your fund manager? A new measure that predicts performance." *Review of Financial Studies* 22, no. 9: 3329-3365.

Da, Zhi, Joseph Engelberg, and Pengjie Gao, 2011. "In search of attention." *Journal of Finance 66*, 1461-1499.

Dai, Lili, Rui Shen, and Bohui Zhang, 2021. “Does the media spotlight burn or spur innovation?” *Review of Accounting Studies* 26, 343-390.

Daniel, Kent, Mark Grinblatt, Sheridan Titman, and Russ Wermers, 1997. “Measuring mutual fund performance with characteristic-based benchmarks.” *Journal of Finance* 52 1035-1058.

DeHaan, Ed, Terry Shevlin, and Jacob Thornock, 2015. “Market (in) attention and the strategic scheduling and timing of earnings announcements.” *Journal of Accounting and Economics* 60, 36-55.

Denis, Diane K., John J. McConnell, Alexei V. Ovtchinnikov, and Yun Yu, 2003. “S&P 500 index additions and earnings expectations.” *Journal of Finance* 58, 1821-1840.

Dyck, Alexander, Natalya Volchkova, and Luigi Zingales. 2008. “The corporate governance role of the media: Evidence from Russia.” *Journal of Finance* 63, 1093-1135.

Edmans, Alex, Tom Gosling, and Dirk Jenter, 2022. “CEO compensation: Evidence from the field.” Unpublished working paper.

Fama, Eugene F., and Kenneth R. French, 2015. “A five-factor asset pricing model.” *Journal of Financial Economics* 116, 1-22.

Frederickson, James R., and Leon Zolotoy, 2016. “Competing earnings announcements: Which announcement do investors process first?” *Accounting Review* 91, 441-462.

Gong, Guojin, Laura Yue Li, and Jae Yong Shin. 2011. “Relative performance evaluation and related peer groups in executive compensation contracts.” *Accounting Review* 86, 1007-1043.

Goodman-Bacon, A., 2021. “Difference-in-differences with variation in treatment timing.” *Journal of Econometrics* 225, 254-277.

Greenwood, Robin, and Marco Sammon, 2022. “The disappearing index effect.” NBER working paper.

He, Jie Jack, and Xuan Tian, 2013. “The dark side of analyst coverage: The case of innovation.” *Journal of Financial Economics* 109, 856-878.

Holzman, E., Nathan T. Marshall, and B. Schmidt, 2023. “Who's on the hot seat for an SEC investigation and how do they respond.” *Journal of Accounting and Economics*, forthcoming.

Kempf, Elisabeth, Alberto Manconi, and Oliver Spalt, 2017. “Distracted shareholders and corporate actions.” *Review of Financial Studies* 30, 1660-1695.

Kuhnen, Camelia M., and Alexandra Niessen, 2012. “Public opinion and executive compensation.” *Management Science* 58, 1249-1272.

Leuz, Christian, Alexander Triantis, and Tracy Yue Wang, 2008. "Why do firms go dark? Causes and economic consequences of voluntary SEC deregistrations." *Journal of Accounting and Economics* 45, 181-208.

Li, Kun, Xin (Kelly) Liu, and Shang-Jin Wei, 2021. “Is stock index membership for sale?” NBER Working Paper.

Liang, Claire Y.C., Yaxuan Qi, Rengong Zhang, and Haoran Zhu, 2022. “Does sunlight kill germs? Stock market listing and workplace safety.” *Journal of Financial and Quantitative Analysis*, forthcoming.

Liu, Claire, Angie Low, Ronald W. Masulis, and Le Zhang, 2020. “Monitoring the monitor: Distracted institutional investors and board governance.” *Review of Financial Studies* 33, 4489–4531.

Liu, Baixiao, and John J. McConnell, 2013. “The role of the media in corporate governance: Do the media influence managers' capital allocation decisions?” *Journal of Financial Economics* 110, 1-17.

Liu, Baixiao, John J. McConnell, and Wei Xu, 2017. “The power of the pen reconsidered: The media, CEO human capital, and corporate governance.” *Journal of Banking & Finance* 76, 175-188.

Loughran, Tim, and Bill McDonald, 2017. “The use of EDGAR filings by investors.” *Journal of Behavioral Finance* 18, no. 2: 231-248.

Patel, Nimesh, and Ivo Welch, 2017. “Extended stock returns in response to S&P 500 index changes.” *Review of Asset Pricing Studies* 7, 172-208.

Samuels, Delphine, Daniel J. Taylor, and Robert E. Verrecchia, 2021. "The economics of misreporting and the role of public scrutiny." *Journal of Accounting and Economics* 71, 101340.

Schmidt, Cornelius, and Rüdiger Fahlenbrach, 2017. “Do exogenous changes in passive institutional ownership affect corporate governance and firm value?” *Journal of Financial Economics* 124, 285-306.

Vance, Ashlee. 2015. *Elon Musk: Tesla, SpaceX, and the quest for a fantastic future*. Ecco.

Weisbach, Michael S., 2007. “Optimal executive compensation versus managerial power: A review of Lucian Bebchuk and Jesse Fried's pay without performance: The unfulfilled promise of executive compensation.” *Journal of Economic Literature* 45, 419-428.

Yu, Fang Frank, 2008. “Analyst coverage and earnings management.” *Journal of financial economics* 88, 245-271.

Appendix: Variable Definitions

Acq	acquisition expenses scaled by lagged total assets, where data on acquisition expenses is from Compustat.
Amihud	Amihud (2002) illiquidity
Attention	the first component of the PCA based on Log(Analysts), SEC letter, and Lawsuits
Attention_SP500	the fitted value using equation (3) in Section 5.2, estimated firm by firm
CAR	the cumulative abnormal return within a fiscal year, where the abnormal returns are the differences between monthly stock returns of a firm and the matched portfolio based on market capitalization, book-to-market, and prior-year return, following Daniel, Grinblatt, Titman and Wermers (1997)
Capex	capital expenditures (less divestitures) scaled by lagged total assets
Cash	cash and cash equivalents scaled by total assets
Cashflow	income before extraordinary items plus depreciation and amortization all scaled by total assets
Ch(Passive)	the first difference in a firm's passive ownership (Passive), where Passive is the fraction of equity held by passive mutual funds in a year
Dividend	the dollar amount of dividends paid to common stock scaled by total assets
Expenses/Assets	revenues minus net income, scaled by total assets
Firm Age	the number of years since a firm appeared in the Compustat database
Google	the Google search volume index, which is the average monthly volume index from Google Trends (scaled by 100) within a firm-year
Investment	the annual change in total assets scaled by lagged total assets
Lawsuits	the natural logarithm of one plus the number of federal district lawsuits within a firm-year.
Leverage	the sum of short-term and long-term debt scaled by total book assets

Log(Analysts)	natural logarithm of the number of financial analysts covering a firm
Log(Assets) (Sq)	the natural logarithm of total book assets (squared)
Log(Analysts)	the natural logarithm of the number of financial analysts covering a firm
Log(Views)	the natural logarithm the number of clicks and downloads of firms' SEC 10K and 10Q filings
News_Re75 (News_Re90)	the natural logarithm of one plus the number of news covering a firm with relevance score above 75 (90) (from Ravenpack).
PreSP500Add	an indicator variable equal to one for treated firms one year prior to an addition year and zero otherwise (always equal to zero for control firms)
Profit Margin	the natural logarithm of one plus net income scaled by revenue
R&D	research and development (R&D) expense scaled by lagged total assets
Rev/Assets	revenues scaled by total assets
Repurchase	the dollar amount of repurchases scaled by total assets
ROA	net income scaled by total assets
%SP500 Directors	the fraction of directors with board experiences in other S&P500 firms in or before the addition years.
%S&P500Peer	percent of a firm's compensation peer group comprised of firms in the S&P 500
SEC letter	an indicator variable equal to one if a firm receives an SEC letter within a firm-year and zero otherwise.
SH Proposals	natural logarithm of one plus the number of shareholder proposals for a firm in a year
SP500	an indicator variable equal to one if a firm is a member of the S&P 500 and zero otherwise
SP500Add	an indicator variable equal to one for treated firms after the addition year and zero otherwise (always equal to zero for control firms)
Tobin's *q*	the sum of total assets plus market value of equity minus book value of equity divided by total assets

Volatility	the standard deviation of stock returns in a year, calculated using daily stock returns from CRSP
Y_SP500Peer	the average Y of S&P 500 peers in a firm's industry (4-digit SIC), where Y corresponds to the dependent variable in the regression.
Y_NonSP500Peer	the average Y of non-S&P 500 peers in a firm's industry (4-digit SIC), where Y corresponds to the dependent variable in the regression.

Figure 1: Google search index around index additions: S&P 500 vs. Russell 1000

This figure shows the Google search index around additions to the S&P 500 index (orange solid line) and to the Russell 1000 index (blue dashed line) from 2004 to 2017. The X-axis shows the months relative to months of index additions, which is denoted as month 0 (red vertical dashed line). Y-axis shows the average Google search index of firms added to the relevant indices. The sample includes 265 (1,257) S&P 500 (Russell 1000) additions with Google search index data available.

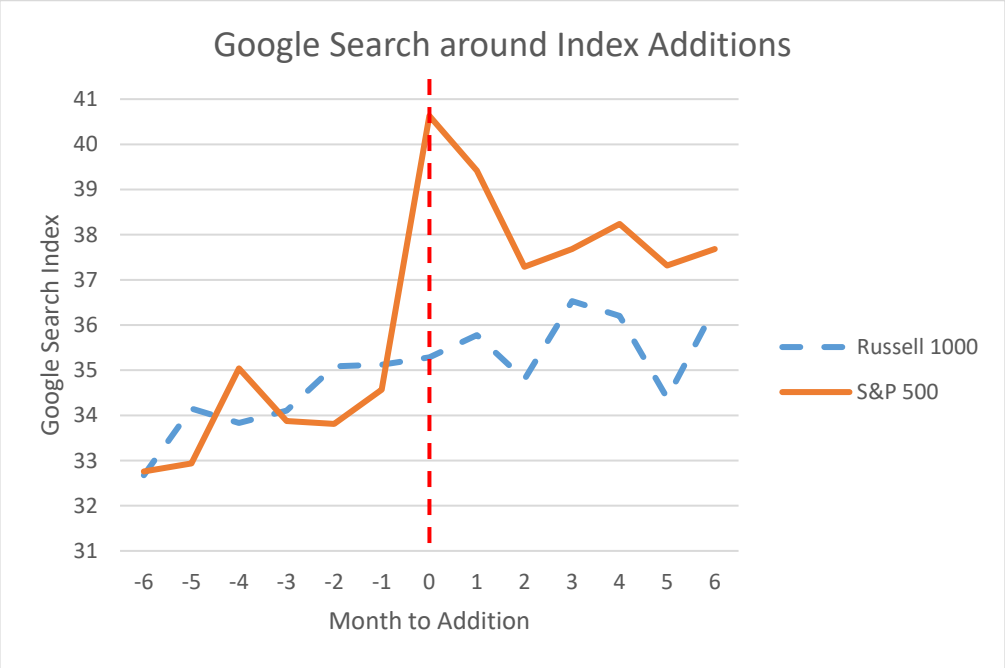
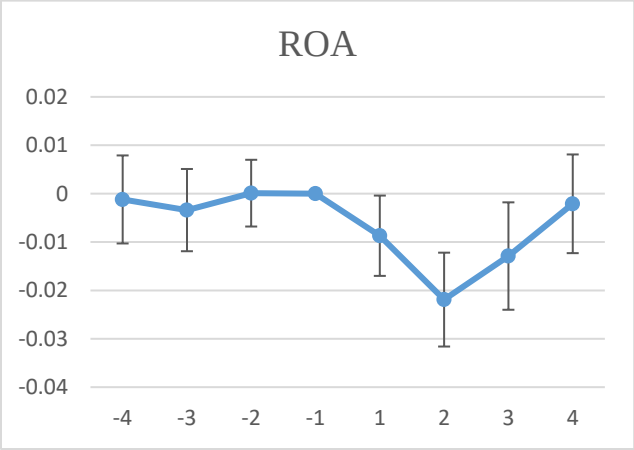


Figure 2. Performance and increase in attention

This figure illustrates the effects of S&P 500 inclusion on firm performance year by year. The performance measures include ROA and one-year CAR. ROA is net income scaled by total assets. CAR is the cumulative abnormal return within a fiscal year, where the abnormal returns are the differences between the monthly stock returns of a firm and the matched portfolio based on market capitalization, book-to-market, and prior-year return, following Daniel, Grinblatt, Titman and Wermers (1997). ROA (Panel A) and CAR (Panel B) are regressed on yearly indicator variables for each year relative to the year of S&P 500 inclusion, which equal one for treated firms in that year and zero otherwise, and control variables (as in Table 3). The Y-axis plots the coefficient estimates on the yearly indicator variables. The X-axis shows the year relative to an S&P 500 inclusion year. The year before inclusion is set as the base year and the inclusion year is dropped. The grey bars show the 95% confidence intervals of the coefficient estimates, where the confidence intervals are based on standard errors clustered at the firm level.

Panel A: ROA



Panel B: One-year CAR

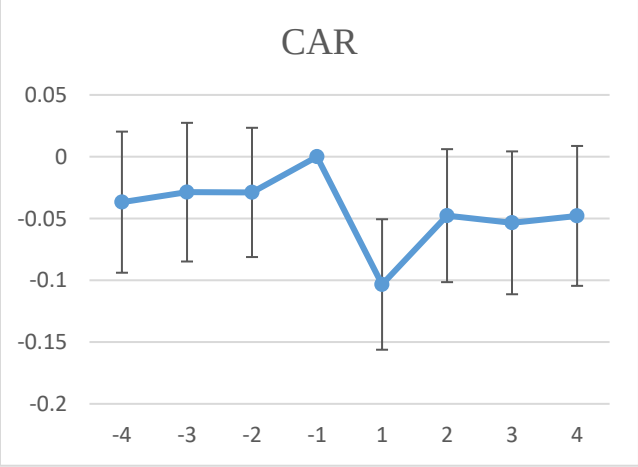


Figure 3: Investment and shocks to attention

This figure illustrates the effects of S&P 500 inclusion on Investment year by year. Investment is regressed on yearly indicator variables for each year relative to the year of S&P 500 inclusion, which equal one for treated firms in that year and zero otherwise, and control variables (those of Table 7). The Y-axis plots the coefficient estimates on the yearly indicator variables. The X-axis shows the year relative to an S&P 500 inclusion year. The year before inclusion is set as the base year and the inclusion year is dropped. The grey bars show the 95% confidence intervals of the coefficient estimates, where the confidence intervals are based on standard errors clustered at the firm level.

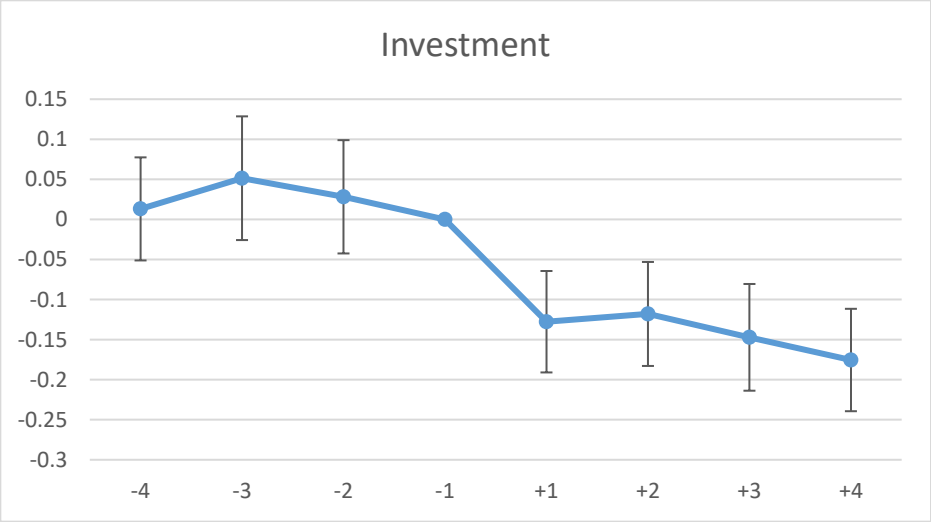
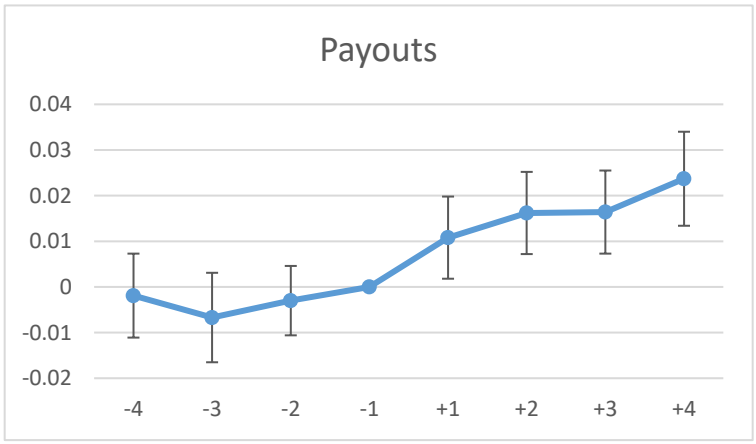


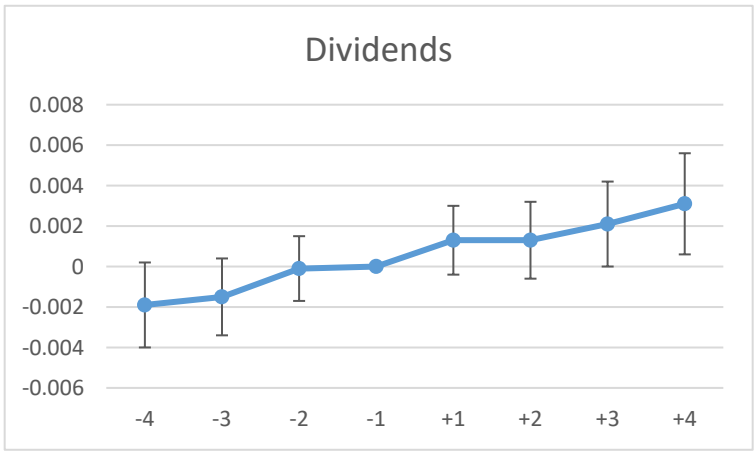
Figure 4: Payouts and shocks to attention

This figure illustrates the effects of S&P 500 inclusion on Payouts (Panel A), Dividends (Panel B), and Repurchases (Panel C) year by year. The relevant variables are regressed on yearly indicator variables for each year relative to the year of S&P 500 inclusion, which equal one for treated firms in that year and zero otherwise, and control variables (as of Table 8). The Y-axis plots the coefficient estimates on the yearly indicator variables. The X-axis shows the year relative to an S&P 500 inclusion year. The year before inclusion is set as the base year and the inclusion year is dropped. The grey bars show the 95% confidence intervals of the coefficient estimates, where the confidence intervals are based on standard errors clustered at the firm level.

Panel A: Total payouts



Panel B: Dividends



Panel C: Repurchases

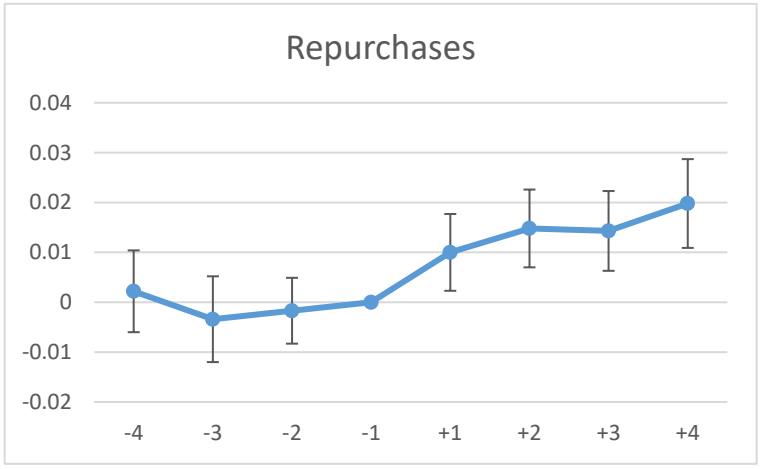


Table 1: Summary statistics

This table presents summary statistics. The sample includes treated firms added to the S&P 500 index and the matched control firms. Each treated firm is matched with two control firms from the control candidate pool, which are in the same industry (2-digit SIC) of the treated firm and have the closest market capitalization to the treated firm at the end of the calendar year before the year of the index inclusion. The control candidate pool is constructed following the official guidelines of S&P 500 index additions. The sample period is 1997 to 2017. Variables are winsorized at the 1st and 99th percentiles. Variable definitions are in the Appendix.

Variable	Mean	SD	p25	p50	p75	N
Log(Assets)	8.463	1.320	7.572	8.422	9.278	7,510
Tobin's *q*	2.355	1.817	1.239	1.719	2.697	7,510
Cash	0.141	0.159	0.025	0.078	0.200	7,507
Leverage	0.252	0.197	0.093	0.230	0.373	7,510
Capex	0.062	0.071	0.016	0.040	0.081	7,501
Cashflow	0.115	0.102	0.058	0.104	0.167	7,150
%SP500Peers	0.459	0.231	0.289	0.455	0.636	2,781
% SP500 Directors	0.267	0.232	0.100	0.222	0.400	5,049
Investment	0.198	0.43	0.010	0.089	0.224	7,501
Dividends	0.013	0.022	0.000	0.003	0.017	7,510
Repurchases	0.034	0.06	0.000	0.005	0.039	6,799
ROA	0.054	0.086	0.018	0.050	0.095	7,510
Return	0.202	0.514	-0.086	0.142	0.400	7,335
Volatility	0.025	0.013	0.016	0.022	0.031	6,804
Firm Age	23.763	17.097	10	18	36	7,510
Log(Analysts)	2.505	0.615	2.197	2.603	2.944	5,576
SEC Letter	0.234	0.438	0	0	0.693	7,510
Lawsuits	0.477	1.657	0	0	1	7,510
News_Re75	5.566	0.914	5.193	5.568	5.991	4,869
News_Re90	5.449	0.892	5.100	5.472	5.881	4,869

Table 2. Attention following S&P 500 index inclusion

This table shows the treatment effect of S&P 500 index inclusion on attention. Panel A reports the results about media news coverage. News_Re75 (News_Re90) is the natural logarithm of one plus the number of news covering a firm with relevance score above 75 (90), in which the relevance score is from RavenPack with the range between 0 and 100. Panel B reports the results about public attention, analyst attention, regulatory and legal attention, and shareholder proposal. Google is the average monthly Google search volume index from Google Trends (scaled by 100) within a firm-year. Log(Views) is the natural logarithm of the number of clicks and downloads of firms' SEC 10K and 10Q filings. Log(Analysts) is the natural logarithm of the number of analysts following a firm. SEC Letter, which is an indicator variable equal to one if a firm receives an SEC letter within a firm-year and zero otherwise. Lawsuits is the natural logarithm of one plus the number of federal district lawsuits within a firm-year. SH Proposals is the natural logarithm of one plus the number of a firm's shareholder proposals in a year. Sample periods for relevant tests depend on the data availability of the corresponding dependent variables. Specifically, sample for Panel A is 2000-2017. Sample for panel B is 2004-2017 for Column 1, 2007-2015 for Column 2, 1997-2017 for Columns 3, 4, 5, and 2003-2017 for Column 6. All specifications include firm and year fixed effects. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in the Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Media attention

	(1)	(2)
VARIABLES	News_Re75	News_Re90
SP500Add	0.119**	0.140***
	[2.33]	[2.86]
PreSP500Add	-0.040	-0.025
	[-1.26]	[-0.81]
Log(Assets)	0.658***	0.608***
	[3.17]	[3.15]
Log(Assets) Sq	-0.017	-0.015
	[-1.46]	[-1.38]
Tobin's *q*	0.084***	0.080***
	[5.62]	[5.63]
Cash	0.478	0.471
	[1.45]	[1.47]
Leverage	0.207	0.189
	[1.64]	[1.54]
Return	-0.096***	-0.089***
	[-4.68]	[-4.27]
Firm Age	0.023	0.016
	[0.73]	[0.53]
Volatility	6.070***	5.943***
	[4.88]	[4.77]
Observations	4,825	4,825
R-squared	0.836	0.836
Firm FE	Y	Y
Year FE	Y	Y

Panel B: Investor attention, analyst attention, regulatory attention, and legal attention

VARIABLES	(1) Google	(2) Log(Views)	(3) Log(Analysts)	(4) SH Proposals	(5) SEC Letter	(6) Lawsuits
SP500Add	0.033**	0.179**	0.072**	0.189***	0.038**	0.040*
	[2.38]	[2.28]	[2.44]	[3.37]	[1.96]	[1.87]
PreSP500Add	0.011	0.046	0.031	-0.018	-0.006	0.022
	[1.39]	[0.68]	[1.51]	[-0.40]	[-0.27]	[1.07]
Log(Assets)	-0.005	0.57	1.137***	0.043	-0.115**	-0.191**
	[-0.06]	[1.57]	[8.77]	[0.10]	[-1.99]	[-2.32]
Log(Assets) Sq	0.002	-0.018	-0.051***	0.012	0.009**	0.017***
	[0.37]	[-0.85]	[-6.90]	[0.42]	[2.41]	[3.32]
Tobin's *q*	0.012***	-0.008	0.042***	0.030	-0.010*	0.004
	[3.28]	[-0.19]	[5.09]	[1.22]	[-1.94]	[0.73]
Cash	-0.003	-0.480***	-0.123	-0.186	0.019	-0.133*
	[-0.05]	[-3.12]	[-1.30]	[-0.70]	[0.27]	[-1.75]
Leverage	-0.013	-0.005	-0.199***	0.013	0.071	-0.063
	[-0.36]	[-0.03]	[-2.95]	[0.07]	[1.18]	[-0.91]
Return	-0.016***	-0.084**	-0.107***	-0.007	0.006	-0.034***
	[-2.75]	[-2.06]	[-7.46]	[-0.18]	[0.55]	[-2.63]
Firm Age	-0.014	0.127*	-0.01	0.102	-0.017	-0.022
	[-0.96]	[1.87]	[-0.33]	[0.85]	[-0.51]	[-0.97]
Volatility	1.335***	4.391***	-1.163	5.917**	0.82	2.037**
	[2.78]	[3.38]	[-1.04]	[2.30]	[1.25]	[2.45]
Observations	3,430	2,182	4,720	3,545	5,952	5,952
R-squared	0.827	0.912	0.859	0.602	0.506	0.435
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table 3: Increase in attention and firm performance

This table shows the effects of S&P 500 inclusion on firm performance. Panel A reports the treatment effect of inclusion on ROA, revenues (scaled by assets), expenses (scaled by assets), profit margin (log(1+net income / revenue)), and one-year CAR. Panel B shows the corresponding effects of the increase in attention from S&P 500 inclusion. Attention_SP500 is the fitted value of the firm by firm regression: $\text{Attention}_{it} = \beta_0 + \beta_1 \cdot \text{SP500Add}_{it} + \varepsilon_{it}$, where Attention is the first component of PCA based on Log(Analysts), SEC letter, and Lawsuits, which are available in the full sample period. Column 2's in both panels report the results of placebo tests for ROA. The event window is four years before and four years after an addition year. The addition year is excluded. The sample period is 1997 to 2017. All specifications include firm and year fixed effects. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in the Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A. S&P 500 inclusion effects on ROA and CAR

VARIABLES	(1) ROA	(2) ROA(Placebo)	(3) Rev/Assets	(4) Expenses/Assets	(5) Profit Margin	(6) CAR
SP500Add	-0.013***	-0.006	0.021	0.034*	-0.020***	-0.039**
	[-3.03]	[-1.00]	[1.13]	[1.87]	[-2.77]	[-2.11]
PreSP500Add	0.000	0.007	0.011	0.011	-0.003	0.029
	[0.01]	[1.28]	[0.96]	[0.98]	[-0.48]	[1.32]
Log(Assets)	0.011**	0.008	-0.203***	-0.213***	0.028***	0.149***
	[2.55]	[0.42]	[-10.53]	[-10.93]	[3.37]	[6.67]
Tobin's *q*	0.018***	0.026***	0.030***	0.011***	0.020***	0.147***
	[11.62]	[2.78]	[6.38]	[2.62]	[6.61]	[18.38]
Cash	0.043*	0.033	-0.500***	-0.537***	0.125***	0.139
	[1.91]	[0.43]	[-7.14]	[-7.81]	[3.02]	[1.54]
Leverage	-0.130***	-0.194***	-0.167**	-0.045	-0.169***	-0.124*
	[-7.50]	[-4.19]	[-2.14]	[-0.59]	[-5.48]	[-1.72]
Volatility	-2.285***	-4.013***	-0.244	2.022***	-4.058***	-3.246***
	[-9.79]	[-3.81]	[-0.40]	[3.25]	[-9.44]	[-3.14]
Dividend	0.006	0.006	0.02	0.014	0.012	0.005
	[1.23]	[0.55]	[1.25]	[0.89]	[1.63]	[0.18]
Firm Age	0.007	0.009	0.036*	0.029	-0.001	-0.013
	[1.37]	[1.18]	[1.83]	[1.40]	[-0.09]	[-0.75]
Amihud	0.001	-0.015*	-0.031***	-0.032***	0.005	0.187***
	[0.40]	[-1.74]	[-4.25]	[-4.29]	[1.17]	[14.52]
Observations	5,495	3,303	5,495	5,495	5,449	4,971
R-squared	0.611	0.411	0.952	0.95	0.509	0.407
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Panel B. Increase in attention around S&P 500 inclusion and firm performance

VARIABLES	(1) ROA	(2) ROA(Placebo)	(3) Rev/Assets	(4) Expenses/Assets	(5) Profit Margin	(6) CAR
Attention_SP500	-0.012**	0.006	0.051**	0.063***	-0.018**	-0.045*
	[-2.28]	[0.63]	[2.55]	[3.30]	[-2.13]	[-1.72]
Log(Assets)	0.008*	-0.015	-0.239***	-0.245***	0.032***	0.172***
	[1.71]	[-1.50]	[-8.57]	[-8.83]	[3.40]	[6.18]
Tobin's *q*	0.017***	0.016***	0.028***	0.011**	0.017***	0.151***
	[8.92]	[4.58]	[4.94]	[2.08]	[5.39]	[17.10]
Cash	0.039	0.034	-0.438***	-0.470***	0.111**	0.232**
	[1.54]	[0.80]	[-5.37]	[-6.21]	[2.32]	[2.26]
Leverage	-0.134***	-0.130***	-0.180*	-0.055	-0.193***	-0.08
	[-7.19]	[-3.86]	[-1.87]	[-0.57]	[-5.66]	[-0.98]
Volatility	-2.197***	-2.075***	-1.188	0.992	-4.411***	-2.858**
	[-8.24]	[-5.16]	[-1.63]	[1.45]	[-9.24]	[-2.21]
Dividend	0.006	0.012	0.004	-0.001	0.008	-0.005
	[1.28]	[1.38]	[0.25]	[-0.07]	[1.08]	[-0.17]
Firm Age	0.005	0.008	0.036**	0.031	-0.006	-0.017
	[0.87]	[1.24]	[2.05]	[1.64]	[-0.71]	[-0.95]
Amihud	-0.003	-0.027***	-0.035***	-0.032***	0.003	0.192***
	[-1.00]	[-4.95]	[-3.93]	[-3.69]	[0.72]	[11.46]
Observations	4,273	2,294	4,273	4,273	4,252	3,918
R-squared	0.615	0.672	0.958	0.958	0.519	0.406
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table 4: Attention of included firms to other firms in the S&P 500 index

This table shows the treatment effect of S&P 500 inclusion on the attention of included firms to other S&P 500 firms. SP500 Views is the sum of a firm's downloads of SEC filings of all S&P 500 firms (excluding the firm itself) in a year. SP500 Peer Views is the sum of a firm's downloads of SEC filings of its S&P 500 peers (1-digit SIC) in a year. Log(·) is the natural logarithm function. The sample period is 2003-2016 due to data availability. All specifications include firm and year fixed effects. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in the Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
VARIABLES	Log(SP500 Views)	Log(SP500 Peer Views)
SP500Add	0.390**	0.313***
	[2.40]	[2.60]
PreSP500Add	0.085	0.141
	[0.58]	[1.31]
Log(Assets)	-0.096	-0.590
	[-0.13]	[-0.94]
Log(Assets) Sq	0.004	0.036
	[0.10]	[0.95]
Tobin's *q*	0.043	0.041
	[0.84]	[1.02]
Cash	-1.120**	-1.061**
	[-2.05]	[-2.41]
Leverage	-0.864**	-0.711**
	[-2.28]	[-2.47]
Return	-0.086	-0.052
	[-1.10]	[-0.87]
Firm Age	-0.423	-0.384
	[-1.49]	[-1.50]
Volatility	5.985	4.705
	[1.09]	[1.11]
Observations	3,637	3,637
R-squared	0.591	0.645
Firm FE	Y	Y
Year FE	Y	Y

Table 5: S&P 500 peer firms as performance benchmark in executive compensation

This table shows the treatment effect of S&P 500 index inclusion on CEO performance evaluation in executive compensation. %SP500Peer is the portion of S&P 500 peers in a CEO's peer group for the relative performance evaluation in her compensation contract. The data is available from 2006. Panel A shows the univariate evidence and compares %SP500Peers before and after a firm is added to the S&P 500 index. The *p*-value is for the *t*-test of mean equality. Panel B shows results of multivariate regressions. SP500Add is the S&P 500 addition indicator variable that is equal to one for treated firms after an addition year and zero otherwise. PreSP500Add is an indicator variable equal to one for treated firms one year prior to an addition year and zero otherwise. Both SP500Add and PreSP500Add equal zero for control firms. Model 1 (2) uses contemporaneous (lagged) control variables. Peer group data is from IncentiveLab. The event window is four years before and four years after an addition year. The addition year is excluded. The sample period is 2006 to 2017. All specifications include firm and year fixed effects. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Univariate evidence

	%SP500Peer	*p*-value (mean equality)
Before addition	0.413	0.001
After addition	0.509	

Panel B. DiD regressions

	(1)	(2)
VARIABLES	%SP500Peers	%SP500Peers
Controls	Contemporaneous	Lagged
SP500Add	0.068***	0.045***
	[3.63]	[2.69]
PreSP500Add	0.017	0.017
	[1.23]	[1.23]
Log(Assets)	0.118***	0.134***
	[7.47]	[7.46]
Tobin's *q*	0.015**	0.019***
	[2.55]	[3.36]
Cash	-0.082	0.011
	[-1.42]	[0.18]
Leverage	0.001	-0.028
	[0.02]	[-0.52]
Return	-0.030***	-0.019**
	[-4.23]	[-2.55]
Cashflow	-0.006	0.140*
	[-0.11]	[1.91]
Firm Age	-0.016	-0.035
	[-1.07]	[-1.46]
Observations	2,184	2,004
R-squared	0.846	0.838
Firm FE	Y	Y
Year FE	Y	Y

Table 6: Board member changes around S&P 500 inclusion

This table shows the treatment effect of S&P500 inclusion on the firms' board structure. % SP500 Directors is the fraction of directors with board experience in other S&P500 firms in or before the addition years. The board director data is from BoardEx since 1999. SP500Add is the S&P 500 addition indicator variable that is equal to one for treated firms after the addition year and zero otherwise. PreSP500Add is an indicator variable that is equal to one for treated firms one year prior to an addition year and zero otherwise. Both SP500Add and PreSP500Add equal zero for control firms. The event window is four years before and four years after a year of addition. The addition year is excluded. The sample period is 1999 to 2017. All specifications include firm and year fixed effects. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in the Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) % SP500 Directors	(2) % SP500 Directors
SP500Add	0.036***	0.033**
	[2.66]	[2.40]
PreSP500Add	0.010	0.011
	[1.26]	[1.33]
Log(Assets)	0.010	0.012
	[0.71]	[0.81]
Tobin's *q*	-0.001	-0.000
	[-0.21]	[-0.11]
Cash	-0.017	-0.025
	[-0.41]	[-0.60]
Leverage	-0.003	0.003
	[-0.08]	[0.08]
Firm Age	0.020	0.019
	[1.38]	[1.33]
Return		-0.002
		[-0.38]
Volatility		-0.366
		[-0.89]
Observations	4,389	4,307
R-squared	0.821	0.822
Firm FE	Y	Y
Year FE	Y	Y

Table 7: Corporate investment and increase in attention

This table shows the treatment effect of S&P 500 index inclusion on corporate investment. Investment is the annual change in total assets scaled by lagged total assets. Panel A shows differences in investment of S&P 500 firms and non-S&P 500 firms. SP500 is an indicator variable equal to one if a firm is a member of the S&P 500 index and zero otherwise. The test sample in Panel A includes all S&P 500 firms and the largest 500 non-S&P 500 firms (by market capitalization). Panel B shows the effect of S&P 500 additions on investment, capital expenditure (net of divestiture), R&D, acquisition, and the sum of the last three. SP500Add is the S&P 500 addition indicator variable that is equal to one for treated firms after an addition year and zero otherwise. PreSP500Add is an indicator variable equal to one for treated firms one year prior to an addition year and zero otherwise. Both SP500Add and PreSP500Add equal zero for control firms. Panel C shows the newly added firms' investment comovement with S&P 500 peers. Y_SP500Peer (Y_NonSP500Peer) is the average investment of (non-)S&P 500 peers in a firm's industry (4-digit SIC, excluding the firm itself). The event window in Panels B and C is four years before and four years after an addition year. The addition year is excluded. The sample period is 1997 to 2017. Specifications in Panel A include year and industry fixed effects to capture cross-sectional variation within industries (comparing S&P 500 firms and non-S&P 500 firms). Specifications in Panels B and C include firm and year fixed effects. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in the Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Investment of S&P 500 and non-S&P 500 firms

	(1)	(2)
VARIABLES	Investment	Investment
SP500	-0.181***	-0.121***
	[-8.85]	[-6.13]
Log(Assets)	0.175***	0.241***
	[2.83]	[3.89]
Log(Assets) Sq	-0.007**	-0.002
	[-2.29]	[-0.72]
Tobin's *q*	0.068***	0.044***
	[10.39]	[7.28]
Cashflow	-0.177*	0.019
	[-1.82]	[0.21]
Cash		0.043
		[0.71]
Leverage		0.195***
		[4.31]
Return		0.108***
		[10.81]
Firm Age		-0.023***
		[-20.27]
Volatility		-1.101***
		[-3.21]
Observations	18,914	15,368
R-squared	0.280	0.288
Industry FE	Y	Y
Year FE	Y	Y

Panel B. S&P 500 addition effects on investment

VARIABLES	(1) Investment	(2) Investment	(3) Capex + R&D + Acq	(4) Capex	(5) R&D	(6) Acq
SP500Add	-0.210***	-0.179***	-0.016**	-0.004	-0.002	-0.010*
	[-8.30]	[-7.00]	[-1.99]	[-1.39]	[-1.17]	[-1.67]
PreSP500Add	-0.040	-0.039	-0.007	0.001	-0.001	-0.008
	[-1.47]	[-1.48]	[-0.85]	[0.36]	[-0.29]	[-1.37]
Log(Assets)	-0.205*	0.079	-0.076**	-0.059***	-0.036***	0.026
	[-1.93]	[0.87]	[-2.50]	[-4.62]	[-3.07]	[1.59]
Log(Assets) Sq	0.024***	0.009*	0.005***	0.003***	0.002***	-0.001
	[3.80]	[1.70]	[2.83]	[4.76]	[2.67]	[-0.51]
Tobin's *q*	0.076***	0.037***	0.015***	0.006***	0.006***	0.001
	[7.16]	[4.01]	[5.30]	[5.28]	[4.95]	[1.10]
Cashflow	0.146	0.314***	-0.031	0.090***	-0.032*	-0.051**
	[1.12]	[2.77]	[-0.65]	[5.53]	[-1.87]	[-2.10]
Cash		0.299***	-0.218***	-0.048***	-0.027**	-0.142***
		[2.83]	[-6.04]	[-3.99]	[-2.13]	[-6.94]
Leverage		0.262***	0.141***	-0.007	0.002	0.142***
		[3.32]	[4.95]	[-0.70]	[0.35]	[7.69]
Return		0.098***	0.000	-0.007***	0.000	0.007**
		[5.86]	[0.10]	[-3.64]	[0.26]	[2.51]
Firm Age		-0.008	-0.008	-0.001	0.003**	-0.011
		[-0.33]	[-0.95]	[-0.71]	[2.25]	[-1.26]
Volatility		1.000	0.092	0.402***	0.059	-0.383**
		[1.02]	[0.33]	[3.36]	[0.70]	[-2.09]
Observations	6,255	5,924	5,924	5,924	5,924	5,924
R-squared	0.336	0.331	0.501	0.721	0.864	0.301
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Panel C. Investment comovement with S&P 500 peers

VARIABLES	(1) Investment	(2) Investment
Y_SP500Peer x SP500Add	0.450***	0.433***
	[3.63]	[3.48]
Y_SP500Peer	0.294***	0.290***
	[5.41]	[5.31]
Y_NonSP500Peer x SP500Add		-0.001
		[-0.46]
Y_NonSP500Peer		0.001
		[0.91]
Y_SP500Peer x PreSP500Add	0.083	0.087
	[0.55]	[0.58]
Y_NonSP500Peer x PreSP500Add		-0.001
		[-0.22]
SP500Add	-0.222***	-0.219***
	[-7.65]	[-7.49]
PreSP500Add	-0.039	-0.038
	[-1.13]	[-1.09]
Log(Assets)	-0.036	-0.034
	[-0.38]	[-0.35]
Log(Assets) Sq	0.013**	0.013**
	[2.30]	[2.28]
Tobin's *q*	0.034***	0.034***
	[3.32]	[3.35]
Cash	0.385***	0.380***
	[3.49]	[3.42]
Leverage	0.270***	0.267***
	[3.39]	[3.35]
Cashflow	0.216**	0.212*
	[1.97]	[1.91]
Return	0.085***	0.087***
	[4.48]	[4.57]
Firm Age	0.007	0.007
	[0.55]	[0.55]
Volatility	-0.422	-0.411
	[-0.43]	[-0.41]
Observations	4,923	4,904
R-squared	0.396	0.393
Firm FE	Y	Y
Year FE	Y	Y

Table 8: Payouts and increase in attention

This table shows the treatment effect of S&P 500 index inclusion on corporate payouts. Dividends is the dollar amount of dividends paid to common stock scaled by total assets. Repurchases is the dollar amount of repurchases scaled by total assets. Payouts is the sum of Dividends and Repurchases. Panel A shows differences in payouts of S&P 500 firms and non-S&P 500 firms. SP500 is an indicator variable equal to one if a firm is a member of the S&P 500 index and zero otherwise. The test sample in Panel A includes all S&P 500 firms and the largest 500 non-S&P 500 firms (by market capitalization). Panel B shows the effect of S&P 500 additions on payouts. SP500Add is the S&P 500 addition indicator variable that is equal to one for treated firms after an addition year and zero otherwise. PreSP500Add is an indicator variable equal to one for treated firms one year prior to an addition year and zero otherwise. Both SP500Add and PreSP500Add equal zero for control firms. Panel C shows the newly added firms' payout comovement with that of S&P 500 peers. Y_SP500Peer (Y_NonSP500Peer) is the average Dividends, Repurchases, or Payouts of (non-)S&P 500 peers in a firm's industry (4-digit SIC, excluding the firm itself), corresponding to the dependent variable in the regression. The event window in Panels B and C is four years before and four years after an addition year. The addition year is excluded. The sample period is 1997 to 2017. Specifications in Panel A include year and industry fixed effects to capture cross-sectional variation within industries (comparing S&P 500 firms and non-S&P 500 firms). Specifications in Panels B and C include firm and year fixed effects. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in the Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Payouts of S&P 500 and non-S&P 500 firms

	(1)	(2)	(3)
VARIABLES	Dividends	Repurchases	Payouts
SP500	-0.002**	0.019***	0.017***
	[-2.56]	[11.05]	[9.35]
Log(Assets)	0.000	-0.004***	-0.003***
	[1.12]	[-5.66]	[-4.62]
Tobin's *q*	0.003***	0.003***	0.007***
	[6.81]	[4.36]	[6.92]
Cashflow	0.097***	0.200***	0.313***
	[14.90]	[16.02]	[21.29]
Cash	-0.001	0.027***	0.026***
	[-0.18]	[3.62]	[2.99]
Leverage	0.006**	0.022***	0.031***
	[2.08]	[4.05]	[5.05]
Return	-0.006***	-0.009***	-0.016***
	[-10.45]	[-8.30]	[-11.98]
Volatility	-0.426***	-0.398***	-0.819***
	[-12.12]	[-6.14]	[-10.70]
Amihud	0.000	-0.001***	-0.001***
	[1.50]	[-4.25]	[-2.82]
Firm Age	0.000***	-0.000**	0.000
	[5.45]	[-2.02]	[0.98]
Observations	15,713	14,693	14,693
R-squared	0.376	0.328	0.417
Industry FE	Y	Y	Y
Year FE	Y	Y	Y

Panel B. S&P 500 addition effects on payouts

VARIABLES	(1) Dividends	(2) Repurchases	(3) Payouts
SP500Add	0.002**	0.016***	0.019***
	[2.45]	[4.03]	[4.56]
PreSP500Add	0.001	0.002	0.004
	[1.37]	[0.60]	[1.29]
Log(Assets)	-0.004***	-0.018***	-0.024***
	[-5.15]	[-5.95]	[-6.62]
Tobin's *q*	0.000**	0.001	0.002
	[2.09]	[0.62]	[1.31]
Cashflow	0.007*	0.154***	0.170***
	[1.95]	[7.63]	[7.82]
Cash	-0.001	-0.037**	-0.038**
	[-0.17]	[-2.17]	[-1.99]
Leverage	0.003	0.044***	0.061***
	[1.05]	[3.09]	[3.67]
Return	-0.001	-0.008***	-0.009***
	[-1.51]	[-3.96]	[-3.98]
Volatility	-0.134***	-0.469***	-0.637***
	[-4.76]	[-3.30]	[-4.05]
Amihud	-0.002***	-0.009***	-0.012***
	[-4.40]	[-5.85]	[-6.53]
Firm Age	0.002	0.006*	0.008*
	[0.92]	[1.81]	[1.89]
Observations	5,243	4,756	4,756
R-squared	0.818	0.575	0.625
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

Panel C. Payouts comovement with S&P 500 peers

VARIABLES	(1) Dividends	(2) Dividends	(3) Repurchases	(4) Repurchases	(5) Payouts	(6) Payouts
Y_SP500Peer x SP500Add	0.187**	0.213**	0.537***	0.539***	0.524***	0.548***
	[2.07]	[2.34]	[6.01]	[5.93]	[6.17]	[6.48]
Y_SP500Peer	0.304***	0.293***	0.221***	0.215***	0.313***	0.301***
	[4.68]	[4.56]	[4.74]	[4.63]	[5.36]	[5.19]
Y_NonSP500Peer x SP500Add		-0.082**		0.032		-0.193**
		[-2.10]		[0.71]		[-2.35]
Y_NonSP500Peer		0.065***		0.004		0.218***
		[2.73]		[1.23]		[3.65]
Y_SP500Peer x PreSP500Add	-0.034	-0.027	0.020	0.011	0.020	0.021
	[-0.55]	[-0.41]	[0.31]	[0.17]	[0.28]	[0.28]
Y_NonSP500Peer x PreSP500Add		-0.036		0.153		-0.051
		[-1.09]		[0.94]		[-0.45]
SP500Add	-0.000	0.001	-0.007	-0.007	-0.010*	-0.006
	[-0.06]	[0.55]	[-1.45]	[-1.57]	[-1.93]	[-1.04]
PreSP500Add	0.001	0.002	0.001	-0.001	0.003	0.004
	[1.07]	[1.37]	[0.31]	[-0.29]	[0.62]	[0.84]
Log(Assets)	-0.003***	-0.003***	-0.018***	-0.018***	-0.021***	-0.021***
	[-4.02]	[-4.07]	[-5.81]	[-5.76]	[-5.95]	[-5.94]
Tobin's *q*	0.000	0.000	-0.001	-0.001	0.001	0.001
	[1.61]	[1.57]	[-0.49]	[-0.48]	[0.32]	[0.31]
Cashflow	0.010***	0.009***	0.125***	0.126***	0.140***	0.137***
	[2.89]	[2.79]	[6.05]	[6.04]	[6.43]	[6.44]
Cash	-0.000	-0.001	-0.036**	-0.035*	-0.038*	-0.038*
	[-0.10]	[-0.26]	[-2.01]	[-1.92]	[-1.86]	[-1.89]
Leverage	0.002	0.002	0.027**	0.027**	0.036**	0.036**
	[0.67]	[0.66]	[1.98]	[1.97]	[2.24]	[2.30]
Return	-0.000	-0.000	-0.003	-0.003	-0.004*	-0.004*
	[-1.25]	[-1.14]	[-1.44]	[-1.43]	[-1.88]	[-1.81]
Volatility	-0.105***	-0.107***	-0.319**	-0.319**	-0.441***	-0.462***
	[-3.51]	[-3.57]	[-2.31]	[-2.30]	[-2.78]	[-2.87]
Amihud	-0.002***	-0.002***	-0.010***	-0.010***	-0.012***	-0.012***
	[-4.01]	[-4.14]	[-6.08]	[-6.03]	[-6.58]	[-6.60]
Firm Age	0.002	0.001	0.007**	0.007*	0.008**	0.008*
	[0.98]	[0.94]	[1.98]	[1.91]	[2.09]	[1.88]
Observations	4,531	4,514	4,063	4,044	4,063	4,044
R-squared	0.847	0.844	0.633	0.631	0.685	0.681
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table 9: Increase in attention and similarity of firm policies

This table shows the effect of the increase in attention from S&P 500 inclusion on the similarity of firm policies. Y_SP500Peer is the average policy variable of S&P 500 peers in a firm's industry (4-digit SIC, excluding the firm itself), corresponding to the dependent variable in the regression. Attention_SP500 is the fitted value of the firm-by-firm regression: $\text{Attention}_{it} = \beta_0 + \beta_1 \cdot \text{SP500Add}_{it} + \varepsilon_{it}$, where Attention is the first component of PCA based on Log(Analysts), SEC letter, and Lawsuits, which are available in the full sample period, SP500Add is an indicator variable that equals one for a treated firm after its addition year and zero otherwise, and ε_{it} is the error term. The event window is four years before and four years after an addition year. The addition year is excluded. The sample period is 1997 to 2017. All specifications include firm and year fixed effects. Control variables are same to that in Tables 7 and 8, respectively, and coefficients of controls are not reported here. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in the Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) Investment	(2) Dividends	(3) Repurchases	(4) Payouts
Y_SP500Peer x Attention_SP500	0.221*	0.130*	0.318***	0.335***
	[1.76]	[1.78]	[4.48]	[5.01]
Y_SP500Peer	0.338***	0.237***	0.363***	0.323***
	[6.35]	[4.77]	[8.38]	[7.63]
Attention_SP500	-0.223***	-0.000	0.003	-0.000
	[-5.56]	[-0.11]	[0.71]	[-0.03]
Observations	3,634	3,492	3,168	3,168
R-squared	0.395	0.857	0.639	0.689
Controls	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

Table 10: Increase in attention and similarity of firm policies, controlling for changes in passive holdings

This table shows the effects of the increase in attention from S&P 500 inclusion on firm policies. Y_SP500Peer is the average policy variable of S&P 500 peers in a firm's industry (4-digit SIC, excluding the firm itself), corresponding to the dependent variable in the regression. Attention_SP500 is the fitted value of the firm-by-firm regression: $\text{Attention}_{it} = \beta_0 + \beta_1 \cdot \text{SP500Add}_{it} + \varepsilon_{it}$, where Attention is the first component of PCA based on Log(Analysts), SEC letter, and Lawsuits, which are available in the full sample period, SP500Add is an indicator variable that equals one for a treated firm after its addition year and zero otherwise, and ε_{it} is the error term. Ch(Passive) is the first difference in a firm's passive ownership in a year. The event window is four years before and four years after an addition year. The addition year is excluded. The sample period is 1997 to 2017. All specifications include firm and year fixed effects. Control variables are same to that in Tables 7 and 8, respectively, and their coefficients are not reported here. The *t*-statistics are reported in brackets. Robust standard errors are clustered at the firm level. Variable definitions are in the Appendix. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) Investment	(2) Dividends	(3) Repurchases	(4) Payouts
Y_SP500Peer x Attention_SP500	0.226*	0.084	0.310***	0.331***
	[1.82]	[1.43]	[4.40]	[4.95]
Y_SP500Peer	0.343***	0.208***	0.350***	0.313***
	[6.14]	[4.43]	[7.79]	[6.91]
Attention_SP500	-0.237***	0.000	0.005	0.001
	[-5.55]	[0.47]	[0.92]	[0.18]
Ch(Passive) x Y_SP500Peer	5.339	0.043	2.911	2.437
	[1.36]	[0.05]	[1.38]	[1.21]
Ch(Passive)	-0.570	0.005	-0.164**	-0.184*
	[-1.50]	[0.44]	[-2.18]	[-1.91]
Observations	3,244	3,099	2,816	2,816
R-squared	0.424	0.876	0.661	0.705
Controls	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y