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Index Fund Ownership and Stock Price Efficiency: Evidence from Quarterly Earnings Seasons

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Index Fund Ownership and Stock Price Efficiency:
Evidence from Quarterly Earnings Seasons

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by

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Abstract

While prior research argues that individual investors benefit from a switch to passive investment in index funds (French 2008, Bond and García 2022), higher levels of index fund ownership of firm shares lead to competing factors that influence a firm's price efficiency (i.e., the speed and accuracy with which a firm's stock price reflects investor consensus on the information provided about a firm). If relative investor sophistication increases as index fund ownership increases, there is a benefit to the firm's price efficiency. Yet, more shares held passively limit the shares available for investors to actively incorporate firm news, adversely impacting price efficiency. In this study, I consider these two competing factors using alternative sources of firm information during its earnings season to explore the impact of index fund ownership on a firm's stock price efficiency. I find evidence of decreased investor disagreement associated with a firm's earnings announcement, indicating a benefit to the firm's price efficiency. Yet, I also find the decrease in investor participation from higher levels of index fund ownership adversely affects a firm's price efficiency when incorporating information based on investor expectations of firm performance from peer disclosures. These contextualized results provide no conclusive evidence on the total impact of index fund ownership at currently observed levels, but should continue to be studied as passive investment increases over time.

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I. Introduction

Mutual funds and exchange-traded funds (ETFs) centralize investment decisions to a manager who follows the specific goals of the fund. Passive index funds are the full population of mutual funds and ETFs where the stated objective is to match the performance of an underlying index. Due to the simplicity of the investment strategy and savings on fees, investment in index funds has grown over time, with the average firm in the S&P 500 now having about 21.2% of its shares held by index funds as of March 2022.[1] While prior research argues that individual investors benefit from a switch to passive investment in index funds (French 2008, Bond and García 2022), higher levels of index fund ownership of firm shares lead to competing factors that influence a firm's price efficiency (i.e., the speed and accuracy with which a firm's stock price reflects investor consensus on the information provided about a firm). If, as posed by Bond and García (2022), the marginal index investor is relatively less informed than the remaining active investors, then aggregate investor sophistication increases as index fund ownership increases. Yet, increases in index fund ownership of a firm also imply a decrease in the proportion of investors actively incorporating information revealed about a firm into their trading decisions. In this study, I consider these two competing factors using alternative sources of firm information during its earnings season to explore the impact of index fund ownership on a firm's stock price efficiency.

Recent theoretical research provides conflicting arguments on the impact of passive ownership on the efficiency of a firm's stock price. Bond and García (2022) argue that the marginal index investor is less informed than the remaining active investors and, as such, greater index fund ownership of firm shares will increase the relative price efficiency of the firm. Baruch and Zhang (2021) argue that greater index fund ownership is detrimental to the price discovery process as

[1] https://www.etfstream.com/news/passive-ownership-of-sp-500-doubles-in-seven-years/

fewer investors actively participate, on the presumption that each of these investors is equally informed. In empirical research, a common proxy for passive ownership is ETF inclusion or proportion of firm shares held by ETFs (i.e., Israeli et al. 2017, Bhojraj et al. 2020, Glosten et al. 2021). Yet, not only do these studies find conflicting results on the impact of ETF ownership on price efficiency, but use of ETFs underweights the impact of passive investors.[2] Using a quasi-exogenous increase to index investment, Coles et al. (2022) find no effect on a firm's price efficiency. However, they state that it is unclear whether their results hold for larger changes or higher levels of index fund ownership. Thus, use of index fund ownership as a proxy for passive investment provides new insight to the conflicting arguments from theoretical research and improves upon the use of other proxies from empirical research to explore the impact on a firm's stock price efficiency.

Using a comprehensive sample from 2010 through 2019, I assess how index fund ownership affects a firm's price efficiency during its earnings season. Specifically, I consider how a firm's returns and investor trading activity are impacted by the proportion of firm shares held by passively managed index funds in the days surrounding its earnings announcement. To the extent passive ownership impacts the price discovery process following the disclosure of firm news, I also consider any impact to the associated post-earnings announcement drift (PEAD). I find that, upon disclosure of a firm's earnings surprise, higher index fund ownership is associated with higher abnormal returns and lower abnormal volume in the days surrounding a firm's quarterly earnings announcement, as well as a decrease to the firm's PEAD. Taken together, these results indicate decreased investor disagreement associated with the earnings news disclosed and a benefit to the firm's stock price efficiency in reflecting investor consensus.

[2] For example, mean ETF ownership in Israeli et al. (2017) and Glosten et al. (2021) is 3.3% and 3.6%, respectively. Mean index fund ownership in my sample is 10.8%.

My initial results provide support for the theory from Bond and García (2022) and studies evaluating the investor sophistication of firms. If the marginal index investor is less informed then, as index fund ownership of a firm increases, the relative investor sophistication of a firm increases as the remaining investors hold informational advantages that benefit them more than a change to a passive portfolio. Thus, an increase in the investor sophistication of a firm benefits the firm's stock price efficiency (e.g., Bartov et al. 2000, Collins et al. 2003). While I find evidence of a decrease in investor disagreement, another stream of prior literature finds that decreased investor participation in the price discovery process adversely affects a firm's price efficiency (e.g., Sims 2003, Hirshleifer et al. 2011).

I next consider intra-industry information transfer between firms as an alternative source of firm information provided in the same earnings season that is differentially affected by investor participation. Ball and Brown (1968, p. 161) theorize that knowledge of a past relation between the income of firms and current information about income of these other firms "yields a conditional expectation for the present income of a firm". As more information is provided by related peers, investors' expectations of a firm's upcoming earnings announcement are reflected in their trading activity. Evidence of this information transfer has been found in investor reaction to earlier announcing firms (Foster 1981; Han and Wild 1990; Freeman and Tse 1992). Once a firm's own earnings are announced, investors correct their expectations derived from earlier announcing peer firms (Thomas and Zhang 2008). Yet, the effect of information transfer between firms and the associated correction at a firm's earnings announcement date are conditional on investor participation in extracting information from peer disclosures. Thus, higher levels of index fund ownership approximate the population of investors who are, by design, either inattentive or

unaware of firm news, which prior literature has found to detrimentally affect a firm's price efficiency (e.g., Sims 2003, Hirshleifer et al. 2011).

To explore how the decrease in investor participation affects the price discovery process, I first assess investor response and trading activity for a firm during the earnings announcements of its earlier reporting industry peers. I find that higher levels of index fund ownership have a mitigating effect on the amount of information transfer that occurs between industry peers through both returns and trading activity during a firm's pre-earnings announcement period. Next, I consider how information transfer in the presence of index fund ownership impacts investor response and trading activity at a firm's earnings announcement date. Thomas and Zhang (2008) find that greater information transfer is negatively associated with a firm's abnormal return at its earnings announcement date, providing evidence that investors overreact to news provided by peers and correct their expectations once the firm's performance is revealed. I find that higher levels of index fund ownership mitigate this correction and are associated with less trading activity.

Due to the muted effect of the initial information transfer, it is unclear whether the observed mitigated correction at a firm's earnings announcement date is due to the smaller magnitude of the correction required or lack of investor consensus on information provided by peer disclosures. As a result, I consider the firm's PEAD associated with the information transfer observed. I find that higher levels of index fund ownership extend a firm's PEAD from information transfer, indicating a delay in investor consensus. Thus, the decrease in investor participation from higher levels of index fund ownership adversely affects a firm's price efficiency when incorporating information based on investor expectations of firm performance from peer disclosures.

Given alternative sources of firm information, index fund ownership has differential effects on a firm's stock price efficiency as relative investor sophistication increases and investor

participation decreases. In additional analyses, I consider how these effects are interrelated. Specifically, I exploit a firm's information environment to isolate firms where the remaining active investors are more likely to be better informed. That is, if the marginal index investor is relatively less informed, then the investors who choose to remain active participants are those with a greater informational advantage and this association is stronger for firms with weaker information environments. Using cross-sectional analyses based on firm size and analyst following, I find that the increased abnormal return, decreased abnormal volume, and decreased PEAD associated with a firm's earnings announcement from my initial results is entirely driven by firms with weaker information environments. I find no effect for firms with a stronger information environment.

Yet, it is unclear whether an investor's firm-specific informational advantage benefits the price discovery process surrounding information provided by peer firms as investor participation decreases with higher levels of index fund ownership. I employ the same cross-sectional split of my sample based on firm size and analyst following to test the firm's abnormal return, abnormal volume, and PEAD at its earnings announcement date in the presence of industry information transfer. I find no differences in the results of the subsamples employed, indicating a null effect of the informational advantage for the remaining active investors in weaker information environments when firm information is derived from investor participation. Taken together, my results provide evidence of the competing factors from index fund ownership's impact on a firm's price efficiency. There is a benefit to the incorporation of firm-specific news, but solely when the remaining active investors have a relative informational advantage. Yet, the decrease in investor participation detrimentally affects the price discovery process for a firm when incorporating news provided by peer firms.

These conflicting inferences from the impact of index fund ownership on a firm's stock price efficiency suggest a nonlinear relationship. That is, current levels of index fund ownership only benefit a firm's price efficiency when the remaining active investors are better informed about firm-specific information through a decrease to investor disagreement surrounding a firm's earnings announcement. Since index fund ownership is projected to continue increasing, there is potential for the observed benefit to a firm's price efficiency to be subsumed as the remaining active investors hold fewer shares to trade and incorporate firm information. In further additional analyses, I retest my main analyses with an incremental approach to index fund ownership to gain insight on how differing levels of index fund ownership impact price efficiency. Using indicator variables for index fund ownership within specified ranges (i.e., 5% to 10%, 10% to 15%, etc.), I reconsider the impact to a firm's abnormal return, abnormal volume, and PEAD at its earnings announcement date. I find evidence that my main results are driven by firms with greater than 15% index fund ownership. Yet, I also find evidence of a potential inflection point at which the benefit to a firm's stock price efficiency will decrease as index fund ownership continues to increase. Because there are relatively few observations in the population of firms with the highest levels of index fund ownership, I leave this exploration to future research as index funds continue to grow.

This study makes several contributions to the literature. First, it provides new insight on how recent shifts in investor composition impact the incorporation of information. As total index fund ownership continues to grow, a smaller proportion of firm shares is available to actively trade when news is provided. While prior literature has explored the impact of ETFs, the exclusion of passively managed mutual funds underweights the impact of passive investors (e.g., Israeli et al. 2017, Bhojraj et al. 2020, Glosten et al. 2021). This is the first study to isolate the magnitude of a

firm's index fund ownership as a direct measure of a firm's passive investors to examine its effects on a firm's stock price efficiency.

Second, combined with the results from Thomas and Zhang (2008), this study contributes to the information transfer literature. Thomas and Zhang (2008) find that greater intra-industry information transfer from a firm's earlier reporting peers is corrected once a firm's own performance is revealed on its earnings announcement date. Bhojraj et al. (2020) find that the presence of broad-based ETF ownership adversely impacts this correction. Expanding passive ownership to all passively managed index funds, I find that the effect found by Bhojraj et al. (2020) is increasing in the total percentage of shares held by index investors. Thus, the incorporation of information provided by peer firms is subject to investor participation in the price discovery process.

Finally, to my knowledge, this is the first study that provides an empirical approach to identifying what level of passive investment impacts a firm's stock price efficiency. Theoretical studies by Bond and García (2022) and Baruch and Zhang (2021) explore up to full ownership of firm shares by index investors to make arguments about impacts to investor welfare and price efficiency, respectively. Coles et al. (2022) exploit a quasi-exogenous shock to index fund ownership and find no impact to stock price efficiency, indicating that the information gathering and trading activities taken by the remaining active investors are sufficient to keep the firm's stock price informative and efficient. Yet, mean index fund ownership in their study is 9% and they note that their inferences may not extend to higher levels of index fund ownership or larger changes than the ones explored. Thus, my results suggest that greater than 15% index fund ownership impacts the incorporation of earnings news and provide new empirical evidence to the debate surrounding the impact of passive ownership on firm stock price efficiency.

II. Prior Literature

Seminal accounting research established the foundational relationship between the accounting information provided by a firm and its value (e.g., Beaver 1968, Ball and Brown 1968). Yet, a firm's stock price does not fully reflect the information disclosed by the firm (Bernard and Thomas 1990, Sloan 1996). Prior literature has found that this disconnect between available information and stock price is driven by the existence of other, privately acquired information, processing costs of disclosures, or inattentive investors, among other factors (DellaVigna and Pollet 2009, Cespa and Vives 2015, Blankespoor et al. 2020). Because an index fund's strategy is to replicate the performance of its underlying index, information provided by firms is not actively incorporated by these shareholders. Furthermore, theoretical literature of index fund ownership and empirical research which uses ETF ownership as a proxy for passive investment provides mixed evidence on the impact of these passive investment vehicles on a firm's stock price efficiency.

Passive Investment and Price Efficiency

Prior literature commonly uses a firm's ETF ownership as a proxy for passive ownership of the firm (e.g., Israeli et al. 2017, Bhojraj et al. 2020, Glosten et al. 2021). These studies find mixed results as they relate to the impact of passive ownership on a firm's price efficiency. Glosten et al. (2021) find an association between greater ETF ownership and increased price efficiency related to a firm's earnings announcement, but only for firms with weaker information environments. Israeli et al. (2017) find an association between greater ETF ownership and higher transaction costs, indicating a decrease in price efficiency. Additionally, Ben-David et al. (2018) find an increase to non-fundamental stock volatility associated with an increase to ETF ownership. While this result implies a decrease to a firm's price efficiency as the stock is impacted by a

systemic shock and not the firm's fundamentals, Bhojraj et al. (2020) find that the increased comovement of stock prices in the same ETF are only detrimental when the ETF is broad-based (i.e., track the S&P 500, Russell 1000, etc.) and not sector-based.

Not only are results from prior literature inconsistent on the impact of ETF ownership on a firm's price efficiency, but the use of ETF ownership does not capture the larger population of a firm's passive investor ownership. Additionally, although both ETFs and index mutual funds are components of a firm's total institutional investors, the subclassifications of institutional investors employed by Bushee (1988) are at the institution level. A necessary additional consideration is the amount of agency that institutional investors have given their investment strategy within the portfolios and funds that make up a total institution. Thus, use of index fund ownership as a proxy for passive investment provides a more comprehensive approach than use of ETF ownership and a more granular approach than use of institutional ownership subclassifications. Yet, limited theoretical and empirical research of index fund ownership also provide conflicting arguments on the impact to price efficiency.

Baruch and Zhang (2021) consider the impact on a firm's stock price efficiency as passive investment reaches total ownership of a firm. The underlying theory motivating how they consider their capital asset pricing model is that index investors do not actively participate in a firm's stock price discovery. With the assumption that a firm's non-index investors are well-informed, a decrease in the population of a firm's investors that actively incorporate firm news adversely affects a firm's stock price efficiency. As a result, greater index fund ownership decreases the statistical fit of Baruch and Zhang's (2021) capital asset pricing model and increases asset comovement. Thus, as index funds reach full ownership of a firm's stock, a firm's stock price will not incorporate the full amount of information known about a firm.

Bond and García (2022) motivate the growth in index fund ownership with investor utility. Specifically, the lower fees charged by index funds entice more investors to participate in the market through these funds, which allows fees to remain low and, in turn, draw in more investors and increase investor welfare. A key assumption for Bond and García (2022) is that the marginal index fund investor is less informed than the remaining active investors. Thus, as index fund ownership increases, they argue that the relative price efficiency of an individual stock will increase. Yet, they also note that the price efficiency of stocks covered by an index is lower than for stocks outside of an index. Taken together, inclusion in an index has an adverse effect on the price efficiency of a stock that is less pronounced as index fund ownership increases. If price efficiency for these stocks remains lower than those outside of an index, then it is unclear whether the increases to relative price efficiency from greater index fund ownership reach a level at which total price efficiency of an individual stock reaches pre-index inclusion levels. Furthermore, there are additional considerations beyond a firm's investor composition when evaluating the price efficiency of a firm.

Processing Costs of Public Information

Blankespoor et al. (2020) posit that the time and effort needed to evaluate public information represent key processing costs for investors. As a result, public disclosures are not free information, as the ability to process the information differs among investors to the point where a greater ability to process disclosures provides some investors with an informational advantage. This is supported by Cready (1988), who finds that the processing speed of earnings announcement information is associated with the wealth of market participants. That is, investors with greater ability and benefit to process earnings announcement information do so quicker than

investors with lower ability. Thus, public information behaves more like private information between investors of varying processing capabilities and resources.

Equating processing costs of public information to acquisition costs of private information introduces the potential for a firm's stock price to be less informative in displaying investor consensus. Greater costs of attaining and incorporating firm information inherently keep the market from being efficient, as stated by Grossman and Stiglitz (1980). As a result, investors take part in imperfect competition, where Kyle (1989, p. 345) theorizes that "traders keep prices inefficient enough to create profit incentives adequate to encourage traders to purchase costly private information". However, in the case of insiders, trades on otherwise unattainable private information lead to less efficient stock prices (Fishman and Hagerty 1992). Thus, the efficiency of a firm's stock price is subject to a balance between the information available about a firm, the cost of acquiring and processing firm information, and an investor's willingness to trade on the information. Disparities in the information known by investors not only support the view that the market exists in a state of imperfect competition, but also point to the existence of multiple price equilibria for differentially informed investors when taken in conjunction with trading volatility and investor liquidity (Cespa and Vives 2015).

This theoretical argument, combined with the view that the incorporation of public information is constrained by processing costs, illustrates how firm stock prices do not fully reflect all information available when investors are differentially informed. As processing costs increase, a firm will experience investor underreaction to news (Blankespoor et al. 2020; Banerjee et al. 2020). Yet, it is unclear whether higher levels of index fund ownership decrease investor disagreement as relative investor sophistication increases or increase processing costs as fewer shares are available for trading activity.

Competing Factors of Index Fund Ownership

Bond and García (2022) posit that the marginal index investor is less informed than the remaining active investors. As such, there is a net benefit to a firm's investor sophistication as index fund ownership increases. Commonly in prior literature, investor sophistication is measured using institutional ownership of firm shares. Studies find that greater institutional ownership decreases a firm's post-earnings announcement drift (Bartov et al. 2000, Collins et al. 2003). Bushee (1998) provides evidence that not all institutional investors behave in the same fashion, and that subclassifications of institutional investors provide additional insight to their trading behavior. Using these subclassifications, Ke and Ramalingegowda (2005) find that transient institutional investors, otherwise known as the most active of the subclassifications, decrease a firm's PEAD as they actively trade on the firm information provided. Yet, their ability to do so is limited by transaction costs, which prior literature suggests are increased by passive ownership as fewer shares are available for trading (Israeli et al. 2017). Thus, decreased share availability due to passive ownership by index funds is similar to an increase in the population of firm shares held by unaware investors.

Lack of investor awareness to firm news causes a delay in the price response to firm information, which leads to the stock price itself being less informative (Sims 2003; Hirshleifer, et al. 2011). Prior literature finds that investor awareness is impacted by factors such as busy earnings news days (Hirshleifer et al. 2009), distraction from the upcoming weekend (DellaVigna and Pollet 2009), and a lack of capacity to intake all firm information (Lu 2020). Additionally, firms strategically disclose bad news when investors are more distracted, such as aftermarket hours or on busy news days (deHaan et al. 2015). Thus, investors are caught unaware of a firm's information disclosure due to self-imposed attention constraints or firm actions. Yet, when

considering index fund ownership, awareness of individual investors is irrelevant. Instead, these investors do not participate in the price discovery process due to the passive investment strategy employed.

Coles et al. (2022), empirically explore this distinction directly using a quasi-exogenous increase to index fund ownership. By exploiting Russell 1000 and Russell 2000 index reconstitutions, Coles et al. (2022) identify the firms that switch from the Russell 1000 index to the Russell 2000 index. This change leads to an average index fund ownership increase of 2%, a non-trivial number of firm shares. They find that this increase to a firm's index fund ownership has no impact on the stock's price efficiency. They also find that the increase to index fund ownership decreases information gathering activities by investors. A key assumption in their conclusion is that the information gathering and trading activities taken by the remaining active investors are sufficient to keep the firm's stock price informative and efficient. Thus, a growth in index fund ownership leads to a reconstitution of firm investors such that there is no net effect on a firm's stock price efficiency. If passive index investors are similar to unaware investors, this null effect on a firm's price efficiency indicates that the remaining active investors overcome the detrimental effect of awareness costs for the firm.

III. Hypotheses Development

Coles et al. (2022) note that their inferences may not extend to higher levels of index fund ownership or larger changes than the ones explored.[3] Additionally, the theoretical studies on index fund ownership (Baruch and Zhang 2021, Bond and García 2022) provide conflicting arguments on the impact to a firm's price efficiency due to differences in their underlying assumptions. Studies that proxy for passive investment using ETF ownership underweight the total shares held

[3] Additionally, within my sample, I approximate that less than 0.5% of my observations experience a switch from the Russell 1000 to the Russell 2000 index, or vice-versa.

by passive investment vehicles. If higher levels of passive investment through index fund ownership decrease necessary activity in the price discovery process, then there is a detrimental effect to the firm's price efficiency (Baruch and Zhang 2021). However, if there is a reconstitution of the remaining active investors such that they are not affected by fewer investors participating in the price discovery process, there is no effect to a firm's price efficiency (Coles et al. 2022). Finally, if the marginal index investor is less informed than the remaining active investors, then higher levels of index fund ownership lead to an increase in investor sophistication such that there is a benefit to the firm's price efficiency (Bond and García 2022). Thus, empirically evaluating levels of index fund ownership provides new insight to the debate surrounding the impact of passive investment on the incorporation of information disclosed about a firm.

H1: Index fund ownership has no impact on the incorporation of firm news.

A firm's earnings announcement is not the only source of information about firm performance during an earnings season. Prior literature has theorized and captured the impact of intra-industry information transfer, where earnings announcements of related firms impact the returns of non-announcing firms. However, information transfer between firms is conditional on investor participation in the price discovery process following peer firms' earnings announcements. Thomas and Zhang (2008) find that greater information transfer from earlier announcing peer firms bears a negative association with a firm's returns at its own earnings announcement date, indicating a correction of investor overreaction to news from peer firms. Thus, a decrease to information transfer between firms benefits price efficiency if the decrease to investor participation also mitigates investor overreaction to peer earnings announcements. However, lack of investor participation extends the price discovery process in reflecting the "correct" amount of firm information provided by peer earnings announcements.

Bhojraj et al. (2020) find that ETF ownership mitigates the correction found by Thomas and Zhang (2008). Though this result provides initial evidence of the differential impact of investor composition on the correction of information transfer, it does not capture the magnitude of passive investment achievable through identifying total index fund ownership. As a result, the extent to which index fund ownership impacts the price discovery process related to information transfer between firms remains unexplored.

H2: Index fund ownership has no impact on the incorporation of information provided by peer firms.

IV. Sample Construction

The sample employed begins at the intersection of Compustat, CRSP, IBES, and Thomson Reuters to capture firm fundamentals, investor trading activity, analyst forecasts, and institutional ownership information, respectively. Following Rawson and Rowe (2022), total index fund ownership is derived from the CRSP Mutual Fund Database and supplemented by hand collection of fund investment strategies from required proxy statements.[4] I calculate my measure of index fund ownership, *Index %*, as the percentage of shares held by index funds divided by total common shares outstanding. The initial sample includes all quarterly observations for calendar year-end firms for the years 2010 to 2019.[5]

Tests of intra-industry information transfer for H2 require identifying a firm's industry and its sequential order in announcing earnings relative to industry peers. To define a firm's earnings season, firms are grouped into Fama-French 48 industry classifications.[6] As discussed in Section V, information transfer variables are calculated based on averages of peer firms. As a result,

[4] I thank Caleb Rawson and Stephen Rowe for sharing the code and data necessary to calculate index fund ownership per firm-quarter. For additional detail, refer to Rawson and Rowe (2022).
[5] Zhu (2020) documents an increase in the overall coverage of the CRSP Mutual Fund Database in 2010 relative to prior years. For consistency, I do not include earlier years in which the coverage provided by CRSP was weaker.
[6] Information transfer variables are calculated following Thomas and Zhang (2008) who classify industries using 4-digit SIC codes. Inferences from my empirical analyses remain unchanged if using this alternative classification.

industry quarters with less than 10 firm observations are deleted from the sample to ensure information transfer is neither over- nor under-estimated by firms with few industry peers.[7] Additionally, firms classified into the "Miscellaneous" industry are dropped, as there is no theoretical argument for considering information transfer between these firms to be a result of related performance. Finally, firms with missing key variables or controls are dropped from the sample for a final sample of 49,338 observations.

(Table 1)

V. Descriptive Statistics and Correlations

Descriptive statistics for the sample are presented in Table 2 and univariate correlations are presented in Table 3. Notably, *Index %* has an interquartile range of roughly 6.4% to 14.3%. Yet, index fund ownership has increased over time. When considering *Index %* by year, the interquartile range in 2010 is roughly 3.6% to 8.8% while the range in 2019 is roughly 10.1% to 21.9%. To the extent index fund ownership impacts investor behavior surrounding news disclosures from peer firms, this indicates a growing influence from these passive investors. Tests of H1 use the firm's own earnings announcement as the information event considered for tests of investor response. Following prior literature, unexpected earnings are decile ranked by quarter (*RSUE*) and used to evaluate abnormal returns (*ARET*) and abnormal volume (*ABVOL*) surrounding the firm's earnings announcement date, and a firm's post-earnings announcement drift (*PEAD*). These variables are evenly distributed, with the returns variables (*ARET, PEAD*) centering near zero, indicating a mix of investor response to firm earnings news.

Tests of H2 consider the earnings announcements of peer firms as an alternative information event for the focal firm. Commonly in prior literature, information transfer is

[7] Results from empirical analyses are robust to softening this restriction. Specifically, results remain robust to limiting the sample to industry quarters with at least 5 firm observations and applying no limitation.

calculated as the relationship between a non-announcing firm's returns and a news-announcing peer firm's returns on the date of the news announcement. While this approach treats each news announcement and peer-firm pairing as individual observations, the approach by Thomas and Zhang (2008) provides a consolidated view of information transfer during a firm's pre-earnings announcement period. Specifically, within an earnings season, they calculate an average three-day cumulative abnormal return for a firm centered on the earnings announcement dates of its earlier reporting industry peers.[8] As defined, *RESP* is then used to evaluate how greater information transfer impacts a firm's abnormal return at their own earnings announcement date.[9] This returns measure also centers near zero, indicating that investors have mixed perceptions of whether earlier peer earnings announcements provide good or bad news about the focal firm.

(Table 2)

A correlation matrix is provided in Table 3. *Index %* has weak univariate correlations with all returns-based measures (e.g., *ARET*, *RESP*, *PEAD*) while carrying a stronger correlation with abnormal volume (*ABVOL*), analyst following, and size. The expected relationship of a firm's earnings surprise (*RSUE*) and its abnormal return, abnormal volume, and post-earnings announcement drift is found, with statistically significant univariate correlations between the measures. The information transfer variable (*RESP*) also carries weak univariate correlations with the investor response variables, providing univariate evidence that investor response during the earnings announcements of peer firms influence investor response once the firm provides its own earnings announcement.

[8] Thomas and Zhang (2008) define earlier reporting industry peers as firms within the same 4-digit SIC code with an earnings announcement date more than 5 days before the observation firm. As previously noted, inferences remain unchanged when utilizing 4-digit SIC codes as the industry classification. Additionally, results remain robust to increasing the window of time used for matching peer firms to 3 days before the observation firm's earnings announcement date.

[9] Returns measures are calculated using a three-day window and Fama-French 3-Factor adjusted returns. Results are robust to using two-day windows (day t+0 to day t+1), market-weighted returns, and a combination of the two.

(Table 3)

VI. Empirical Analyses

The relationship between a firm's own earnings news and its value has long been established in the literature (e.g., Beaver 1968, Ball and Brown 1968, Bernard and Thomas 1990, Sloan 1996). To the extent that passive investors impact the price discovery process by increasing the relative investor sophistication of the firm or by limiting the shares available for active investors to incorporate information, it is unclear whether this investment strategy has any effect on the stock price efficiency of a firm. For tests of H1, I consider how index fund ownership impacts the incorporation of a firm's own earnings news. For tests of H2, I consider how index fund ownership affects the price discovery process surrounding peer earnings announcements and the associated industry information transfer.

Tests of H1: Firm Unexpected Earnings and Index Fund Ownership

The most direct information source of a firm's performance during an earnings season is its earnings announcement. Total investor reaction to news provided by a firm will be impacted by the investor composition of a firm. In this study, index fund ownership approximates the population of a firm's investors that employ a passive investment strategy. To capture the differential impact of index fund ownership on investor response and trading activity following firm news, an interaction term is employed in Equation 1.

$$DV_{i,t} = \beta_0 + \beta_1 Index\ \%_{i,t} + \beta_2 RSUE_{i,t} + Index\ \%\ x\ RSUE_{i,t} + Controls_{i,t} + \varepsilon \qquad (1)$$

The dependent variables employed in Equation 1 are the firm's abnormal return in the three days surrounding its earnings announcement to capture the firm's earnings response coefficient (*ARET*), abnormal trading volume in the three days surrounding its earnings announcement

(*ABVOL*), and the firm's post-earnings announcement drift (*PEAD*).[10] Both trading volume and returns are assessed since, as posed by Kim and Verrecchia (1991, p. 316), "the use of volume in conjunction with returns could identify systematic differences in investors' knowledge or other characteristics which result in different reactions to public announcements". Unexpected earnings (*RSUE*) are calculated as the firm's median earnings surprise based on analyst expectations and scaled by stock price at the end of the quarter, decile ranked by quarter (Bernard and Thomas 1989). In testing abnormal volume, the absolute value of a firm's unexpected earnings is used when decile ranking by quarter.

Controls employed are categorized to capture different factors that influence investor response during news events. I utilize investor environment controls and firm fundamental controls. Investor environment controls include *Non-Index Inst. Own.*, *BA_Spread*, and *Amihud*. *Non-Index Inst. Own.* measures the percentage of firm shares owned by institutions not captured by the *Index%* variable or, alternatively stated, a firm's active institutional ownership. [11] Both the average quarterly bid-ask spread (*BA_Spread*) and *Amihud* control for investor disagreement and illiquidity from greater transaction costs. I employ controls for firm characteristics: size (*Size*), the book-to-market ratio (*Log_BTM*), returns momentum (*Momentum*), and analyst following (*Analyst*). Additionally, I use a firm's decile-ranked unexpected earnings from the prior quarter

[10] More recent studies evaluating a firm's earnings response coefficient use a model fully interacted with a firm's unexpected earnings (e.g., deHaan et al. 2017). This approach allows for a more complete assessment of how controls can confound the relationship between variables (deHaan et al. 2021). For ease of interpretation and comparison with other results at a firm's earnings announcement date, Table 4 displays results for a non-fully interacted model. However, results remain robust and inferences remain unchanged if a fully interacted model is utilized.

[11] Bushee (1998) provides evidence that not all institutional investors behave in the same fashion, and that subclassifications can be employed to better understand their trading behavior. Rawson and Rowe (2022) perform an analysis comparing the hand-collected index fund classifications also used in this study with Bushee's (1998) institutional classifications (transient, quasi-index, dedicated). Descriptively, they find that index funds are largely managed by dedicated institutions and a minority are managed by quasi-index institutions. Additionally, results from their study indicate that index funds should not be conflated with quasi-index institutions as they are not interchangeable classifications.

and prior year quarter to control for potential mean reversion of expectations based on prior period performance ($RSUE_{t-1}$, $RSUE_{t-4}$). Industry and quarter fixed effects are employed to control for industry-specific, time invarying factors and seasonality. Variable definitions are provided in Appendix A.

Results for tests of Equation 1 are presented in Table 4. In Column 1, the expected positive base relationship between a firm's unexpected earnings (*RSUE*) and its abnormal return (*ARET*) is found. When including index fund ownership in Column 2, this base effect remains positive while the interaction term displays an incremental benefit to the firm's abnormal return, indicating an increase in the efficiency of incorporating firm news. A firm's news also drives greater trading activity, evidenced by the positive and significant coefficient on the base effect of |*RSUE*| in Column 3. However, the interaction term in Column 4 between a firm's magnitude of unexpected earnings (|*RSUE*|) and index fund ownership (*Index %*) bears a negative, and significant, association with abnormal trading activity (*ABVOL*). Although greater earnings surprises are associated with more trading activity, this relationship is mitigated by index fund ownership.

Although there is less trading activity found for firms with index fund ownership in the presence of higher unexpected earnings, the greater abnormal return results indicate a decrease in the investor disagreement surrounding firm performance by the remaining active investors. That is, a firm's remaining active investors reach a faster consensus on what the information provided by the firm in its earnings announcement means for the firm's valuation. Tests of a firm's PEAD provide additional support for this inference. Though a firm's unexpected earnings increase its PEAD in Column 5, this effect is mitigated as more firm shares are held by passive index investors in Column 6. Taken together with the results from a firm's abnormal returns and abnormal trading volume surrounding its earnings announcement, a greater proportion of firm shares held by passive

index investors allows the remaining active investors to more efficiently incorporate information provided about the firm.

(Table 4)

Tests of H2: Index Fund Ownership and Industry Information Transfer

Alternative theory of the effect of passive investment on a firm's stock price efficiency proposed by Baruch and Zhang (2021) states that, as index fund ownership reaches full ownership of a firm, price efficiency will deteriorate. With fewer investors participating in the price discovery process, Baruch and Zhang (2021) base their theory on the assumption that each investor is equally informed (and, thus, the decrease to a firm's price efficiency is driven by a lack of participation from the marginal index investor). However, results from tests of H1 indicate that decreased investor participation (as proxied by abnormal trading volume) benefits the stock price efficiency of a firm as its earnings response coefficient increases and its PEAD decreases. Yet, tests of H1 solely consider investor participation once firm news is provided. I next consider the impact of index fund ownership on industry information transfer, where investor participation is necessary for reflecting expectations of firm performance and arriving at a consensus once firm performance is revealed.

Ball and Brown (1967) and Ramnath (2002) argue that investor reaction for a firm during a peer firm's earnings announcement is driven by the market or industry information discernable from the peer's disclosure. Han and Wild (1990) find that unexpected earnings reported by early announcing firms impacts returns for non-announcing peer firms, providing evidence of synchronous information transfer between firms. Additionally, management forecasts and conference calls are other sources of information transfer within an industry (Baginski 1987, Brochet et al. 2018). Though these papers provide evidence of the existence of information

transfer, how much information transfer occurs is contingent on the investor participation surrounding news provided by an industry peer.

If firm shares held by index funds are inactive due to the passive investment strategy that index funds follow, then the intra-industry information transfer between firms is likely affected by a firm's investor composition. As previously defined, the *RESP* variable captures the firm's average investor response at the earnings announcement dates of its earlier announcing peer firms. Additionally, Thomas and Zhang (2008) control for *EARLYPRARET*, or the average investor response for peer firms at their earnings announcement dates. Since information transfer in prior literature is largely captured as the association between returns of a non-announcing firm and its announcing peer, it can be inferred that before a firm provides the market with its earnings announcement, the average returns for peer firms captured by *EARLYPRARET* is the source of intra-industry information transfer.

$$DV_{i,t} = \beta_0 + \beta_1 Index\,\%_{i,t} + \beta_2 EARLYPRARET_{i,t} + \beta_3 Index\,\%\; x\; EARLYPRARET_{i,t} + Controls_{i,t} + \varepsilon \quad (2)$$

The dependent variables tested (*DV*) during a firm's pre-earnings announcement period are measured using *RESP* and *RESP_ABVOL*. I use *RESP* as a dependent variable for the assessment of index fund ownership impact on intra-industry information transfer. To continue evaluating investor trading activity, I calculate a new measure of share turnover (*RESP_ABVOL*). Using the same logic employed in the calculation of *RESP*, I find average abnormal volume for the three-day periods surrounding peer firm earnings announcements.

Investor environment and firm fundamental controls from Equation 1 are still employed. Additionally, because information transfer between firms is subject to the earnings announcements of earlier reporting peer firms, I employ earnings season controls. These controls capture factors that can influence investor response to peer firm news and the timing of a firm's earnings

announcement relative to its earlier announcing peer firms. Because response to peer firm earnings announcements may also be impacted by the peer firm's investor composition, I control for median index fund ownership of these earlier announcing peer firms (*Early Peer Index %*). Later announcing firms are given less attention, while earlier announcing firms receive greater returns (deHaan et al. 2015; Savor and Wilson 2016). To control for timing, I calculate the cumulative sum of early peer firm market value and divide it by total industry market value (*Early Industry%*). I also control for the firm's own market share, calculated as the firm's market value divided by total industry market value (*Firm Importance*). Finally, I control for the number of days since the earnings announcement of the first reporting industry peer in the quarter (*Pre-Season Length*). Industry and quarter fixed effects are used in Equation 2.

Table 5 presents results evaluating both average investor response (*RESP*) and average abnormal volume (*RESP_ABVOL*) during the earnings announcement of earlier reporting peers. Results in Column 1 support prior literature, as the average investor response for peer firms on their earnings announcement dates (*EARLYPRARET*) increases the average investor response for the non-announcing firm. However, in the presence of index fund ownership, the information transfer between firms is mitigated, evidenced by the negative and significant interaction term in Column 2.

While information transfer has historically been measured as the association between firm returns, considering investor trading activity provides additional context to the underlying investor choices driving information transfer. Specifically, greater abnormal volume for non-announcing firms in the presence of greater abnormal returns for their peers indicates that investors use the information from peer firm earnings announcements to make trading decisions. Column 3 supports this argument, as the positive and significant coefficient for |*EARLYPRARET*| presents a positive

association with average abnormal volume for the non-announcing firm. Once again, Column 4 presents a negative and significant coefficient for the interaction term, depicting a mitigation effect associated with index fund ownership. Taken together, my results of a firm's pre-earnings announcement period indicate that index fund ownership is associated with a lack of investor participation that limits the amount of information transfer that occurs between peer firms.

(Table 5)

Although information transfer is theoretically driven by the market or industry information discernable from the peer's disclosure, discerning relevant information from peer disclosures is not precise. Specifically, Ramnath (2002) documents that analyst forecast errors are positively related between the first announcing firm in an industry and subsequent announcing firms when, instead, their accuracy should be increasing in the absence of bias. Additionally, Thomas and Zhang (2008) find that investors overreact to the information provided by earlier reporting peer firms, with a correction to the overreaction taking place on a firm's own earnings announcement date. This finding indicates a difference in the timing between when information is revealed and when it is reflected in a firm's stock price. While use of Equation 2 examined the impact of index fund ownership on information transfer, I next use Equation 3 to consider how index fund ownership and information transfer affect a firm's price efficiency once the firm reveals its own performance at its earnings announcement date.

$$DV_{i,t} = \beta_0 + \beta_1 Index\,\%_{i,t} + \beta_2 RESP + \beta_3 Index\,\%\; x\; RESP_{i,t} + Controls_{i,t} + \varepsilon \qquad (3)$$

As previously defined, the *RESP* variable captures the firm's average investor response at the earnings announcement dates of its earlier announcing peer firms. The dependent variables employed with Equation 3 are the same as those used in Equation 1 (*ARET*, *ABVOL*, *PEAD*) as I aim to capture the effect of information transfer once a firm's own earnings are provided (and,

thus, once investors have the full information necessary to assess how "correct" their expectations of firm performance were based on peer performance). Investor environment and firm fundamental controls from Equation 1 and Equation 2 are still employed. Additionally, I continue to use the earnings season controls from Equation 2. Finally, I control for the firm's own unexpected earnings (*RSUE*) to isolate the impact of firm performance on investor response. Industry and quarter fixed effects are used in Equation 3.

Table 6 provides results for the impact of index fund ownership on the association between information transfer and investor response during and after the firm's earnings announcement date. Column 1 documents the expected base relationship between a firm's pre-earnings announcement information transfer (*RESP*) and its earnings announcement abnormal return (*ARET*). In line with the results from Thomas and Zhang (2008), as a firm experienced greater information transfer, these elevated expectations of a firm's performance are corrected once the firm's own performance is revealed. However, once index fund ownership is introduced in Column 2, I observe a mitigation to the correction found in Thomas and Zhang (2008). As more firm shares are held by index funds, the correction for overestimation to news provided by earlier reporting peers (captured by the negative and significant coefficient on *RESP*) is weaker due to the positive and significant coefficient on the interaction term.

Columns 3 and 4 of Table 6 present results for tests of abnormal trading volume at the firm's earnings announcement date. While tests of abnormal returns provide the outcome of evaluating the impact of index fund ownership on the association between information transfer and a firm's earnings announcement return, tests of abnormal trading volume provide insight to the underlying investor trading choices during the same period. In Column 3, *RESP* is shown with a positive and significant coefficient, indicating greater trading volume during the earnings

announcement period. This relationship persists in Column 4, though the interaction term is negative and significant. Index fund ownership continues to mitigate the investor response associated with information transfer.

Taken together with the results from Columns 1 and 2, the correction to overestimation of information transfer captured by *RESP* is driven by greater investor trading activity. Additionally, the mitigation of this correction associated with index fund ownership is driven by less investor trading activity. These results indicate a difference in the pricing of information and trading activity due to investor composition of a firm during a firm's earnings season. However, an alternative explanation is that the decrease to information transfer observed in Table 5 leads to a lower correction required once a firm provides its own earnings announcement. Thus, it is unclear whether the decrease in investor participation surrounding news provided by peer firms is detrimental or beneficial to a firm's price efficiency.

To assess this further, I next consider the impact to a firm's PEAD in Columns 5 and 6 of Table 6. Greater information transfer extends a firm's PEAD, as evidenced by the positive and significant coefficient for *RESP* in Column 5. This effect appears to be driven by firms with relatively greater index fund ownership, as the coefficient for the interaction term is positive and significant in Column 6 while the base coefficient for *RESP* becomes insignificant. These results indicate that the mitigated correction to information transfer which takes place at a firm's earnings announcement date extends a firm's PEAD. Thus, fewer investors participating in the price discovery process adversely affect a firm's price efficiency.

(Table 6)

VII. Additional Analyses

Results from tests of H1 provide empirical evidence that greater passive investment through index fund ownership benefits the stock price efficiency of a firm in reflecting firm news. These results also align with the theory proposed by Bond and García (2022), where the marginal index investor is less informed than the remaining active investors such that a firm's price efficiency increases as index investment increases. Yet, the tests employed for H1 do not take into consideration how investors can be differentially informed, limiting the support that results from tests of H1 can provide to the theory from Bond and García (2022).

To explore this theory more directly, I consider the strength of a firm's information environment. Firms with weaker information environments have less informed investors relative to firms with stronger information environments due to availability of information from press releases, analysts, regulators, or other sources. Additionally, a greater analyst following has been found to increase the amount of firm-specific information available to investors (Crawford et al. 2012). Glosten et al. (2021) find that passive ownership (as proxied by ETF ownership) benefits a firm's stock price efficiency, but only for firms with weaker information environments. If the marginal index investor is relatively less informed, then the remaining active investors for firms with weaker information environments have a relatively stronger informational advantage than the remaining active investors for firms with stronger information environments. To assess this, I employ cross-sectional analyses where I split my sample based on median firm size and analyst following in each quarter. Using these split samples, I reassess results from tests of H1 to consider the effect of investor sophistication.

Panel A of Table 7 presents the results of the cross-sectional analyses using a sample split on median firm size within the quarter. For each dependent variable (abnormal returns, abnormal

volume, and PEAD), results are provided for the subsets of smaller and larger firms. A test of means is employed to consider the differences in the interaction term for the split sample. I find results consistent with those presented for tests of H1 (Table 4), but only for firms with relatively weaker information environments. I find no association between the dependent variables for investor response and the interaction effect of a firm's unexpected earnings and its proportion of index fund ownership. Furthermore, the tests of means for the coefficients in each specification of Equation 1 present a statistically significant difference between the interaction term for smaller firms and larger firms. Thus, the benefit to a firm's stock price efficiency from relatively greater index fund ownership is only present for firms where investor sophistication is more likely to theoretically increase with fewer active investors.

Panel B of Table 7 presents the results of the cross-sectional analyses using a sample split on median analyst following within the quarter. Inferences are largely identical to those from Panel A of Table 7. That is, the increase to a firm's abnormal return, decrease to abnormal trading volume, and decrease to PEAD are solely present for firms with a weaker information environment, as proxied by a relatively smaller analyst following. As there is less firm-specific information available to investors, there is evidence to suggest that relatively greater index fund ownership benefits the incorporation of information for less informed investors. These results provide evidence of an inter-relation between a firm's investor composition and sophistication such that independent evaluation of passive ownership is insufficient in understanding the effect on a firm's stock price efficiency.

(Table 7)

Results from tests of H2 provide empirical evidence that greater passive investment through index fund ownership adversely affects the stock price efficiency of a firm in reflecting

investor consensus on firm news discernable from peer disclosures. As previously noted, information transfer between firms is conditional on investor participation surrounding peer news earnings announcements. The decrease in trading volume surrounding peer earnings announcements associated with higher levels of index fund ownership decreases the information transfer that occurs between firms and leads to a delay in the pricing of firm information. Yet, given results from H1, relative investor sophistication should increase such that a decrease in investor disagreement benefits a firm's price efficiency. Thus, I consider the interrelated effects of investor sophistication and participation by using the same split-sample analyses used in Table 7 for the effects of information transfer on the firm's earnings announcement date.

Panels A and B of Table 8 provide no evidence that the relative informational advantage of a firm's remaining active investors affects the efficiency with which a firm's stock price reflects information provided by peer firm earnings announcements. That is, there is no significant difference in the interacted effect of index fund ownership (*Index %*) and the observed information transfer (*RESP*) between smaller and larger firms or firms with fewer analysts following and greater analysts following when considering abnormal returns, abnormal volume, or PEAD surrounding a firm's earnings announcement date. Because information transfer between firms is contingent on investor participation in discerning the firm-relevant component of peer earnings, this alternative source of firm information during the earnings season is differentially affected by index fund ownership, regardless of the informational advantage held by the remaining active investors.

(Table 8)

To further explore results from tests of H1, I consider whether there is an identifiable level of index fund ownership within my sample which affects the incorporation of firm information. I

decompose my *Index %* variable into binned indicator variables depending on the percentage of firm shares held by index funds. That is, I create an indicator variable equal to 1 for index fund ownership at 5% increments. Each of these indicator variables is interacted with a firm's unexpected earnings (*RSUE*) in tests of a firm's abnormal return, abnormal volume, and PEAD. Using index fund ownership between 0 and 5% as the baseline, results for the analysis are provided in Table 9. Controls and the base effects for the indicator variables are suppressed. Additionally, Figures 1, 2, and 3 provide a line graph for the coefficients on the interaction terms in tests of abnormal returns, abnormal volume, and PEAD, respectively.

Interestingly, the results for a firm's abnormal return display an almost monotonic increase associated with higher levels of index fund ownership. The largest increase in abnormal returns is associated with the increase from the 15 to 20% bucket to the 20 to 25% bucket. Yet, the decrease from the 20 to 25% bucket provides weak evidence of a potential inflection point. Tests of abnormal volume indicate a monotonic decrease in trading volume as index fund ownership increases, though there is an insignificant coefficient for the 15 to 20% bucket which makes this finding inconclusive. Finally, tests of a firm's PEAD indicate a potential inflection point at the 15 to 20% index fund ownership bucket. That is, the decreased PEAD effect potentially reverses as index fund ownership continues to increase. Whether index fund ownership reaches a level at which it is no longer beneficial to the incorporation of firm news and potentially detrimental is an area of future research as index fund ownership continues to grow.

(Table 9)

Although results from tests of H1 indicate a decrease in investor disagreement in the incorporation of firm earnings news associated with higher levels of index fund ownership, whether this affects investor response during future periods remains unexplored. I next consider

how index fund ownership in the previous quarter and the firm's previous quarter earnings surprise affect current period abnormal returns, abnormal volume, and PEAD. If the decrease in investor disagreement evidenced in the current period reflects better investor accuracy in pricing firm information, then there should be no reversal or no effect in future periods. In Table 10, I find a negative and significant interaction term from the previous quarter associated with abnormal returns, while also finding no significant effect on abnormal volume and PEAD. Thus, there is no conclusive evidence that the decrease to investor disagreement in earlier tests leads to a multi-period effect associated with the same earnings release.

(Table 10)

With index fund ownership increasing throughout the sample (and projected to increase in future years), it is possible that earlier results are driven by a trend in the growth of index fund ownership over time. To assess this, I provide results from two alternative approaches. First, in Table 11, I include a time trend variable to control for the effect of the growth in index fund ownership over time and continue to find robust results to earlier tests of H1. Second, I run my main tests of H1 by individual years and I provide linear graphs of the coefficient on the interaction term of interest over time. Figures 4, 5, and 6 present results for tests of abnormal returns, abnormal volume, and PEAD, respectively. I do not find evidence that my main results are driven by the later years in my sample.

(Table 11)

I next consider whether index fund ownership impacts the investor reaction to other firm news. Specifically, I identify dates of firm 8-K releases and calculate absolute abnormal returns and abnormal volumes in the days surrounding the 8-K release date. I use absolute abnormal returns to consider the amount of information provided, without consideration of the directionality

that the information provides (i.e., no assumption is made on whether the 8-K provides good or bad firm news). In Table 12, I find that higher levels of index fund ownership are associated with greater absolute abnormal returns and less abnormal trading volume for firm 8-K releases, providing additional evidence of a decrease in investor disagreement to firm news.

(Table 12)

Finally, results from tests of H2 can be driven by the identification of the industries used. To consider this further, I create pseudo-industries based on a representative sample of the full population used when initially assigning the Fama-French 48 industries. Using a randomized approach, each observation is placed into one of the Fama-French 48 industries such that I am able to recalculate reporting order and information transfer variables within an earnings season. Table 13 provides the results of using these pseudo-industries. I find weak evidence that these pseudo-industries behave in the same fashion as initial tests of H2. While the results for abnormal trading volume are similar to initial results, the effect on PEAD is weaker and the effect on abnormal returns is insignificant. Taken together, these results indicate an importance to the earnings season itself. That is, investor response to a firm's actual earlier reporting peers relative to pseudo peers is similar due to an overlap in the dates of these earnings releases and the specific use of calendar year-end firms in my sample. As a result, future analyses should consider a division of macroeconomic information and industry-specific information provided by earlier reporting firms.

(Table 13)

VIII. Conclusion

Passive investment through index mutual funds and ETFs continues to increase over time. As a result, how a greater proportion of shares held passively impact the stock price efficiency of a firm should be of interest to all market participants. By using a firm's earnings season, when

news about firm performance is revealed by the firm itself and related industry peers, I examine how investor response, trading activity, and PEAD is affected by a firm's index fund ownership. Use of a firm's earnings announcement allows for assessment of how index fund ownership affects the efficiency with which a firm's stock price reflects disclosed earnings news. Use of information transfer allows for assessment of how index fund ownership affects the efficiency with which a firm's stock price reflects inferred earnings news from peer disclosures.

I find evidence of a decrease in investor disagreement surrounding a firm's earnings announcement, as its stock price efficiency experiences a benefit with relatively higher index fund ownership. Yet, these results are only present for firms with weaker information environments. That is, when the remaining active investors hold a stronger informational advantage over the marginal index investor, there is a decrease in investor disagreement on the news provided. I also find evidence that the associated decrease to investor participation from index fund ownership adversely affects the firm's stock price efficiency in reflecting firm information derived from peer earnings announcements (i.e., information transfer). That is, if the source of firm information is contingent on investor expectations, then decreased activity delays when this information is reflected in a firm's stock price.

Due to the competing factors of relative investor sophistication and decreased investor participation, I provide no conclusive evidence on the effect of index fund ownership on a firm's price efficiency. While prior theoretical and empirical research argue and find that passive investment increases price efficiency (Glosten et al. 2021, Bond and García 2022), decreases price efficiency (Israeli et al. 2017, Baruch and Zhang 2021), or has a null effect (Coles et al. 2022), I provide contextualized results which isolate the complexities of these associations. As total passive

investment increases, these relationships should continue to be explored given the complexity surrounding the interrelated effects of a firm's investor composition and its price efficiency.

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Appendix A: Variable Definitions

Dependent Variables

ARET	3-day cumulative abnormal return for firm during earnings announcement
ABVOL	Average volume from days t-1 to t+1 for firm earnings announcements, scaled by average volume during days t-20 to t-11 before the first peer firm's earnings announcement and days t+71 to t+80 after a firm's earnings announcement. Volume is calculated as daily trading volume, divided by common shares outstanding.
PEAD	Cumulative abnormal return for firm from days t+2 to t+60 from firm earnings announcement date.
RESP	Average 3-day cumulative abnormal return for firm during earnings announcements of industry peers reporting 5 days (or more) earlier in the earnings season
RESP_ABVOL	Average volume for firm during earnings announcements of industry peers reporting 5 days (or more) earlier in the earnings season, scaled by average volume during days t-20 to t-11 before the first peer firm's earnings announcement and days t+71 to t+80 after a firm's earnings announcement. Volume is calculated as daily trading volume, divided by common shares outstanding.

Variables of Interest

Index %	Total shares held by index funds, divided by total shares outstanding
RSUE	Median earnings surprise, scaled by stock price at end of quarter (I/B/E/S) and decile ranked by quarter
RESP	Average 3-day cumulative abnormal return for firm during earnings announcements of industry peers reporting 5 days (or more) earlier in the earnings season
EARLYPRARET	Average 3-day cumulative abnormal return for industry-peer firms with earnings announcements 5 days (or more) earlier than the firm

News-Related Controls

Loss	Indicator variable equal to 1 if firm reported negative net income in the quarter, zero otherwise
Accruals	Total accruals, scaled by total assets
$ARET_{t-1}$	3-day cumulative abnormal return for firm in prior quarter
$ARET_{t-4}$	3-day cumulative abnormal return for firm in prior year quarter
$RSUE_{t-1}$	Median earnings surprise, scaled by stock price at end of quarter (I/B/E/S) and decile ranked by quarter for firm in prior quarter

Investor Environment Controls	
Non-Index Inst. Own.	Difference between shares owned by all institutional shareholders and index funds
BA_Spread	Average bid-ask spread for the quarter ended. Bid-ask spread is calculated as the daily high ask price less the daily low bid price, scaled by daily stock price.
Amihud	Average Amihud score for the quarter ended. Amihud score is calculated as daily absolute return, divided by daily price multiplied by daily volume.
Firm Fundamental Controls	
Size	Natural log of market value of equity
Log_BTM	Natural log of firm book-to-market ratio
Momentum	Cumulative firm return over the 6 months prior to quarter-end
Analyst	Natural log of 1 + number of analysts estimates for current quarter earnings
Earnings Season Controls	
Early Peer Index %	Median index fund ownership of industry-peer firms with earnings announcements 5 days (or more) earlier than the firm
Early Industry %	Cumulative market value of all industry peer firms at observation date, scaled by total industry-quarter market value
Firm Importance	Market value of firm, scaled by total industry-quarter market value
Pre-Season Length	Total number of days between first industry peer earnings announcement date and firm earnings announcement date

Table 1: Sample Selection

	Sample
Compustat/CRSP/IBES/Thomson Reuters 2010-2019	69,214
Less: "Misc." industry classification	< 9,134 >
Less: Missing key variables	< 7,635 >
Less: Insufficient industry-quarter pairings	< 3,107 >
Final sample for main analyses	49,338

This table provides details on the sample employed in tests of the hypotheses. Compustat, CRSP, IBES, and Thomson Reuters provide firm fundamental, returns, analyst, and institutional ownership information, respectively. Observations classified into the Miscellaneous industry and missing key variables are dropped. Industry-quarters with less than 10 observations are also dropped.

Table 2: Descriptive Statistics

	N	Mean	SD	p25	p50	p75
ARET	49,338	0.003	0.076	-0.034	0.003	0.040
ABVOL	49,338	0.393	0.554	0.080	0.394	0.714
PEAD	49,338	0.035	0.187	-0.065	0.031	0.131
Index %	49,338	0.107	0.062	0.062	0.100	0.142
RSUE	49,338	4.512	2.648	2.000	5.000	7.000
RESP	49,338	0.000	0.020	-0.011	0.000	0.011
Loss	49,338	0.231	0.422	-	-	-
Accruals	49,338	0.024	0.032	0.005	0.014	0.030
$ARET_{t-1}$	49,338	0.003	0.075	-0.034	0.003	0.040
$ARET_{t-4}$	49,338	0.003	0.077	-0.035	0.002	0.041
Non-Index Inst. Own.	49,338	0.583	0.206	0.450	0.627	0.743
BA_Spread	49,338	0.031	0.015	0.021	0.027	0.038
Amihud	49,338	-0.000	0.000	0.000	0.000	0.000
Size	49,338	7.140	1.828	5.818	7.041	8.341
Log_BTM	49,338	-0.791	0.831	-1.250	-0.665	-0.223
Momentum	49,338	0.078	0.257	-0.058	0.074	0.210
Analyst	49,338	1.975	0.732	1.386	1.946	2.565
EARLYPRARET	49,338	0.004	0.024	-0.008	0.004	0.016
Early Peer Index %	49,338	0.110	0.041	0.082	0.105	0.138
Early Industry%	49,338	0.781	0.235	0.668	0.873	0.964
Firm Importance	49,338	0.016	0.041	0.000	0.002	0.012
Pre-Season Length	49,338	12.805	6.843	8.000	11.000	16.000
RESP_ABVOL	47,113	-0.096	0.353	-0.288	-0.091	0.099

This table presents descriptive statistics for the sample employed in tests of the hypotheses and additional analyses. See Appendix A for variable definitions.

Table 3: Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) ARET	1.00										
(2) ABVOL	-0.01*	1.00									
(3) PEAD	0.01*	0.02*	1.00								
(4) Index %	0.01*	0.10*	0.03*	1.00							
(5) RSUE	0.34*	0.02*	0.03*	0.02*	1.00						
(6) RESP	-0.01*	0.01*	0.02*	0.03*	0.04*	1.00					
(7) Loss	-0.11*	-0.03*	0.00	-0.16*	-0.15*	-0.03*	1.00				
(8) Accruals	0.00	0.06*	0.02*	-0.10*	-0.03*	0.00	0.28*	1.00			
(9) ARETt-1	0.01	0.02*	0.01	0.00	0.06*	-0.01*	-0.08*	-0.02*	1.00		
(10) ARETt-4	0.00	0.03*	-0.02*	0.01	0.02*	0.02*	-0.07*	-0.01*	0.01*	1.00	
(11) Non-Index Inst. Own.	0.02*	0.20*	0.00	0.34*	0.03*	0.02*	-0.13*	-0.03*	0.03*	0.05*	1.00
(12) BA_Spread	-0.02*	-0.07*	0.01*	-0.30*	0.00	-0.02*	0.48*	0.30*	-0.04*	-0.04*	-0.25*
(13) Amihud	-0.01	0.03*	-0.01*	0.04*	0.00	0.00	0.01*	0.02*	0.00	-0.01	0.07*
(14) Size	0.00	0.13*	-0.01	0.41*	0.02*	0.04*	-0.30*	-0.17*	0.04*	0.04*	0.46*
(15) Log_BTM	0.00	-0.12*	-0.04*	-0.08*	0.03*	-0.02*	-0.07*	-0.19*	-0.07*	-0.06*	-0.16*
(16) Momentum	0.01	0.01*	0.00	-0.03*	0.04*	0.01	-0.08*	-0.02*	0.28*	0.01*	0.05*
(17) Analyst	0.00	0.20*	-0.01	0.27*	0.03*	0.02*	-0.15*	-0.07*	0.00	0.02*	0.50*
(18) EARLYPRARET	0.00	0.01	0.02*	0.01*	0.01*	0.18*	-0.01	0.01*	-0.01	0.02*	0.00
(19) Early Peer Index %	0.01*	0.07*	0.06*	0.43*	0.01	0.03*	0.08*	0.07*	0.01*	0.00	0.08*
(20) Early Industry%	-0.02*	-0.07*	0.00	-0.15*	-0.04*	-0.02*	0.20*	0.10*	-0.02*	-0.02*	-0.18*
(21) Firm Importance	-0.01	0.06*	-0.01*	0.05*	0.01	0.01	-0.13*	-0.05*	0.01	0.01*	0.13*
(22) Pre-Season Length	-0.02*	-0.04*	0.02*	-0.19*	-0.05*	0.00	0.25*	0.20*	-0.03*	-0.01*	-0.18*
(23) RESP_ABVOL	0.00	0.43*	-0.01*	0.04*	0.00	0.04*	-0.06*	-0.05*	0.01	0.01*	0.05*

All correlations with a * are statistically significant difference from zero at the 5% level. See Appendix A for variable definitions.

Table 3 (continued): Correlation Matrix

Variables	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
(12) BA_Spread	1.00											
(13) Amihud	0.08*	1.00										
(14) Size	-0.54*	0.06*	1.00									
(15) Log_BTM	0.00	-0.05*	-0.28*	1.00								
(16) Momentum	-0.11*	0.00	0.09*	-0.23*	1.00							
(17) Analyst	-0.28*	0.06*	0.75*	-0.23*	0.00	1.00						
(18) EARLYPRARET	-0.02*	0.00	0.00	-0.02*	0.00	0.00	1.00					
(19) Early Peer Index %	0.00	0.03*	0.16*	-0.18*	-0.05*	0.03*	0.03*	1.00				
(20) Early Industry%	0.26*	0.00	-0.35*	0.02*	-0.03*	-0.27*	0.00	-0.01*	1.00			
(21) Firm Importance	-0.23*	0.01*	0.52*	-0.17*	0.01*	0.36*	-0.01*	0.10*	-0.17*	1.00		
(22) Pre-Season Length	0.32*	-0.01	-0.33*	0.02*	-0.05*	-0.27*	0.03*	0.03*	0.54*	-0.21*	1.00	
(23) RESP_ABVOL	-0.13*	-0.01*	0.11*	-0.02*	-0.01	0.11*	-0.01*	-0.04*	-0.07*	0.06*	-0.07*	1.00

All correlations with a * are statistically significant difference from zero at the 5% level. See Appendix A for variable definitions.

Table 4: Index Fund Ownership and Firm Earnings Information

	(1)		(2)		(3)		(4)		(5)		(6)	
	$ARET_{-1,1}$		$ARET_{-1,1}$		$ABVOL_{-1,1}$		$ABVOL_{-1,1}$		$PEAD_{2,60}$		$PEAD_{2,60}$	
RSUE/|RSUE|	0.010	***	0.008	***	0.024	***	0.032	***	0.002	***	0.005	***
	(50.050)		(23.615)		(17.717)		(11.565)		(4.756)		(6.074)	
Index %			-0.104	***			0.732	***			0.266	***
			(-7.126)				(7.416)				(8.152)	
Index Fund %			**0.023**	*******			**-0.079**	*******			**-0.030**	*******
x RSUE/|RSUE|			**(8.085)**				**(-3.622)**				**(-4.911)**	
$RSUE_{t-1}/\|RSUE\|_{t-1}$	-0.002	***	-0.002	***	0.002		0.002		0.001	*	0.001	
	(-13.996)		(-14.082)		(1.250)		(1.506)		(1.650)		(1.529)	
Loss	-0.015	***	-0.015	***	-0.049	***	-0.050	***	-0.008	***	-0.008	***
	(-13.473)		(-13.663)		(-5.296)		(-5.441)		(-2.702)		(-2.673)	
Accruals	0.054	***	0.052	***	0.577	***	0.585	***	0.082	**	0.089	**
	(3.696)		(3.566)		(4.919)		(4.974)		(2.008)		(2.181)	
$ARET_{t-1}$	0.008		0.008		0.120	***	0.118	***	0.003		0.004	
	(1.223)		(1.198)		(3.368)		(3.325)		(0.226)		(0.269)	
$ARET_{t-4}$	-0.015	***	-0.015	***	0.154	***	0.162	***	-0.049	***	-0.046	***
	(-2.873)		(-2.934)		(4.787)		(5.019)		(-3.761)		(-3.574)	
Non-Index Inst. Own.	0.006	***	0.006	***	0.242	***	0.224	***	-0.005		-0.013	**
	(3.180)		(3.091)		(9.271)		(8.338)		(-0.791)		(-2.230)	
BA_Spread	-0.013		-0.011		-3.370	***	-3.277	***	0.059		0.107	
	(-0.348)		(-0.300)		(-9.060)		(-8.828)		(0.531)		(0.964)	
Amihud	-1.942		-2.063		36.229		33.794		-10.263	**	-10.934	**
	(-1.323)		(-1.444)		(1.326)		(1.196)		(-1.993)		(-2.150)	
Size	-0.001	***	-0.001	***	-0.018	***	-0.023	***	-0.000		-0.002	*
	(-3.221)		(-3.290)		(-4.260)		(-5.270)		(-0.269)		(-1.740)	

Log_BTM	-0.002	***	-0.002	***	-0.031	***	-0.031	***	-0.007	***	-0.007	***
	(-2.753)		(-2.733)		(-5.088)		(-5.045)		(-4.266)		(-4.196)	
Momentum	-0.002		-0.002		-0.011		-0.003		-0.011	**	-0.009	
	(-1.402)		(-1.361)		(-0.930)		(-0.225)		(-2.120)		(-1.627)	
Analyst	-0.001		-0.001		0.146	***	0.150	***	-0.001		-0.000	
	(-1.345)		(-1.086)		(17.009)		(17.514)		(-0.633)		(-0.158)	
Fixed Effects	Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.	
R^2	0.128		0.131		0.128		0.130		0.010		0.012	
Observations	49,338		49,338		49,338		49,338		49,338		49,338	

This table presents tests of investor behavior surrounding a firm's earnings announcement date. Absolute values of a firm's unexpected earnings are used in the decile ranking by quarter in tests of abnormal volume (|*RSUE*|). Columns 1 and 2 test the abnormal return in the days surrounding a firm's earnings announcement date. Columns 3 and 4 test abnormal trading volume in the same period. Columns 5 and 6 test a firm's post-earnings announcement drift. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. See Appendix A for variable definitions.

Table 5: Index Fund Ownership and Industry Information Transfer

	(1) RESP		(2) RESP		(3) RESP_ABVOL		(4) RESP_ABVOL	
EARLYPRARET/|EARLYPRARET|	0.146	***	0.168	***	0.491	***	0.810	***
	(28.126)		(14.616)		(5.118)		(3.984)	
Index Fund %			0.002				0.135	*
			(1.115)				(1.774)	
Index Fund %			**-0.183**	****			**-2.730**	****
x EARLYPRARET/|EARLYPRARET|			**(-2.169)**				**(-1.986)**	
Early Peer Index Fund %	0.007	**	0.007	**	-0.364	***	-0.361	***
	(2.534)		(2.021)		(-7.430)		(-6.048)	
Early Industry %	-0.001	**	-0.001	**	-0.081	***	-0.081	***
	(-2.019)		(-2.001)		(-7.210)		(-7.194)	
Firm Importance	-0.012	***	-0.012	***	0.052		0.056	
	(-4.433)		(-4.133)		(0.926)		(0.994)	
Pre-Season Length	0.000		0.000		0.002	***	0.001	***
	(1.128)		(1.135)		(3.313)		(3.203)	
$RSUE_{t-1}/\|RSUE\|_{t-1}$	0.000		0.000		0.002	**	0.002	**
	(1.149)		(1.149)		(2.107)		(2.148)	
Non-Index Inst. Own.	-0.001		-0.001		-0.015		-0.013	
	(-1.217)		(-1.378)		(-1.175)		(-1.009)	
BA_Spread	0.005		0.005		-2.485	***	-2.521	***
	(0.408)		(0.482)		(-12.491)		(-12.628)	
Amihud	-0.497		-0.503		-14.423		-14.678	
	(-1.059)		(-1.078)		(-1.181)		(-1.203)	
Size	0.001	***	0.001	***	0.002		0.002	
	(6.458)		(6.198)		(0.693)		(0.631)	
Log_BTM	-0.000		-0.000		-0.011	***	-0.011	***
	(-0.414)		(-0.447)		(-3.853)		(-3.835)	

Momentum	0.000		0.000		-0.026	***	-0.026	***
	(0.094)		(0.108)		(-3.667)		(-3.633)	
Analyst	-0.001	***	-0.001	***	0.036	***	0.036	***
	(-2.866)		(-2.862)		(8.055)		(8.001)	
Fixed Effects	Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.	
R^2	0.036		0.036		0.035		0.035	
Observations	49,338		49,338		47,113		47,113	

This table presents tests of a firm's pre-earnings announcement information transfer absent, and in the presence of, index fund ownership. Columns 1 and 2 test the average investor abnormal return associated with average peer firm abnormal returns at their earnings announcement dates. Columns 3 and 4 test the average abnormal volume associated with the average absolute valued peer firm abnormal returns at their earnings announcement dates. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. See Appendix A for variable definitions.

Table 6: Index Fund Ownership and the Incorporation of Information Transfer

	(1)		(2)		(3)		(4)		(5)		(6)	
	$ARET_{-1,1}$		$ARET_{-1,1}$		$ABVOL_{-1,1}$		$ABVOL_{-1,1}$		$PEAD_{2,60}$		$PEAD_{2,60}$	
RESP	-0.098	***	-0.149	***	0.124		0.856	***	0.131	**	-0.060	
	(-5.072)		(-4.095)		(0.896)		(2.917)		(2.478)		(-0.551)	
Index Fund %			-0.015	**			0.361	***			0.041	**
			(-2.006)				(4.157)				(2.279)	
Index Fund %			**0.533**	*****			**-7.677**	*******			**2.000**	******
x RESP			**(1.690)**				**(-3.470)**				**(2.230)**	
RSUE/|RSUE|	0.010	***	0.010	***	0.024	***	0.024	***	0.002	***	0.002	***
	(50.154)		(50.155)		(18.042)		(18.146)		(4.294)		(4.280)	
$RSUE_{t-1}/\|RSUE\|_{t-1}$	-0.002	***	-0.002	***	0.002		0.002	*	0.001		0.001	
	(-14.069)		(-14.050)		(1.492)		(1.700)		(1.483)		(1.469)	
Loss	-0.015	***	-0.015	***	-0.046	***	-0.046	***	-0.010	***	-0.010	***
	(-13.593)		(-13.636)		(-5.031)		(-4.971)		(-3.648)		(-3.601)	
Accruals	0.056	***	0.056	***	0.578	***	0.582	***	0.083	**	0.084	**
	(3.779)		(3.762)		(4.938)		(4.926)		(2.048)		(2.070)	
EARLYPRARET	-0.009		-0.011		-0.078		-0.054		0.130	***	0.125	***
	(-0.663)		(-0.772)		(-0.884)		(-0.607)		(3.935)		(3.794)	
Early Peer Index Fund %	0.041	***	0.050	***	0.208	**	-0.026		0.329	***	0.300	***
	(4.240)		(4.617)		(2.455)		(-0.247)		(12.787)		(10.060)	
Early Industry %	-0.002		-0.002		-0.138	***	-0.138	***	-0.007		-0.007	
	(-0.889)		(-0.911)		(-7.456)		(-7.477)		(-1.294)		(-1.380)	
Firm Importance	-0.009		-0.014		-0.873	***	-0.761	***	0.010		0.024	
	(-1.099)		(-1.558)		(-7.323)		(-6.355)		(0.454)		(1.020)	
Pre-Season Length	-0.000		-0.000		0.002	***	0.002	***	0.000		0.000	
	(-0.469)		(-0.578)		(2.727)		(3.038)		(0.584)		(0.753)	
$ARET_{t-1}$	0.007		0.007		0.115	***	0.115	***	0.001		0.002	
	(1.061)		(1.061)		(3.256)		(3.254)		(0.059)		(0.129)	

$ARET_{t-4}$	-0.014	***	-0.015	***	0.149	***	0.154	***	-0.049	***	-0.048	***
	(-2.778)		(-2.805)		(4.631)		(4.774)		(-3.778)		(-3.703)	
Non-Index Inst. Own.	0.006	***	0.007	***	0.214	***	0.192	***	-0.000		-0.003	
	(3.099)		(3.463)		(8.202)		(7.120)		(-0.079)		(-0.487)	
BA_Spread	-0.011		-0.016		-3.270	***	-3.156	***	0.055		0.069	
	(-0.282)		(-0.421)		(-8.804)		(-8.471)		(0.496)		(0.625)	
Amihud	-2.087		-2.033		33.621		32.406		-10.917	**	-11.056	**
	(-1.419)		(-1.378)		(1.195)		(1.105)		(-2.108)		(-2.144)	
Size	-0.001	***	-0.001	***	-0.007		-0.011	**	-0.003	***	-0.003	***
	(-3.191)		(-2.751)		(-1.467)		(-2.232)		(-2.719)		(-3.090)	
Log_BTM	-0.001	**	-0.001	**	-0.029	***	-0.030	***	-0.005	***	-0.005	***
	(-2.343)		(-2.252)		(-4.736)		(-5.028)		(-3.148)		(-3.204)	
Momentum	-0.002		-0.002		-0.011		-0.007		-0.006		-0.005	
	(-1.040)		(-1.111)		(-0.916)		(-0.630)		(-1.122)		(-1.008)	
Analyst	-0.001		-0.001		0.145	***	0.145	***	0.003		0.003	
	(-0.884)		(-0.908)		(16.652)		(16.813)		(1.417)		(1.474)	
Fixed Effects	Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.	
R^2	0.129		0.130		0.132		0.133		0.015		0.015	
Observations	49,338		49,338		49,338		49,338		49,338		49,338	

This table presents tests of investor reaction to information transfer surrounding a firm's earnings announcement date absent, and in the presence of, index fund ownership. Absolute values of a firm's unexpected earnings are used in the decile ranking by quarter in tests of abnormal volume (|*RSUE*|). Columns 1 and 2 test the abnormal return associated with a firm's pre-earnings announcement information transfer. Columns 3 and 4 test the abnormal volume associated with a firm's pre-earnings announcement information transfer. Columns 5 and 6 test the post-earnings announcement drift associated with a firm's pre-earnings announcement information transfer. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. See Appendix A for variable definitions.

Table 7 Panel A: Index Fund Ownership and Firm Earnings, Size Split Sample

	Smaller Firms	**Larger Firms**	**Smaller Firms**	**Larger Firms**	**Smaller Firms**	**Larger Firms**
	(1)	(2)	(3)	(4)	(5)	(6)
	$ARET_{-1,1}$	$ARET_{-1,1}$	$ABVOL_{-1,1}$	$ABVOL_{-1,1}$	$PEAD_{2,60}$	$PEAD_{2,60}$
RSUE/|RSUE|	0.007 ***	0.009 ***	0.040 ***	0.016 ***	0.005 ***	0.001
	(18.616)	(15.929)	(11.125)	(4.300)	(5.873)	(0.838)
Index %	-0.164 ***	-0.030	0.807 ***	0.241 **	0.238 ***	0.240 ***
	(-7.664)	(-1.465)	(4.760)	(2.198)	(4.962)	(5.610)
Index Fund %	**0.036 *** **	**0.005**	**-0.110 *** **	**0.003**	**-0.031 *** **	**-0.011**
x RSUE/|RSUE|	**(9.085)**	**(1.151)**	**(-3.575)**	**(0.119)**	**(-3.628)**	**(-1.408)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.
R^2	0.146	0.114	0.113	0.140	0.013	0.023
Observations	24,676	24,662	24,676	24,662	24,676	24,662
Smaller - Larger Firms		**0.031 *** **		**-0.113 *** **		**-0.020 ***
(P-value)		**(0.000)**		**(0.005)**		**(0.096)**

This table presents split-sample tests of abnormal returns, abnormal volume, and post-earnings announcement drift surrounding a firm's earnings announcement date in the presence of index fund ownership. Columns 1 and 2 use subsamples for within-quarter median size to test a firm's earnings response coefficient. Columns 3 and 4 use subsamples for within-quarter median size to test abnormal volume. Columns 5 and 6 use subsamples for within-quarter median size to test the post-earnings announcement drift. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. Differences in the slope coefficient for the relevant interaction terms are presented in Columns 2, 4, and 6, along with the p-values for Wald tests of coefficient equality. See Appendix A for variable definitions.

Table 7 Panel B: Index Fund Ownership and Firm Earnings, Analyst Following Split Sample

	Fewer Analysts (1)		**Greater Analysts** (2)		**Fewer Analysts** (3)		**Greater Analysts** (4)		**Fewer Analysts** (5)		**Greater Analysts** (6)	
	$ARET_{-1,1}$		$ARET_{-1,1}$		$ABVOL_{-1,1}$		$ABVOL_{-1,1}$		$PEAD_{2,60}$		$PEAD_{2,60}$	
RSUE/|RSUE|	0.007	***	0.010	***	0.038	***	0.012	***	0.005	***	0.001	
	(19.199)		(15.186)		(10.733)		(3.052)		(6.247)		(0.377)	
Index %	-0.127	***	-0.032		0.750	***	0.065		0.262	***	0.273	***
	(-6.592)		(-1.340)		(4.941)		(0.530)		(6.090)		(4.802)	
Index Fund %	**0.029**	*******	**0.007**		**-0.100**	*******	**0.030**		**-0.034**	*******	**-0.007**	
x RSUE/|RSUE|	**(7.943)**		**(1.389)**		**(-3.421)**		**(1.092)**		**(-4.500)**		**(-0.629)**	
Controls	Yes		Yes		Yes		Yes		Yes		Yes	
Fixed Effects	Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.	
R^2	0.144		0.117		0.097		0.118		0.015		0.020	
Observations	26,145		23,193		26,145		23,193		26,145		23,193	
Fewer – Greater Analysts			**0.022**	*******			**-0.130**	*******			**-0.027**	*
(P-value)			**(0.000)**				**(0.001)**				**(0.051)**	

This table presents split-sample tests of abnormal returns, abnormal volume, and post-earnings announcement drift surrounding a firm's earnings announcement date in the presence of index fund ownership. Columns 1 and 2 use subsamples for within-quarter median analyst following to test a firm's earnings response coefficient. Columns 3 and 4 use subsamples for within-quarter median analyst following to test abnormal volume. Columns 5 and 6 use subsamples for within-quarter median analyst following to test the post-earnings announcement drift. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. Differences in the slope coefficient for the relevant interaction terms are presented in Columns 2, 4, and 6, along with the p-values for Wald tests of coefficient equality. See Appendix A for variable definitions.

Table 8 Panel A: Index Fund Ownership and the Incorporation of Information Transfer, Size Split Sample

	Smaller Firms	**Larger Firms**	**Smaller Firms**	**Larger Firms**	**Smaller Firms**	**Larger Firms**
	(1)	(2)	(3)	(4)	(5)	(6)
	$ARET_{-1,1}$	$ARET_{-1,1}$	$ABVOL_{-1,1}$	$ABVOL_{-1,1}$	$PEAD_{2,60}$	$PEAD_{2,60}$
RESP	-0.011	-0.025 ***	0.275 **	0.102	-0.005	0.109 ***
	(-0.945)	(-2.591)	(1.978)	(1.008)	(-0.165)	(4.944)
Index Fund %	-0.195 ***	-0.033	1.035 ***	-0.144	-0.018	-0.158
	(-4.358)	(-0.557)	(2.833)	(-0.357)	(-0.134)	(-1.051)
Index Fund %	**0.891 ** **	**-0.284**	**-6.255 ** **	**-3.365**	**0.979**	**3.313 *** **
x RESP	**(1.963)**	**(-0.640)**	**(-2.080)**	**(-1.129)**	**(0.753)**	**(2.877)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.
R^2	0.141	0.115	0.115	0.151	0.015	0.027
Observations	24,676	24,662	24,676	24,662	24,676	24,662
Smaller - Larger Firms		**1.175 ***		**-2.890**		**-2.334**
(P-value)		**(0.064)**		**(0.497)**		**(0.179)**

This table presents split-sample tests of abnormal returns, abnormal volume, and post-earnings announcement drift surrounding a firm's earnings announcement, considering the interrelated effects of index fund ownership and industry information transfer. Columns 1 and 2 use subsamples for within-quarter median size to test a firm's earnings response coefficient. Columns 3 and 4 use subsamples for within-quarter median size to test abnormal volume. Columns 5 and 6 use subsamples for within-quarter median size to test the post-earnings announcement drift. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. Differences in the slope coefficient for the relevant interaction terms are presented in Columns 2, 4, and 6, along with the p-values for Wald tests of coefficient equality. See Appendix A for variable definitions.

Table 8 Panel B: Index Fund Ownership and the Incorporation of Information Transfer, Analyst Following Split Sample

	Fewer Analysts (1)	**Greater Analysts** (2)	**Fewer Analysts** (3)	**Greater Analysts** (4)	**Fewer Analysts** (5)	**Greater Analysts** (6)
	$ARET_{-1,1}$	$ARET_{-1,1}$	$ABVOL_{-1,1}$	$ABVOL_{-1,1}$	$PEAD_{2,60}$	$PEAD_{2,60}$
RESP	-0.006	-0.025 **	0.379 ***	-0.013	0.005	0.178 ***
	(-0.557)	(-2.162)	(2.690)	(-0.120)	(0.198)	(6.194)
Index Fund %	-0.175 ***	-0.083	1.079 ***	0.006	-0.104	0.059
	(-4.075)	(-1.247)	(2.866)	(0.017)	(-0.764)	(0.368)
Index Fund %	**0.825 ** **	**-0.009**	**-5.830 ***	**-4.953 ***	**1.731**	**1.552**
x RESP	**(2.035)**	**(-0.018)**	**(-1.899)**	**(-1.746)**	**(1.460)**	**(1.162)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.	Ind., Qtr.
R^2	0.141	0.118	0.099	0.126	0.017	0.022
Observations	26,145	23,193	26,145	23,193	26,145	23,193
Fewer - Greater Analysts		**-0.026**		**-0.337**		**0.220**
(P-value)		**(0.187)**		**(0.833)**		**(0.919)**

This table presents split-sample tests of abnormal returns, abnormal volume, and post-earnings announcement drift surrounding a firm's earnings announcement, considering the interrelated effects of index fund ownership and industry information transfer. Columns 1 and 2 use subsamples for within-quarter median analyst following to test a firm's earnings response coefficient. Columns 3 and 4 use subsamples for within-quarter median analyst following to test abnormal volume. Columns 5 and 6 use subsamples for within-quarter median analyst following to test the post-earnings announcement drift. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. Differences in the slope coefficient for the relevant interaction terms are presented in Columns 2, 4, and 6, along with the p-values for Wald tests of coefficient equality. See Appendix A for variable definitions.

Table 9: Incremental Index Fund Ownership and Firm Earnings Information

	(1)		(2)		(3)	
	$ARET_{-1,1}$		$ABVOL_{-1,1}$		$PEAD_{2,60}$	
RSUE/|RSUE|	0.0078	***	0.0293	***	0.0052	***
	(24.3746)		(8.8771)		(6.0771)	
Index 5%-10%	**0.0023**	*******	**-0.0031**		**-0.0039**	*******
x RSUE/|RSUE|	**(5.5757)**		**(-0.8113)**		**(-3.5219)**	
Index 10%-15%	**0.0027**	*******	**-0.0101**	******	**-0.0051**	*******
x RSUE/|RSUE|	**(6.1615)**		**(-2.5683)**		**(-4.6312)**	
Index 15%-20%	**0.0033**	*******	**-0.0061**		**-0.0066**	*******
x RSUE/|RSUE|	**(5.6442)**		**(-1.3857)**		**(-4.8925)**	
Index 20%-25%	**0.0053**	*******	**-0.0147**	*******	**-0.0060**	*******
x RSUE/|RSUE|	**(6.6479)**		**(-2.6446)**		**(-3.2824)**	
Index > 25%	**0.0047**	*******	**-0.0109**	*****	**-0.0037**	
x RSUE/|RSUE|	**(3.8522)**		**(-1.6777)**		**(-1.5807)**	
Controls	Yes		Yes		Yes	
Fixed Effects	Ind., Qtr.		Ind., Qtr.		Ind., Qtr.	
R^2	0.131		0.131		0.013	
Observations	49,338		49,338		49,338	

This table presents tests of investor response surrounding a firm's earnings announcement date with incremental levels of index fund ownership. Absolute values of a firm's unexpected earnings are used in the decile ranking by quarter in tests of abnormal volume (|*RSUE*|). Column 1 tests the abnormal return in the days surrounding a firm's earnings announcement date. Column 2 tests abnormal trading volume in the same period. Column 3 tests a firm's post-earnings announcement drift. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. See Appendix A for variable definitions.

Figure 1: Abnormal Return for Incremental Index Fund Ownership

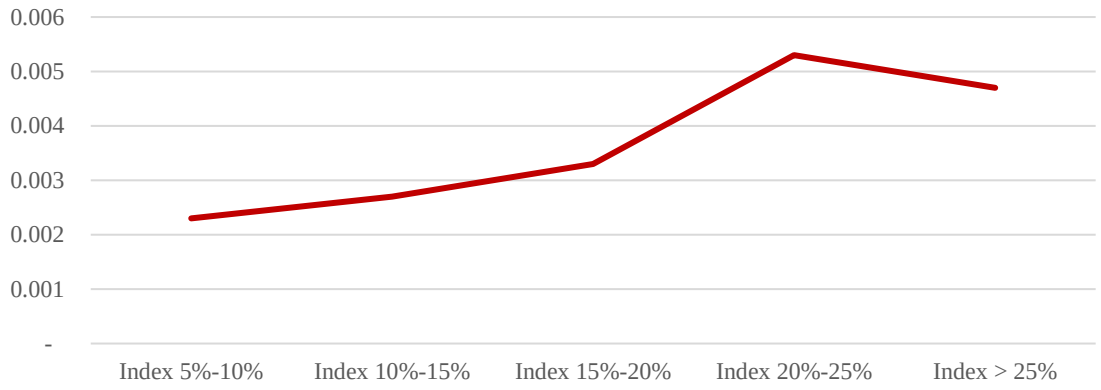

Figure 1 provides a linear representation of the results from Column 1 of Table 7. Each incremental bucket of index fund ownership represents the associated coefficient on the interaction term.

Figure 2: Abnormal Volume for Incremental Index Fund Ownership

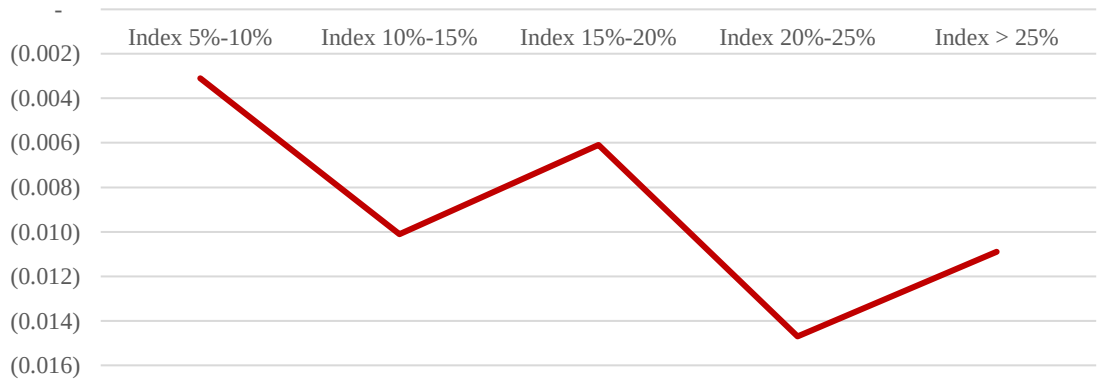

Figure 2 provides a linear representation of the results from Column 2 of Table 7. Each incremental bucket of index fund ownership represents the associated coefficient on the interaction term.

Figure 3: Post-Earnings Announcement Drift for Incremental Index Fund Ownership

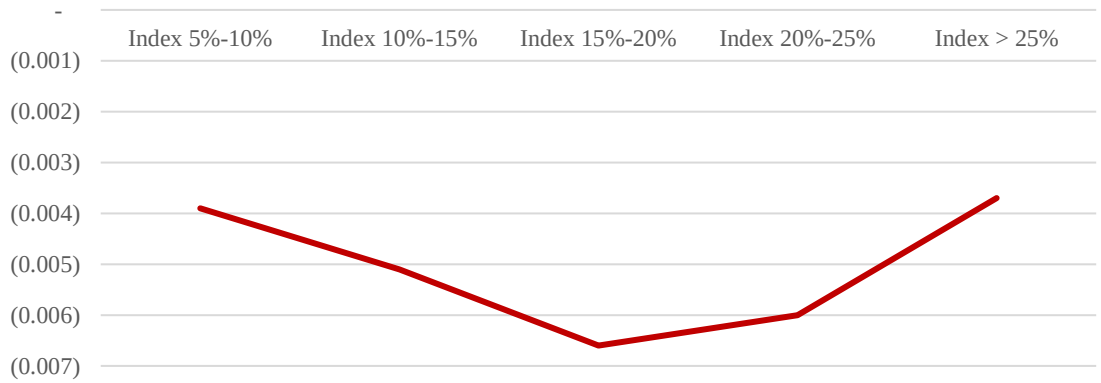

Figure 3 provides a linear representation of the results from Column 3 of Table 7. Each incremental bucket of index fund ownership represents the associated coefficient on the interaction term.

Table 10: Prior Period Index Fund Ownership and Firm Earnings Information

	(1)		(2)		(3)	
	$ARET_{-1,1}$		$ABVOL_{-1,1}$		$PEAD_{2,60}$	
$RSUE/\|RSUE\|_{t-1}$	-0.002	***	-0.002		0.001	*
	(-6.127)		(-0.672)		(1.769)	
Index $\%_{t-1}$	0.108	***	1.336	***	0.646	***
	(3.114)		(6.318)		(6.872)	
Index $\%_{t-1}$	**-0.007**	*******	**0.032**		**-0.008**	
x $RSUE/\|RSUE\|_{t-1}$	**(-2.892)**		**(1.621)**		**(-1.304)**	
Index %	-0.181	***	-0.658	***	-0.255	***
	(-5.270)		(-2.985)		(-2.752)	
RSUE/|RSUE|	0.007	***	0.029	***	0.005	***
	(22.321)		(10.459)		(6.130)	
Index Fund %	0.027	***	-0.062	***	-0.035	***
x RSUE/|RSUE|	(9.249)		(-2.878)		(-5.556)	
Loss	-0.015	***	-0.060	***	-0.003	
	(-13.306)		(-6.595)		(-1.052)	
Accruals	0.052	***	0.549	***	0.035	
	(3.918)		(5.006)		(0.858)	
$ARET_{t-1}$	0.007		0.081	**	0.003	
	(1.040)		(2.339)		(0.191)	
$ARET_{t-4}$	-0.017	***	0.109	***	-0.027	*
	(-3.118)		(3.294)		(-1.883)	
Non-Index Inst. Own.	0.005	**	0.207	***	-0.019	***
	(2.448)		(7.932)		(-3.025)	
BA_Spread	0.014		-3.821	***	0.485	***
	(0.399)		(-11.082)		(4.241)	
Amihud	-2.669	*	48.415	*	-10.343	**
	(-1.766)		(1.656)		(-1.977)	
Size	-0.001	***	-0.031	***	-0.002	**
	(-2.717)		(-7.102)		(-2.212)	
Log_BTM	-0.002	***	-0.043	***	-0.009	***
	(-3.366)		(-7.542)		(-5.423)	
Momentum	-0.000		-0.010		-0.004	
	(-0.244)		(-0.827)		(-0.714)	
Analyst	-0.001		0.166	***	0.003	
	(-1.092)		(19.384)		(1.093)	
Fixed Effects	Ind., Qtr.		Ind., Qtr.		Ind., Qtr.	

R^2	0.120	0.127	0.017
Observations	52,242	52,242	52,242

This table presents tests of investor behavior surrounding a firm's earnings announcement date using index fund ownership and earnings surprise from the previous quarter. Absolute values of a firm's unexpected earnings are used in the decile ranking by quarter in tests of abnormal volume (|*RSUE*|). Column 1 tests the abnormal return in the days surrounding a firm's earnings announcement date. Column 2 tests abnormal trading volume in the same period. Column 3 tests a firm's post-earnings announcement drift. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. See Appendix A for variable definitions.

Table 11: Index Fund Ownership and Firm Earnings Information, Time Trend Assessment

	(1)		(2)		(3)		(4)		(5)		(6)	
	$ARET_{-1,1}$		$ARET_{-1,1}$		$ABVOL_{-1,1}$		$ABVOL_{-1,1}$		$PEAD_{2,60}$		$PEAD_{2,60}$	
RSUE/|RSUE|	0.010	***	0.008	***	0.024	***	0.032	***	0.002	***	0.005	***
	(49.977)		(23.628)		(17.617)		(11.440)		(4.257)		(6.001)	
Index %			-0.121	***			0.664	***			0.120	***
			(-8.007)				(5.704)				(3.496)	
Index Fund %			**0.023**	***			**-0.076**	***			**-0.031**	***
x RSUE/|RSUE|			**(8.061)**				**(-3.535)**				**(-5.066)**	
$RSUE_{t-1}/\|RSUE\|_{t-1}$	-0.002	***	-0.002	***	0.001		0.002		0.001		0.001	
	(-14.045)		(-14.108)		(1.103)		(1.413)		(1.412)		(1.429)	
Loss	-0.015	***	-0.016	***	-0.054	***	-0.052	***	-0.012	***	-0.012	***
	(-13.765)		(-14.048)		(-5.771)		(-5.549)		(-4.378)		(-4.306)	
Accruals	0.054	***	0.052	***	0.578	***	0.584	***	0.081	**	0.083	**
	(3.690)		(3.518)		(4.958)		(4.981)		(1.997)		(2.051)	
$ARET_{t-1}$	0.007		0.007		0.111	***	0.115	***	-0.003		-0.003	
	(1.122)		(1.060)		(3.127)		(3.244)		(-0.211)		(-0.219)	
$ARET_{t-4}$	-0.015	***	-0.015	***	0.155	***	0.161	***	-0.048	***	-0.048	***
	(-2.855)		(-2.966)		(4.819)		(4.997)		(-3.702)		(-3.692)	
Non-Index Inst. Own.	0.007	***	0.008	***	0.248	***	0.229	***	0.001		0.003	
	(3.424)		(3.899)		(9.511)		(8.364)		(0.159)		(0.438)	
BA_Spread	-0.016		-0.022		-3.398	***	-3.306	***	0.028		0.016	
	(-0.428)		(-0.583)		(-9.136)		(-8.945)		(0.251)		(0.147)	
Amihud	-2.042		-2.078		34.974		33.689		-11.309	**	-11.069	**
	(-1.389)		(-1.451)		(1.278)		(1.200)		(-2.152)		(-2.119)	
Size	-0.002	***	-0.001	***	-0.023	***	-0.024	***	-0.004	***	-0.004	***
	(-4.182)		(-4.033)		(-5.107)		(-5.410)		(-4.283)		(-4.154)	

Log_BTM	-0.001	**	-0.001	**	-0.027	***	-0.029	***	-0.004	**	-0.004	**
	(-2.224)		(-2.114)		(-4.474)		(-4.737)		(-2.470)		(-2.402)	
Momentum	-0.002		-0.002		-0.001		-0.000		-0.002		-0.002	
	(-0.879)		(-0.912)		(-0.048)		(-0.003)		(-0.352)		(-0.364)	
Analyst	-0.000		-0.000		0.153	***	0.152	***	0.005	**	0.005	**
	(-0.508)		(-0.254)		(17.491)		(17.495)		(2.463)		(2.389)	
Trend	0.001	***	0.001	***	0.006	***	0.002		0.006	***	0.006	***
	(4.281)		(4.461)		(5.162)		(1.385)		(16.257)		(13.685)	
Fixed Effects	Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.	
R^2	0.129		0.131		0.129		0.130		0.017		0.018	
Observations	49,338		49,338		49,338		49,338		49,338		49,338	

This table presents tests of investor behavior surrounding a firm's earnings announcement date. Absolute values of a firm's unexpected earnings are used in the decile ranking by quarter in tests of abnormal volume (|*RSUE*|). Columns 1 and 2 test the abnormal return in the days surrounding a firm's earnings announcement date. Columns 3 and 4 test abnormal trading volume in the same period. Columns 5 and 6 test a firm's post-earnings announcement drift. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. See Appendix A for variable definitions.

Figure 4: Abnormal Return for Index Fund Ownership Time Trend

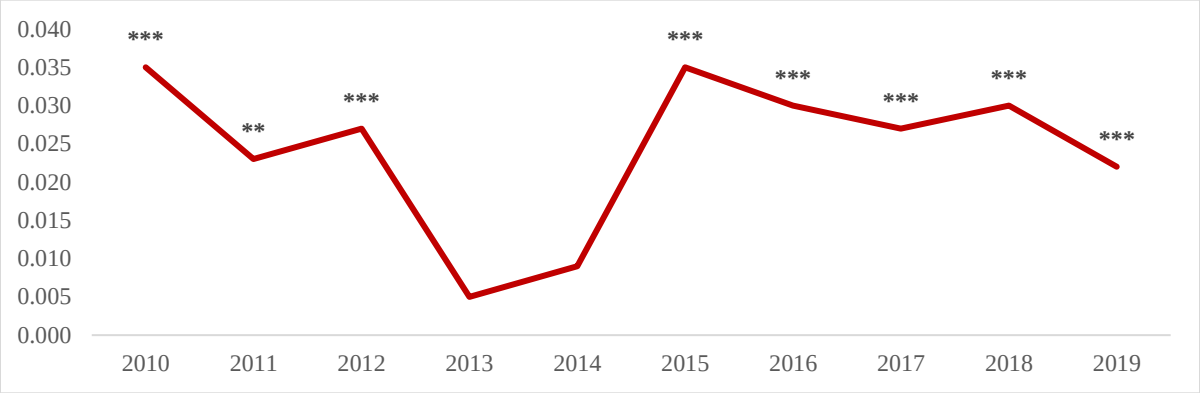

Figure 4 provides a linear representation of the results from annual tests of H1. Each year represents the associated coefficient on the interaction term. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively.

Figure 5: Abnormal Volume for Index Fund Ownership Time Trend

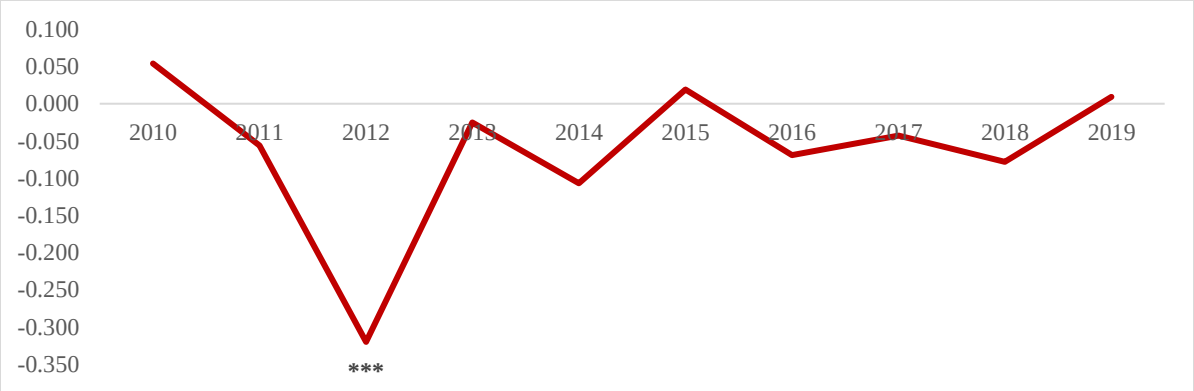

Figure 4 provides a linear representation of the results from annual tests of H1. Each year represents the associated coefficient on the interaction term. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively.

Figure 6: Post-Earnings Announcement Drift for Index Fund Ownership Time Trend

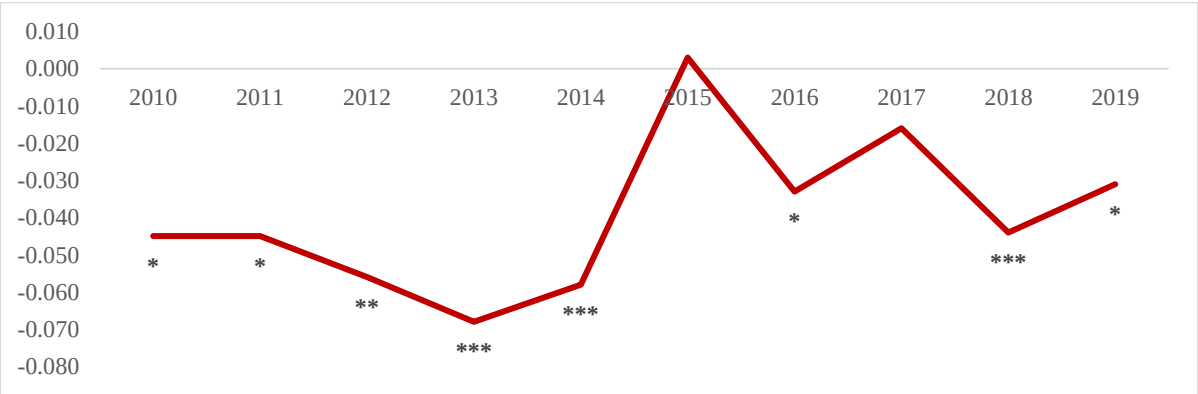

Figure 4 provides a linear representation of the results from annual tests of H1. Each year represents the associated coefficient on the interaction term. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively.

Table 12: Index Fund Ownership and Other Firm Information

	(1)		(2)	
	$ABS\_ARET_{-1,1}$		$ABVOL_{-1,1}$	
Index %	0.016	***	-0.358	***
	(4.953)		(-4.330)	
Accruals	0.031	***	0.073	
	(5.029)		(0.383)	
Non-Index Inst. Own.	-0.000		0.044	
	(-0.133)		(1.368)	
BA_Spread	0.616	***	0.090	
	(32.559)		(0.179)	
Amihud	-5.748	***	-75.060	*
	(-3.392)		(-1.838)	
Size	-0.003	***	-0.081	***
	(-13.728)		(-17.061)	
Log_BTM	-0.001	***	-0.054	***
	(-3.877)		(-7.079)	
Momentum	0.001		0.027	
	(1.068)		(1.380)	
Analyst	0.003	***	0.091	***
	(6.298)		(8.145)	
Fixed Effects	Ind., Qtr.		Ind., Qtr.	
R^2	0.117		0.020	
Observations	152,962		152,962	

This table presents tests of investor response to released firm 8-Ks. Column 1 tests the absolute abnormal return in the days surrounding a the 8-K release date. Column 2 tests abnormal trading volume in the same period. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. See Appendix A for variable definitions.

Table 13: Index Fund Ownership and the Incorporation of Pseudo-Industry Information Transfer

	(1)		(2)		(3)		(4)		(5)		(6)	
	$ARET_{-1,1}$		$ARET_{-1,1}$		$ABVOL_{-1,1}$		$ABVOL_{-1,1}$		$PEAD_{2,60}$		$PEAD_{2,60}$	
RESP	-0.103	***	-0.115	***	0.035		0.802	***	0.179	***	0.018	
	(-5.390)		(-3.137)		(0.260)		(2.753)		(3.254)		(0.163)	
Index Fund %			-0.012	*			0.466	***			0.020	
			(-1.720)				(5.517)				(1.119)	
Index Fund %			**0.124**				**-8.253**	*******			**1.713**	*****
x RESP			**(0.383)**				**(-3.599)**				**(1.866)**	
RSUE/|RSUE|	0.010	***	0.010	***	0.022	***	0.022	***	0.002	***	0.002	***
	(52.543)		(52.549)		(16.402)		(16.509)		(4.164)		(4.150)	
$RSUE_{t-1}/\|RSUE\|_{t-1}$	-0.002	***	-0.002	***	0.001		0.001		0.001		0.001	
	(-15.897)		(-15.880)		(0.490)		(0.592)		(1.265)		(1.267)	
Loss	-0.014	***	-0.014	***	-0.066	***	-0.064	***	-0.003		-0.003	
	(-13.141)		(-13.196)		(-6.942)		(-6.818)		(-1.201)		(-1.169)	
Accruals	0.046	***	0.046	***	0.830	***	0.827	***	0.015		0.015	
	(3.612)		(3.611)		(7.589)		(7.589)		(0.392)		(0.390)	
EARLYPRARET	-0.015		-0.015		0.380	***	0.375	***	0.133	***	0.132	***
	(-0.870)		(-0.861)		(3.067)		(3.030)		(2.858)		(2.833)	
Early Peer Index Fund %	0.044	***	0.051	***	0.115		-0.167		0.432	***	0.419	***
	(4.484)		(4.810)		(1.341)		(-1.639)		(16.253)		(14.119)	
Early Industry %	-0.001		-0.001		-0.074	***	-0.069	***	-0.012	***	-0.012	***
	(-0.675)		(-0.749)		(-4.814)		(-4.492)		(-2.686)		(-2.682)	
Firm Importance	-0.001		-0.004		-0.419	***	-0.301	***	0.011		0.016	
	(-0.160)		(-0.566)		(-5.392)		(-3.896)		(0.525)		(0.789)	
Pre-Season Length	0.000		0.000		0.004	***	0.004	***	0.001	**	0.001	**
	(0.046)		(0.019)		(5.639)		(5.707)		(2.290)		(2.351)	
$ARET_{t-1}$	0.013	**	0.013	**	0.085	**	0.085	**	0.010		0.010	
	(2.232)		(2.217)		(2.511)		(2.542)		(0.646)		(0.688)	

$ARET_{t-4}$	-0.013	***	-0.013	***	0.097	***	0.102	***	-0.037	***	-0.036	***
	(-2.632)		(-2.658)		(3.106)		(3.272)		(-2.818)		(-2.777)	
Non-Index Inst. Own.	0.005	***	0.006	***	0.353	***	0.324	***	-0.002		-0.003	
	(2.702)		(3.030)		(13.787)		(12.457)		(-0.321)		(-0.524)	
BA_Spread	-0.033		-0.037		-3.455	***	-3.321	***	0.219	**	0.229	**
	(-0.990)		(-1.106)		(-9.699)		(-9.302)		(2.081)		(2.176)	
Amihud	-1.302		-1.235		59.285	**	56.738	*	-13.587	**	-13.670	**
	(-0.824)		(-0.780)		(1.970)		(1.823)		(-2.535)		(-2.565)	
Size	-0.001	***	-0.001	***	-0.032	***	-0.038	***	-0.003	***	-0.003	***
	(-4.023)		(-3.494)		(-6.740)		(-7.980)		(-3.020)		(-3.222)	
Log_BTM	-0.002	***	-0.002	***	-0.076	***	-0.078	***	-0.011	***	-0.011	***
	(-3.294)		(-3.207)		(-14.041)		(-14.403)		(-7.737)		(-7.760)	
Momentum	0.001		0.000		-0.047	***	-0.042	***	-0.004		-0.004	
	(0.374)		(0.290)		(-4.099)		(-3.677)		(-0.854)		(-0.792)	
Analyst	-0.000		-0.000		0.159	***	0.162	***	0.002		0.002	
	(-0.083)		(-0.179)		(17.119)		(17.453)		(0.946)		(1.030)	
Fixed Effects	Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.		Ind., Qtr.	
R^2	0.121		0.122		0.084		0.086		0.015		0.015	
Observations	54,305		54,305		54,304		54,304		54,305		54,305	

This table presents tests of investor reaction to pseudo-industry information transfer surrounding a firm's earnings announcement date absent, and in the presence of, index fund ownership. Absolute values of a firm's unexpected earnings are used in the decile ranking by quarter in tests of abnormal volume (|*RSUE*|). Columns 1 and 2 test the abnormal return associated with a firm's pre-earnings announcement information transfer. Columns 3 and 4 test the abnormal volume associated with a firm's pre-earnings announcement information transfer. Columns 5 and 6 test the post-earnings announcement drift associated with a firm's pre-earnings announcement information transfer. Industry classifications are randomly assigned to create pseudo-industries. Standard errors are clustered by firm and t-statistics are reported in parentheses. *, **, and *** indicate a statistically significant difference from zero at the 10%, 5%, and 1% level, respectively. See Appendix A for variable definitions.