Is there a global upward trend in the information content of earnings announcements?

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Abstract

We find that the information content of earnings announcements has exhibited an increasing trend worldwide in the 21st century. This global rise in the information content of earnings announcements is primarily driven by post-announcement trading rather than pre-announcement trading. Managerial guidance and analyst forecasts that accompany earnings announcements, along with more detailed earnings reports, are crucial factors contributing to the upward trend in information content, accounting for 28% of its magnitude. Additionally, institutionalized investing explains some variations in the increasing trend of the information content of earnings announcements. Notably, countries that are more developed and have more stringent insider trading regulations prior to the sample period experience a greater increase in the information content of earnings announcements, suggesting that a convergence of information environments across countries is not a driver of our findings.

Keywords: information content, earnings announcements, time trend, international market; informativeness; return variance; trading volume.

JEL Codes: F30; G12; G14; M40; M41.

1. Introduction

Beaver et al. (2020) find that the information content of earnings announcements significantly increased in the U.S. stock market in the new century. They observe that abnormal return variance and trading volume surrounding earnings announcements have grown in recent years, which are two traditional metrics of information content dating back to Beaver (1968). In this study, we extend our analysis beyond the U.S. market to investigate whether there is a global upward trend in the information content of earnings announcements. In this international context, our research aims to provide new insights into the factors that influence the increasing significance of earnings announcements. Additionally, we address aspects that have been overlooked by Beaver et al. (2020), such as differentiating between pre-announcement and post-announcement trading, as well as the impact of institutional investing.

An upward trend in the information content of earnings announcements has implications for the information disclosures of firms. Beaver et al. (2020) attribute their finding of increasing information content of earnings announcements to the growing prevalence of concurrent information disclosures. These disclosures take the form of managerial earnings guidance and analyst earnings forecasts being published on the same day as earnings announcements, and the earnings report containing additional line items. Similarly, Shao et al. (2021) use earnings announcement returns as a measure of corporate fundamental news. They discover that earnings announcement returns account for a greater proportion of future stock returns in recent years, despite the fact that the announced earnings themselves become less value relevant over time. Therefore, both studies, Beaver et al. (2020) and Shao et al. (2021), suggest that firm managers have discretion over disclosing new information and such information goes beyond what is included in the latest earnings figure. Importantly, the quantity of such additional new information is increasing over time.

Following Beaver et al. (2020) and Landsman et al. (2012), we use two measures to assess the information content of earnings announcements. One measure is based on the variance of stock returns, while the other one is based on stock trading volumes. These measures aim to

capture the arrival of new information that leads to abnormal return variance and trading volumes around the earnings announcement date (day 0). The return variance-based measure (referred to as *AVAR*) is calculated as the average of squared daily residual returns from day -1 to day 1 during earnings announcements, divided by the variance of residual returns from day -120 to day -6 before the earnings announcement. The volume-based measure (referred to as *AVOL*) is determined by subtracting the average volume from day -120 to day -6 from the average daily volume from day -1 to day 1, and then dividing this difference by the standard deviation of daily volumes from day -120 to day -6.

Our sample of global firms comprise 58 countries or regions during 2000-2023. In this sample, we observe a significant upward trend in the information content of earnings announcements, as indicated by the abnormal return variance and abnormal trading volume around earnings announcements. According to the coefficient estimates for the models that utilize the complete set of primary control variables and country fixed effects, *AVAR* increases by 0.067 per year, with a t-value of 6.03, while *AVOL* increases by 0.018 per year, with a t-value of 5.29. The magnitude of the increase in *AVAR* is approximately 60% of that observed in the U.S. market, as reported by Beaver et al. (2020). We can also assess the significance of our findings from another perspective. Landsman et al. (2012) demonstrate that the adoption of International Financial Reporting Standards (IFRS) enhances the informational content of earnings announcements. According to our estimates, the annual rate of increase in *AVAR* is roughly 12% of the IFRS adoption effect, while the annual rate in *AVOL* is approximately 19% of the IFRS adoption effect. This suggests that the growth in informational content over 5 to 8 years is similar in magnitude to the effect of IFRS adoption (since 12%* 8≈1 and 19%*5≈1).

We then investigate whether the upward trend of earnings announcement informativeness is more about pre-announcement trading or post-announcement trading. Such an analysis was not conducted by Beaver et al. (2020) on the U.S. market. We compute measures of information content for pre-announcement and post-announcement windows and find that the increase in the information content of earnings announcements is driven by post-announcement trading.

Meanwhile, pre-announcement trading exhibits a decreasing trend over time. This suggests that more information is shifted to post-announcement periods instead of being incorporated into stock prices through trading before announcements. Consistent with Beaver et al.'s (2020) findings on the U.S. market, we find that the practice of concurrent information disclosures is becoming more prevalent: managerial earnings guidance and analyst earnings forecasts are published more frequently on the same day as earnings announcements, and the earnings report contains more line items over time. According to our estimates, concurrent information disclosures explain 28% of the magnitude of the upward trend in the information content of earnings announcements.

It is imperative for us to examine the extent to which the upward trend of the information content measures is actually explained by non-informational return noise (Thomas et al., 2022). Return noise, stemming from microstructure frictions and stock mispricing, is a component of both the denominator and numerator of the return variance-based measure $AVAR$. When return noise is exceptionally high, $AVAR$ approaches one. A reduction of return noise decreases both the denominator and numerator, resulting in an increase in $AVAR$. This impact of return noise on $AVAR$ is unrelated to new information. To mitigate this bias, Thomas et al. (2022) suggest using return volatility differences between announcements and non-announcement periods to gauge information content.

Return noise is proxied by the bid-ask spread of stocks according to Thomas et al.'s (2022). We do not have high-frequency trading data on global stocks. Therefore, we use the well-cited estimation method of Corwin and Schultz (2012), which relies on the low-frequency daily high and low stock prices as the inputs. With this bid-ask spread estimate, we demonstrate that return noise does not affect our findings. First, we find that controlling for it does not alter the estimation results. Second, the finding is stronger when priror bid-ask spreads are smaller, which contradicts the reasoning of Thomas et al. (2022). If a reduction of return noise is the main reason for the finding, the opposite should be observed. Third, the bid-ask spread is on average not declining among global stocks. Fourth, our finding is robust if we use the alternative information measure advocated by Thomas et al. (2022). Finally, the numerator of

AVAR shows an increasing trend, and the denominator of *AVAR* shows an decreasing trend. All these suggest that the change in the bid-ask spread has no significant role in our findings.

We then examine whether institutional ownership influences the increasing trend in the information content of earnings announcements. First of all, we find that institutional ownership itself exhibits a global upward trend. If institutional investors, on average, have a short-term focus and actively trade on earnings news, we expect the rise in institutional ownership to heighten the information content of earnings announcements (Hotchkiss and Strickland, 2003; Mian et al., 2011). Indeed, we find that the information content of earnings announcements increases at a faster rate for stocks with higher lagged institutional ownership. This observation holds true for both *AVAR* and *AVOL* when used as measures of the information content of earnings announcements.

Finally, we conduct country-level analyses to identify country-specific factors that may explain the variations in the time trend of the information content of earnings announcements across countries. Our findings indicate that the upward trend is significant in both developed and developing markets, with the magnitude of the positive change in developed markets being approximately twice as large as that in developing markets. Furthermore, markets that had more restrictive insider trading environments prior to the sample period experienced larger increases in *AVAR* and *AVOL*. Therefore, a global convergence of accounting or securities regulations, if it exists, does not account for our findings regarding the time trend in the information content of earnings announcements.

Our study is closely related to three strands of literature. First, we aim to establish the existence of an upward trend in the information content of earnings announcements, connecting our work to Beaver et al. (2020) and Thomas et al. (2022). Unlike Thomas et al. (2022), we do not observe a significant decline in return noise, as indicated by bid-ask spreads, for our sample of global stocks in recent years. Furthermore, we find no evidence that changes in return noise drive the increase in average volatility around earnings announcements. Our results suggest that the rising information content of earnings announcements is a phenomenon likely shared by many countries, including the United States.

Second, our study enhances our understanding of the factors that shape the increasing volume of information surrounding earnings announcements. On a global scale, we demonstrate a rising trend in managerial earnings guidance and analyst forecasts being issued on the same day as earnings announcements. Furthermore, we observe that the earnings reports of global firms have become more detailed over the years, incorporating a greater number of data items. Our findings indicate that concurrent disclosures enhance the informativeness of earnings announcements, which aligns with the conclusions of Collins et al. (2009) and Beaver et al. (2020) regarding the prevalence of concurrent information disclosures and their positive impact on the informational content of earnings announcements. In contrast, our study diverges from the findings of Arif et al. (2019), who report that simultaneous releases of 10-K filings diminish the informational content of earnings announcements. In addition to information disclosures, our research identifies the increasing prevalence of institutionalized investing over time as another contributing factor to the rising informational content of earnings announcements (Hotchkiss and Strickland, 2003; Mian et al., 2011).

Finally, our study is closely related to Shao et al. (2021) in suggesting that new information revealed through earnings announcements is increasingly beyond the earnings figure. We contend that any information not immediately disclosed constitutes a delay in information disclosures. In this sense, managerial earnings guidance concurrent with earnings announcements can be seen as delayed disclosures. Therefore, our study addresses the frequency of information disclosure (Fu et al., 2012) and the appropriate threshold for voluntary information disclosures (Heitzman et al., 2010). As demonstrated by Stoumbos (2023), information asymmetry generally increases between two earnings announcement dates and decreases immediately after a new earnings announcement. Our study uncovers a shift towards concentrated disclosures on the specific date of earnings announcements, likely intensifying variations in information asymmetry across days as mentioned earlier.

The remainder of the paper is structured as follows: Section 2 provides a review of pertinent research, Section 3 illustrates the research design, Section 4 describes the data and the sample, Section 5 presents empirical analyses, and Section 6 concludes.

2. Literature Review

2.1. Time trend in the information content of earnings announcements

This subsection provides a summary of recent studies on the information content of earnings announcements with a focus on the trend in the information content.[1] Beaver et al. (2020) find that abnormal return volatilities and trading volume at earnings announcements both increase dramatically in the U.S. market in the period of 2001-2016. Beaver et al. thus conclude that the information content of earnings announcements is increasing over time, attributing this increase to a greater amount of concurrent disclosures. Concurrent disclosures include managerial earnings guidance and analyst earnings forecasts published on the same day as earnings announcements, as well as a more detailed earnings report with additional line items. Similar to Beaver et al., Shao et al. (2021) use earnings announcement returns as a proxy of firm fundamental news and find that announcement returns have been better at explaining stock price movements over the years, even though the change in earnings itself explains less stock price movement over time. Both Shao et al. (2021) and Beaver et al. (2020) suggest that new information released at earnings announcements goes beyond the latest earnings figure, and the volume of such new information is increasing over time.

On the other hand, Thomas et al. (2022) raise the issue that the inference regarding the time trend in the information content of earnings announcements using abnormal return variance ($AVAR$) critically depends on whether return noise remains at the same level as before. If return noise is smaller, this not only makes the denominator of $AVAR$ smaller, but also the numerator of $AVAR$. As $AVAR$ is a ratio, the denominator will be lowered more than the numerator is lowered, resulting in a larger $AVAR$. Thomas et al. demonstrate that the decrease in return noise, as proxied by the bid-ask spread of stocks, can be as important as the arrival of new information in explaining the rise in $AVAR$. They show that there is no time trend in the aggregate information content as measured by the differences in return variance between

[1] Earlier studies investigating the time trend in earnings announcement informativeness include Landsman and Maydew (2002); Francis et al. (2002a, 2002b); Collins et al. (2009).

announcements and non-announcement periods. Thomas et al. advocate using this measure to infer information content because it is immune from the change in return noise.

In addition to the return variance-based measure, Beaver et al. (2020) use the trading volume-based measure (*AVOL*) to demonstrate an increasing trend in the information content of earnings announcements. The interpretation of the rising *AVOL* is also open to alternative explanations. Barron et al. (2018) propose an explanation related to the diversity of stock investors. As highlighted by Beaver (1968), the stock price revision during earnings announcements reflects the change in the average expectation of the entire market, while the abnormal trading volume at earnings announcements reflects the collective revisions of beliefs among all investors with differing views of the stock (Beaver, 1968). Barron et al. (2018) illustrate that due to the growing diversity of stock investors over time, the significance of earnings announcements in resolving investor disagreements, as evidenced by trading volume reactions, has increased between 1977 and 2011, especially for large firms. Thomas et al. (2022) also argue that the conclusion of increasing information content measured by *AVOL* may not be well-founded. They show that *AVOL* contain a similar bias as *AVAR*. Thomas et al. suggest that algorithmic and high-frequency trading can be a significant factor in trading volume unrelated to public disclosures, and such trading increases substantially during their sample period. Therefore, existing studies present conflicting views on a potential upward trend in the information content of earnings announcements as measured by *AVAR* or *AVOL*.

It is vital to determine whether earnings announcements become more informative over time. An upward trend suggests a significant change in firms' information disclosure behaviors. Schreder (2018) explains that the existing studies on information disclosures mainly focus on three attributes of information: quantity, precision, and asymmetry. Beaver et al. (2020) and Shao et al. (2021) suggest that the choice to disclose new material information can occur on an earnings announcement date, leading to an uneven distribution of information across days, which can be the fourth attribute of the information environment. Roychowdhury (2012) observes that earnings reports are more informative compared with other sources of information in a bad-news quarter than in a good-news quarter, indicating that earnings

reporting can help prevent arbitrary delays of bad news by firm managers. Therefore, the frequency of earnings reports and the disclosure of new information are crucial decisions for firms. Stoumbos (2023) demonstrates that information asymmetry increases between two earnings announcement dates and decreases immediately after a new earnings announcement.

The U.S. introduced the most sweeping reforms to the reporting regulation of public firms in 75 years after the outbreak of a few major corporate scandals in the early years of the new century (Shao et al., 2021). The reforms to corporate reporting requirements are aimed at improving the quality of financial disclosure and the information environment in the capital markets. Shao et al. (2021) show that the mandate of 8-K filings for earnings announcements increases the market reaction to earnings information, confirming the earlier findings of Lerman and Livnat (2010). However, Thomas et al. (2022) reinvestigate this issue and find that the change in return noise around the regulation fully explains the results: a reduction of return noise around the regulation leads to an increase in $AVAR$, which is not an informational effect. Relatedly, Arif et al. (2019) show that earnings announcements are increasingly accompanied by the release of 10-K filings, but the presence of concurrent 10-K filings is negatively related to the information content of earnings announcements. Hence, it is not obvious that new reporting requirements necessarily increase the information content of earnings announcements, and a global study on this matter is likely to be welcomed.

2.2. International studies on the information content of earnings announcements

This subsection summarizes several international studies on information content of earnings announcements, as measured by abnormal return variance and trading volumes during earnings announcements. International studies offer valuable insights into the topic by leveraging cross-country variations in formal and informal institutional arrangements. For instance, Landsman et al. (2012) find that the information content of earnings announcements improves after the mandated adoption of IFRS, with the impact of mandatory IFRS adoption contingent on the strength of legal enforcement in the adopting country. The enhancement of the information content of earnings announcements associated with the IFRS adoption can be attributed to the reduction of reporting lag, increased analyst following, and higher levels of foreign investment.

DeFond et al. (2007) demonstrate that a financial reporting environment characterized by better investor protection contributes to higher information content in earnings announcements. Bailey et al. (2006) discover that the change of reporting environment resulting from cross-listing to the U.S. market increases the information content of earnings announcements for non-U.S. firms. Lau et al. (2016) report that country-level corporate governance is positively related to the informativeness of earnings announcements. Kim et al. (2019) observe that insider trading regulation improves the information content of earnings announcements. Elfers and Koenraadt (2022) analyze cross-country variations in banking regulations and find that the market reacts more strongly to banks' earnings announcements in countries where the banking supervisor has less privileged information.

Aside from formal institutions at the country level, informal ones can also be important in shaping how investors perceive earnings news and react to them. Pevzner et al. (2012) show that societal trust drives cross-country variations in the information content of earnings announcements as measured by abnormal return variance and trading volume at earnings announcements. They find that trusting effects are more pronounced when a country's investor protection and disclosure requirements are weaker. Nguyen and Truong (2013) offer another cultural explanation for the differential informativeness of earning announcements across countries. They find that individualism is positively related to the information content of earnings announcements, while uncertainty avoidance is negatively related.

3. Research Design

Following Beaver (1968) and Landsman et al. (2012), we use two measures of information content of earnings announcements based on abnormal return volatilities and trading volumes, respectively. The underlying assumption is that material new information released during earnings announcements leads to increased return volatilities and trading volumes. The first measure of information content is referred to as the ratio of abnormal return variance (*AVAR*). It is calculated as the variance of residual returns in the three-day window [-1, 1] around the announcement date divided by the variance of residual returns in the estimation window [-120,

-6] before the announcement date.

Residual returns are derived from the market model, $R_{it} = \alpha + \beta \times M_t + \mu_{it}$, where R_{it} is the raw return of stock *i* on day *t*, M_t is the market return, and μ_{it} is the residual return. Following Bessembinder et al. (2023), we proxy the market return with the average daily returns of all stocks in the same stock exchange.[2] The model is estimated using daily returns from day t-120 to day t-6. We require a minimum of 60 observations in estimation. Daily residual returns in the estimation window are simply the in-sample regression residuals. Daily residual returns in the event window, on the other hand, are the out-of-sample prediction errors of a linear model, $\hat{\mu}_{it} = R_{it} - (\hat{\alpha} + \hat{\beta} \times Mkt_t)$, where $\hat{\alpha}$ and $\hat{\beta}$ are the coefficient estimates of the model. Residual returns are also known as abnormal returns.

The variance of residual daily returns around earnings announcements is proxied by the simple average of squared daily residual returns from day t-1 to day t+1.[3] Subsequently, the return variance-based measure of information content for stock i on date t is

$$AVAR_{it} = \frac{1}{3}\sum_{j=-1}^{1} \hat{\mu}^2{}_{i,t+j} / {\sigma_{it}}^2, \quad (1)$$

where $\hat{\mu}^2{}_{i,t+j}$ is the squared residual return on day $t + j$, *j*=-1, 0, +1; σ_{it} is the standard deviation of daily residual returns in the estimation window.

The trading volume-based measure of information content of earnings announcements (*AVOL*) is calculated as the difference in mean trading volumes between the announcement window [-1, 1] and the pre-announcement window [-120, -6], with the difference further scaled by the standard deviation of daily trading volume.[4]

[2] We winsorize individual stock returns at 0.5% on both ends of the distribution before computing the daily average of stock returns.
[3] As an alternative metric, we can use the sum of squared daily abnormal returns from day t-1 to day t+1 to measure the return variance of earnings announcements.
[4] The definition of *AVOL* follows Landsman et al. (2002), who argue that is able to control for secular increase in trading volume and is preferred over the original metric of abnormal trading volumes from Beaver (1968).

$$AVOL_{it} = \frac{1}{3}\sum_{j=-1}^{1}(vol_{i,t+j} - mvol_{i,t})/stdvol_{i,t}, \quad (2)$$

where $vol_{i,t+j}$ is the trading volume of stock *i* on day $t+j$ with $j = -1, 0, +1$; $mvol_{i,t}$ is the mean daily stock trading volume from day t-120 to day t-6; $stdvol_{i,t}$ is the standard deviation of daily trading volume from day t-120 to day t-6. We require a minimum of 60 observations in the pre-announcement window [-120, -6] for the above calculations.

4. Data and Sample

We assemble a sample of truly global firms, including those from the United States and Canada. The quarterly file of the Compustat Global database is used to identify a sample of publicly listed firms outside North America. Following Bessembinder et al. (2023), we exclude securities that are listed on OTC or stock-connect markets and only consider those primary issues if a company has multiple listings in more than one market (data field: PRIROW). Daily stock returns and firm fundamental information are retrieved from Compustat Global. Earnings announcement dates are obtained from IBES Global (DeFond et al., 2007). Consequently, our sample is limited to relatively large firms mostly with analyst coverage: firms common to both databases represent approximately one third of the Compustat universe. We use SEDOL codes to match the two databases since CUSIP codes in Compustat Global are essentially SEDOL codes for non-US firms (Katselas et al., 2016).[5] For the firms listed in the United States and Canada, we use the Compustat North America database and follow similar procedures as outlined above.

To be included in the sample, we also require that each announcement has non-missing values on both measures of informativeness (*AVAR* and *AVOL*). We follow Beaver et al. (2018, 2020) and Thomas et al. (2022) in selecting control variables in regression analyses. Reporting lag (*RptLag*) is the number of days between the fiscal period end date for reported earnings and

[5] We manually collect data on the trading hours of each stock exchange, as well as the local Daylight-Saving Time each year. The timestamp of earnings announcement dates, as per the IBES manual, is in the U.S. Eastern Standard Time. We defer earnings announcements to the next trading date if the announcement is made after trading hours. However, since our measure is defined within a three-day window [-1, 1], the reference will be robust even if we do not make this post-trading hour adjustment to earnings announcement dates (Berkman and Truong, 2009).

the earnings announcement date. The fiscal end month can also be important in explaining the relative informativeness of earnings announcements: *nonDec* is a dummy variable indicating that the fiscal period end date falls in a month other than December. Firm size, denoted by *Me*, is measured by the total market cap of the firm.

Beaver et al. (2020) demonstrate that having more detailed line items in earnings reports increase the informativeness of earnings announcements. *FS* is the proportion of financial data items that are not missing, reflecting the extent of disclosures. A higher *FS* value is linked with a more comprehensive earnings report. The number of analysts providing earnings forecasts for a company (*NumAna*) is also a significant factor in the information environment. Beaver et al. (2020) discover that analyst earnings forecasts and managerial earnings guidance on the same day as earnings announcements contribute to the increasing information content of earnings announcements. *AF* is a binary variable indicating the presence of at least one earnings forecast made by an analyst on the earnings announcement date. *Guidance* is another binary variable indicting the provision of managerial earnings guidance on the announcement date. The informativeness of earnings announcement can be reduced for non-profitable firms. Therefore, we introduce a binary variable to indicate whether the firm is a loss firm (*Loss*) reporting negative net income before extraordinary items (IBQ data field).[6] To mitigate the impact of outliers in regression analyses, we winsorize all continuous variables at the 1st and 99th percentiles annually.

Table 1 is here.

Data availability is limited before 2000 in Compustat Global (DeFond et al., 2007). Therefore, our sample period is chosen to be from 2000 to 2023, following Beaver et al. (2020) whose sample also starts from 2000. Table 1 presents descriptive statistics on our sample. Panel A displays the number of observations for each year, while Panel B offers summary statistics on the main variables. For instance, the average of *AVAR* is 2.54, and the average of *AVOL* is

[6] For a small fraction of firms that report missing IBQ in the quarterly file, we rely on the data field EPSEXCON (earnings per share excluding extraordinary items and on a consolidated basis) in the annual file.

0.56. These values indicate that return variance around earnings announcements is, on average, 2.54 times the return variance at other times, and that daily trading volume exceeds the normal level by 56% of the usual magnitude of daily variation in trading volumes. Unreported analyses indicate that our sample of global firms includes 41,971 unique firms (identified by GVKEY), of which 7,953 are listed in the United States. The sample encompasses 58 countries or regions, as detailed in Internet Appendix Table IA1.[7]

5. Empirical Analyses

5.1. The main finding

Our sample of global firms includes those that do not report earnings on a quarterly basis due to their unique regulatory requirements, among other reasons. Consequently, two consecutive quarters are not comparable in terms of the composition of sample firms. Therefore, we calculate the average inforamtion content of earnings announcemnts on an annual basis. This approach aligns with Beaver et al. (2020), who also present annual averages for a quarterly sample.

Figure 1 is here.

Figure 1 displays the cross-sectional average information content of all firms each year from 2000 to 2023 as measured by *AVAR* and *AVOL*. We find that there is a pronounced increase in *AVAR* and *AVOL* over the years. To be specific, the mean of *AVAR* was around 1.9 in 2000 and was approximately 3.3 in 2023. The mean of *AVOL* was a little less than 0.4 in 2000 and exceeded 0.8 in 2023. From this figure, we also observe two troughs in 2009 and 2021, respectively. Thomas et al. (2022) attribute the troughs of informativeness to the turmoil in market conditions at the time: there was a high volatility following the global financial crisis breakout in 2008. The same can be said about the period of 2021 following the outbreak of the

[7] We limit our sample to countries or regions with data available from 2006 onward, which are, so to speak, relatively significant economically. Removing this restriction expands the sample to 77 countries or regions. However, this change results in only a 2% increase in the number of observations and does not significantly affect our final results.

COVID-19 pandemic in 2020. High stock return volatilities and trading volumes prior to earnings announcements make the announcements less informative.

It is essential that we control for various factors that may drive earnings announcement informativeness to establish whether there is truly an upward trend. Hence, following Beaver et al. (2020), Thomas et al. (2022), and Landsman et al. (2002), we estimate a linear regression model which includes a time trend variable (*Year*) and control variables as follows.

$$IC_{i,t} = \alpha + \beta \times Year_t + \gamma \times X_{it} + \varepsilon_{i,t} \quad (3)$$

where $IC_{i,t}$ denotes the measure of the information content (*AVAR* or *AVOL*) for firm *i* reporting earnings on day t, $Year_t$ denotes the year of day t, X_{it} denotes control variables, and $\varepsilon_{i,t}$ denotes regression residuals. The coefficient β on the time trend variable, *Year*, is the paramter to watch. If it is significantly positive, we can conclude that there is an upward trend in the information content of earnings announcements.

Table 2 is here.

Table 2 presents the estimation results of various models with the standard errors double-clustered by firm and year. In Column 1, the return variance-based informativeness measure (*AVAR*) is the dependent variable. The coefficient estimate on *Year* is 0.051, which is statistically significant with a t-value of 4.99. This suggests a notable increase in the information content of earnings announcements over time. In Column 2, the dependent variable is the trading volume-based informativneness measure (*AVOL*), showing a similar trend: the coefficient estimate on *Year* is 0.015 with a t-value of 4.61. Columns 3 and 4 further include country fixed effects, and the results remain consistent. The results in the two columns can be utilizied to assess the manitude of the time trend in the information content of earnings announcements, as indicated by *AVAR* or *AVOL*.

We will now discuss the coefficient estimates on control variables. In Column 1, the natural logarithm of firm size (*Me*) is negatively related to earnnings announcement informativeness. Thus, the information content of large-sized firms is smaller, indicating that

their pre-disclosure information is relatively rich. This result is consistent with Atiase (1985). The coefficient estimate on *FS*, the proportion of non-missing line items in financial statements, is significantly positive. This indicates that providing more detailed and disaggregated information in the earnings report leads to more informative earnings announcements. This result is intuitive and also consistent with Beaver et al. (2020).[8] The natural logarithm of of the number of analysts is positively related to informativeness of announcements. Thus, more anlyst coverage leads to a better dissemination of information which is helpful in the information content of earnings announcements. The estimates on *AF* and *Guidance* are also in line with Beaver et al. (2020) who investigated the U.S. market. The coefficient estimate on *AF* is significantly positive, which means that if analysts provide concurrent earnings forecasts on the earnings announcement date, the market is more receptive to earnings news. The same effect can be observed for the coeffcient estimate on *Guidance*, the indicator variable on whether managers provide guidance on future earnings on the day of earnings announcements.[9] Meanwhile, the coefficient estimate on *Loss* is significantly negative, which confirms Thomas et al. (2022): earnings announcements of loss firms are less informative.

To gauge the incremental explanatory power of certain variables on the time trend of information content, we can omit them from the model and compare coefficient estimates on the time-trend variable (*Year*) around the change. In Column 5, we drop the three variables of concurrent disclosures, *FS*, *AF*, and *Guidance*. We find that the coefficient estimate increases to 0.086 from 0.067 (see Column 3). This indicates that concurrent disclosures collectively explain 28% (=0.086/0.067-1) of the rising trend in information content of earnings announcements.

To facilitate the comparison of our estimation results with those in Beaver et al. (2020), we introduce one-day abnormal return variance (denoted as *AVAR0*), which is the primary

[8] In analyses that are not reported, using the proportion of non-missing items for a specific category of financial statements instead of the entire financial statement (*FS*), including the balance sheet statement (*BS*), the income statement (*IS*), and the statement of cash flows (*SCF*), respectively, the results are qualitatively similar.

[9] The two dummy variables are determined based on whether analyst forecasts and managerial guidance occur on the earnings announcement date. If we apply a window of [-1, 1] around the announcement date, we would have more concurrent disclosures as defined.

variable in their study. It is calculated as the squared residual returns on day 0 divided by the pre-announcment return variance. Column 7, using *AVAR0* as the dependent variable, reveals that the coefficient estiamte on *Year* is 0.163, representing 58% (=0.163/0.282) of Beaver et al.'s estimate (refer to their Column 8 in Table 4). Beaver et al. (2020) also present results using three-day *AVAR* as the dependent variable in their Internet Appendix (Table IA6). The estimate in Column 3 of our Table 2 is approximately 65% (=0.067/0.103) of Beaver et al.'s estimate.

5.2. Pre-announcement versus post-announcement information

We investigate whether the increasing information content of earnings announcements is more related to pre-announcement trading as studied by Yang et al. (2020) or post-announcement trading. This aspect was not examined by Beaver et al. (2020).[10] We assess the information content for the pre-announcement window [-5, -1] and the post-announcement windows [0, 1]. The measure of information content before the announcement, *AVAR_pre*, is calculated as the average of squared residual returns in the pre-announcement window divided by the variance of daily residual returns in the estimation window [-120, -6]. The measure of information content after the announcement, *AVAR_post*, aims to capture abnormal return volatilities in the window [0, 1]. Similarly, *AVOL_pre* and *AVOL_post* indicate abnormal trading volumes before and after earnings announcements, respectively.

Figure 2 is here.

Figure 2 illustrates the changes in pre- and post-announcement information content. In Panel A, it is evident that the mean of post-announcement abnormal return variance (*AVAR_post*) increases gradually over time. Conversely, the mean of pre-announcement abnormal return variance (*AVAR_pre*) shows a slight decline. Panel B displays a similar trend using trading volume-based measures of information content: *AVOL_post* experiences a significant increase over the years, while *AVOL_pre* shows a mild decrease.

[10] Using U.S. data and distinguishing between trading before and after earnings announcements, we find confirming evidence that the greater information content of earnings announcements is influenced by post-announcement trading.

Table 3 is here.

Table 3 displays the estimation results for models involving the four variables of information content as defined above. In Column 1, where *AVAR_pre* is the dependent variable, we find that the coefficient estimate on *Year* is significantly negative with a t-value of -2.17. This suggests a declining trend of information during the sample period, as evidenced in pre-announcement trading. In Column 2, where *AVAR_post* is the dependent variable, we find a significantly positive coefficient estimate on *Year* with a t-value of 6.96. This indicates that the increasing information content of earnings announcements is driven by post-announcement trading. Column 3 uses the trading volume-based measure of pre-announcement information content (*AVOL_pre*) as the dependent variable, revealing a declining trend that aligns with the results of Column 1. In Column 4, post-announcement abnormal trading volume (*AVOL_post*) is used as the measure of information content, showing a significant upward trend with a t-value of 6.99, consistent with the findings of Column 2. Therefore, the upward trend in the information content of earnings announcements is more evident in post-announcement trading rather than in pre-announcement trading. Perhaps in most countries around the world, practices of selective disclosures are being regulated, making abnormal return volatilities immediately before earnings announcements, as studied by Yang et al. (2020), a less prevalent issue, or such pre-announcement volatilities are less effective in capturing information asymmetry. Future studies could delve into this further and explore which explanation is more plausible.

5.3. Sources of rising information content

In this subsection, we investigate the factors driving the global increase in the information content of earnings announcements during our sample period. Building on the work of Beaver et al. (2020), we focus on variables associated with the information dissemination role of financial analysts and the information disclosure practices of managers. In our main analyses, we have shown that concurrent information disclosures, such as concurrent analyst earnings forecasts (*AF*), concurrent managerial earnings guidance (*Guidance*), and a more comprehensive earnings report with additional data items in financial statements (*FS*), are significant determinants of the information content of earnings announcements. Notably, our

findings indicate that after accounting for these three variables, the coefficient estimate on the time trend variable decreases by 28%. This underscores the critical role of these variables in driving the upward trend in the informativeness of earnings announcements. To further substantiate this assertion, we must also establish that these factors are indeed increasing over the sample period. While Beaver et al. (2020) employ plot analyses to demonstrate this trend in the U.S. market, we utilize regression analyses for more robust examination.

Table 4 is here.

Table 4 presents regression analyses on variables related to concurrent information disclosures. In Column 1, with *AF* as the dependent variable, it is observed that there is a growing trend of analysts making earnings forecasts on the same day as earnings announcements. The coefficient estimate on the time trend variable (*Year*) is significantly positive with a t-value of 2.48. Since *AF* is a binary variable (taking values of zero or one), the model used here is a linear probability model. Moving to Column 2, with *Guidance* as the dependent variable, it is evident that managers are increasingly providing guidance on future earnings when reporting past earnings. The t-value for the time trend of earning guidance is 8.27. In Column 3, using *FS* as the dependent variable, there is a noticeable upward trend. The coefficient estimate on *Year* is significantly positive with a t-value of 10.26, indicating that earnings reports are becoming more disaggregated and containing more line items. The remaining three columns focus on specific types of financial statements: *BS*, *IS*, and *SCF*, representing the proportion of non-missing data items in the balance sheet, income statement, and statement of cash flows, respectively. All three columns show an increasing trend over time. In conclusion, the increasing information content of earnings announcements is associated with concurrent information disclosures, which also exhibit a rising trend.

5.4. The role of bid-ask spread

Thomas et al. (2022) investigated the information content of earnings announcemet on U.S. stocks and found that bid-ask spreads are almost as important as new information in explaining the shift in *AVAR*, the return variance-based measure of information content. Therefore, it is

essential for us to examine whether the upward trend of global stocks is merely due to the reduction of bid-ask spreads. Thomas et al. (2022) inferred bid-ask spreads from high-frequency trading data. Since we only have low-frequency trading data on global stocks, we use the method proposed by Corwin and Schultz (2012) to estimate bid-ask spreads. Their study is a widely cited and their method uses high and low daily stock prices as inputs.

Table 5 is here.

Table 5 examines the extent to which bid-ask spreads account for the increase in the information content of earnings announcements of global stocks. The bid-ask spread (denoted as *Sprd*) is calculated from the daily high and low stock prices from year t-1, where t represents the year of earnings announcements. Column 1 reveals that even after adjusting for the bid-ask spread, the coefficient estimate on the time trend variable remains significantly positive. Therefore, bid-ask spreads do not diminish the increasing trend of information content in earnings announcements. A comparison of the estimation results between this column and Column 3 of Table 2 shows that including bid-ask spreads as an additional control enhances the coefficient estimate on the time trend variable and also raises the t-value associated with the estimate (increasing to 6.85 from 6.03). Incorporating bid-ask spreads in regressions is one of the three methods suggested by Thomas et al. (2022) to address the concern of return noise. Thus, the findings in this column indicate that the growing information content of earnings announcements is not due to a reduction in return noise. Additionally, this column indicates that the coefficient estimate on *Sprd* is significantly negative. This negative cross-sectional relationship aligns with the findings of Thomas et al. (2022), suggesting that stocks with higher trading costs have less informative earnings announcements.

Column 2 examines the interaction between the time trend variable and bid-ask spread (*Year*Sprd*) and reveals that the coefficient estimate on the interaction term is significantly negative. This suggests that the information content of earnings announcements increases at a slower rate among stocks with a higher bid-ask spread. This finding is intriguing and implies that return noise is unlikely to be a factor influencing the upward trend of information content. As argued by Thomas et al. (2022), return noise contributes to both the denominator and the

numerator of *AVAR*. A reduction in return noise decreases both the denominator and the numerator, leading to an overall increase in *AVAR*. To illustrate, imagine that return noise is exceptionally high, causing both the denominator and numerator of *AVAR* to mainly reflect return noise, resulting in *AVAR* being close to 1. A reduction in return noise would then elevate *AVAR* above 1, even without new information. If the reduction in return noise is the main driver of our finding, it should be more pronounced among stocks with higher return noise in the prior period. However, Column 2 indicates the opposite.

Columns 3 to 4 conduct analyses similar to those in the preceding two columns using *AVOL* as the dependent variable, and the results are qualitatively similar. Column 5 uses the bid-ask spread as the dependent variable. This column shows that there is no reduction in the bid-ask spread over time for our sample stocks as the coefficient estimate on *Year* is not significant.[11] This again suggests that return noise is not the reason for our finding. Column 6 uses the difference between the numerator and the denominator of *AVAR* as an alternative measure of information content (denoted as *DVAR*), which Thomas et al. (2022) advocate is the right measure to use when investigating information content. This column shows that the finding is robust with a t-value of 3.88. Column 7 uses the numerator of *AVAR* as the dependent variable (denoted as *VAR-ANN*). It is the mean of squared residual daily returns from day -1 to day 1. In this column, we can see that the numerator exhibits an increasing trend with a t-value of 3.53. On the other hand, Column 8 shows that the denominator of *AVAR* exhibits a decreasing trend with a t-value of -2.64. The analyses in the last two columns resemble those in Beaver et al. (2020) and were also mentioned by Thomas et al. (2022) as the third method to tackle the return noise concern. The results in the last two columns again indicate that return noise is not the reason behind the trend: there is no reduction of return noise over time leading to a larger *AVAR*. In summary, this table shows that return noise is not an important factor driving the upward trend of information content of earnings announcements for global stocks.

[11] Here, we use the bid-ask spread as of year t as the dependent variable. The results are fairly similar if we employ the lagged bid-ask spread from year t-1, which is used as the explanatory variable in other models in the table.

5.5. The impact of institutional ownership

We examine whether institutional ownership has a material effect on information environment of the firm as indicated by *AVAR* and *AVOL*. El-Gazzar (1998) finds that institutional ownership is inversely related to the informativeness of earnings announcements as measured by *AVAR*. El-Gazzar argues that a greater number of institutional investors is associated with increased acquisition of private information, and also encourages more voluntary disclosures by the firm prior to the earnings announcement. On the other hand, Hotchkiss and Strickland (2003) contend that institutional investors are active traders who tend to act on forthcoming earnings news, thereby inducing a strong price response.[12] Given the two conflicting arguments, we need to determine whether institutional ownership influences the global upward trend in earnings announcement informativeness.

Regarding trading volumes surrounding earnings announcements, the variation in information precision among investors is a significant factor, in addition to the pre-disclosure information environment and the short-term trading tendencies of institutional investors. Utama and Cready (1997) demonstrate that *AVOL* is positively correlated with institutional ownership, provided that institutional ownership is not excessively high, suggesting a quadratic relationship between the two. They attribute their findings to the theory that the precision of information among different investors prior to disclosure influences trading volume at the time of announcements (Kim and Verrecchia, 1991).

Table 6 is here.

We are able to obtain data on institutional ownership for all sample firms, except those from Canada. Specifically, we utilize the LSEG Global Ownership database for non-North American data and the LSEG 13F database for the data on U.S. firms. We retrieve institutional ownership figures at the end of the previous quarter.[13] Column 1 of Table 6 demonstrates

[12] Mian et al. (2011), unpublished, examine U.S. data and find that the increase in institutional stock ownership over time—particularly by institutions focused on short-term performance—is positively associated with the increasing stock market response to earnings announcements.

[13] We set missing institutional ownership to zero and exclude those country-quarters in which all observations report missing institutional ownership.

that stock ownership (*InstOwn*) exhibits an increasing trend over our sample period, as indicated by the significantly positive coefficient estimate for the time trend variable, *Year*, which has a t-value of 2.56. Each quarter in each market, we categorize the stocks into two groups based on *InstOwn*. Columns 2 and 3 reveal that the binary ranking of *InstOwn* is positively correlated with the increasing trends of *AVAR* and *AVOL*, respectively. For instance, in Column 2, the magnitude of the time trend for stocks with low institutional ownership (the base case) is 0.058, as indicated by the coefficient estimate for *Year*, while for stocks with high institutional ownership, the magnitude of the time trend is 38% larger (0.022/0.058). In the final three columns of the table, where we exclude U.S. stocks and repeat the analyses, the effects appear to be even stronger: the three coefficients of interest have all increased by approximately 20%.

5.6. Country-level analyses

We examine the time trend in the information content of earnings news in relation to several country-specific factors. We aggregate the main stock-level dataset to the country level, using the mean values of the variables for each country-quarter. We then merge country-specific factors into the dataset, including whether the market is developed, the restrictiveness of insider trading laws prior to the sample period, and the initial scores of securities regulations at the start of the sample period.

A convergence of information environments across markets could theoretically explain the increase in earnings informativeness in some countries. First, reporting and accounting standards have become more homogeneous due to the widespread adoption of IFRS. Second, equity markets have grown less segmented over time because of increased capital mobility (Bekaert et al., 2011). As a result, investor demand for information has become more uniform, prompting firms worldwide to provide more comparable financial disclosures. Consistent with this, Conaway (2022) finds that financial reporting has indeed grown more comparable across markets. However, the convergence of information environments is not guaranteed. Leuz and Wysocki (2016) argue that accounting standard harmonization faces significant barriers.

We differentiate between developed and developing markets. If developing markets converge with developed markets in terms of information environments, we might see their impact on *AVAR* and *AVOL*. Following Bessembinder et al. (2023), we regard the following markets as developed: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, Taiwan, the United States, and the United Kingdom. The remaining markets in the sample are classified as developing markets. We use a dummy variable, *Developed*, to represent developed markets.

Countries also vary in how strictly they regulated insider trading prior to the sample period (Denis & Xu, 2013). If insider trading is associated with lower earnings informativeness, and if some countries have converged in their enforcement of insider trading laws to higher levels, we might observe an increase in earnings informativeness for these countries. In other words, we might expect to see a greater trend for countries with more prevalent insider trading prior to the sample period, as these countries have a larger room for improvement in insider trading restrictions. Similarly, if securities regulations—such as disclosure requirements and public enforcement mechanisms, as emphasized by La Porta et al. (2006)—play a key role in shaping the magnitude of *AVAR* and *AVOL*, we would expect the time trends to differ across countries based on their initial regulatory strength at the start of the sample period.

We obtained data on the restrictiveness of insider trading for each country from Denis and Xu (2013). The variable, *ITR_index_1999*, represents the insider trading restriction index based on a survey in the 1999 Global Competitiveness Report, as provided by Denis and Xu (2013), with a higher index value indicating greater restrictions on insider trading.[14] Additionally, we sourced data on securities regulations for each country from La Porta et al. (2006). Specifically, we focus on disclosure requirements and public enforcement, which La Porta et al. identify as the two most critical aspects of securities regulations.

[14] In unreported analyses, we use Beny's (2005) measure of insider trading law as an alternative measure and find similar results.

Table 7 is here.

Table 7 shows the results of country-level analyses. In all the models, country fixed effects are included, and t-values for coefficient estimates are based on robust standard errors. Column 1 confirms that there is an upward trend in *AVAR* using the newly constructed country-quarter dataset. Column 2 examines the impact of market types (developed versus developing). It does not include the dummy variable, *Developed*, which would be absorbed by country fixed effects. It shows that the coefficient estimate on *Year* is 0.043, which is statistically significant. The coefficient estimate on the interaction term, *Year*Developed*, is 0.041, which is also statistically significant. This means that both developed and developing markets experience a dramatic rise in *AVAR*, with the magnitude of the developed markets being about twice as large as that of the developing markets.

Column 3 of Table 7 indicates that the coefficient estimate for the interaction between *Year* and *ITR_index_1999* is significantly positive. This suggests that countries with more restrictive insider trading environments prior to the sample period experience a larger increase in *AVAR* than anticipated. We initially speculated that countries with lenient insider trading regulations would catch up to developed nations, prompting investors to rely more on public earnings news, which would, in turn, lead to an increase in *AVAR*. Therefore, the findings in this column imply that the convergence in insider trading restrictiveness across countries does not account for the upward trend in *AVAR*. The results for *AVAR* presented in columns 1 to 3 are corroborated by the findings in columns 5 to 7, which are based on *AVOL*. Columns 4 and 8 investigate two variables related to security regulations, yielding mixed results in terms of both sign and statistical significance. In unreported analyses, we found no significant results when controlling for the interaction between *Year* and *Developed*. Consequently, we conclude that the variations in how countries are assessed regarding security regulations do not materially influence the increasing trend in the information content of earnings announcements.

To summarize, country-level analyses reveal that developed markets and those with more restrictive insider trading regulations initially experience a greater increase in the information content of earnings announcements. The results indicate that the convergence of accounting

standards, insider trading laws, and securities regulations across borders does not account for the global upward trend in the informativeness of earnings announcements.

5.8. Robustness tests

The return variance-based measure of information content, *AVAR*, is essentially the squared residual returns after scaling and can therefore suffer from skewness. However, the skewness of *AVAR* does not prevent Beaver et al. (2020) from using it in empirical tests because *AVAR* has a clear statistical property: as a statistic, it follows an F distribution (Patell and Wolfson, 1981; Beaver et al., 2020). Beaver et al. conducted multiple robustness tests to address the skewness concern of *AVAR*. On the other hand, Thomas et al. (2022) and Landsman et al. (2012) recommend log-transformation of the measure to address the skewness concern.

Table 8 is here.

Column 1 of Panel A of Table 8 shows that when using the natural logarithm of *AVAR* as the dependent variable, there is robust evidence of an upward trend in information content. The skewness concern also applies to *AVOL*. Since *AVOL* represents trading volumes during announcements minus average trading volume at other times, it can sometimes assume a negative value and cannot be log-transformed. Therefore, we introduce an alternative volume-based measure (*AVOL2*), which is the ratio of the mean trading volume during announcements to the mean trading volume before announcements. In Column 2 of Panel A, the natural logarithm of *AVOL2* is the dependent variable, yielding a qualitatively similar result.

This panel allows us to relate our findings to earlier studies that also utilized the log of *AVAR* or *AVOL*. Landsman et al. (2012) demonstrated that adopting IFRS increases the log of *AVAR* by 0.186 (refer to Column 3 of Panel A in their Table 7). Note that the change in the log of *AVAR* represents the rate of change in *AVAR*. Therefore, in Panel A, the annual increase rate in *AVAR* for global stocks is 0.023, which is approximately 12% (=0.023/0.186) of the IFRS adoption effect as documented by Landsman et al. Similarly, we calculated that the annual increase rate in *AVOL* for global stocks is 19% (=0.014/0.073) of the IFRS adoption effect.

Our sample of earnings announcements includes both quarterly and annual earnings announcements. The end date of the fiscal quarter for the reported earnings can sometimes also be the end of the whole fiscal year, thus falling into the category of annual earnings announcements. We conduct separate analyses on the two types of earnings announcements. Panel B of Table 8 demonstrates that the finding is consistent across both subsamples: both types of earnings announcements exhibit an increasing information content trend over time.

The increasing information content of earnings announcements could be attributed to changes in the composition of sample firms over time. For instance, the inclusion of new firms in the sample during a specific year could influence the average informativeness for that year. The same applies to firms exiting the sample. To mitigate this issue, we incorporate firm fixed effects. Panel C demonstrates that the observation regarding the time trend remains relatively stable when accounting for firm fixed effects. Conversely, the significance of firm size and analyst coverage diminishes in the regressions.

Our primary sample of global and non-U.S. firms is constructed using the quarterly file of Compustat Global. The coverage of the quarterly file is relatively limited before 2000. Instead of relying on the quarterly file, we can utilize the annual file of Compustat Global to create an alternative sample of global firms. This alternative sample includes only annual earnings announcements. Consistent with DeFond et al. (2007), this new sample of global annual earnings announcements can be traced back to 1995 due to the improved data coverage of the annual Compustat file. As shown in Panel D of Table 8, the findings remain robust in this alternative sample.

6. Concluding Remarks

Complementary to Beave et al. (2020), our study reveals a significant upward trend in the informativeness of earnings announcements worldwide from 2000 to 2023. The increase in the information content of earnings announcements is attributed to the growth in the post-announcement trading of information. Meanwhile, the pre-announcement trading of new information is actually declining. Therefore, our study demonstrates that the market as a whole

absorbs a substantial amount of new information upon announcements, and more information has been concentrated within earnings announcements compared to other periods.

Regarding the sources of the increasing information content of earnings announcements, we find that concurrent information disclosures are a significant contributor, explaining 28% of the upward trend. Concurrent information disclosures refer to managerial earnings guidance and analyst earnings forecasts released on the same day as earnings announcements, as well as a more detailed earnings report containing more line items. On the other hand, return noise is not a factor behind the rising information content for our sample of global firms. This contrasts with Thomas et al. (2022), who show that return noise is nearly as important as the arrival of new information in making earnings announcements more impactful. We differentiate between developed and developing markets and observe that the rising information content of earnings announcements is evident in both categories of markets, particularly in developed markets. Country-level analyses on insider trading and security regulations suggest that a global converge in these aspects, if it exists, does not explain our finding.

The change in the information disclosure pattern has certain economic implications. For instance, managers are increasingly found to provide earnings forecasts on the same day as earnings announcements, and doing so contributes to the higher information content of earnings announcements. The managers could have disclosed more forward-looking information even earlier to preempt the market response to earnings announcements. Not immediately disclosing any information constitutes a delay in information disclosure. In future studies, we could examine the economic consequences of information disclosure delays associated with the rising concentration of information around earnings announcement dates for global firms. As shown in Easley and O'Hara (2004), not immediately disclosing information or shifting signals from public to private leads to more risk premiums required as compensation for investors.

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Appendix A: The definitions of main variables

Variable	Definition
AVAR	Abnormal return variance, defined as the average of the squared daily residual returns during earnings announcements from day -1 to day 1, divided by the standard deviation of daily residual returns in the estimation window from day -120 to day -6.
AVOL	Abnormal trading volume, defined as the difference between the mean of daily trading volume during earnings announcements from day -1 to day 1 and the mean of daily trading volume in the estimation window from day -120 to day -6. This difference is further scaled by the standard deviation of daily trading volume in the estimation window. Daily trading volume is defined as the number of shares traded divided by the number of shares outstanding.
Year	The calendar year of the earnings announcement date. The coefficient before this variable captures the time trend in the information content of earnings announcements.
RptLag	The reporting lag of earnings reports, defined as the difference between the announcement date and the fiscal period end date for the reported earnings.
nonDec	A dummy variable indicating that the end month of the fiscal period for the reported earnings is not December.
Me	Market capitalization of the firm, defined as the market value of shares outstanding.
IS	The proportion of non-missing line items in the income statement, calculated in the same manner as detailed in the Internet appendix of Beaver et al. (2020).
BS	The proportion of non-missing line items in the balance sheet statement, calculated in the same manner as detailed in the Internet appendix of Beaver et al. (2020).
SCF	The proportion of non-missing line items in the cash flow statement, calculated in the same manner as detailed in the Internet appendix of Beaver et al. (2020).
FS	The proportion of non-missing line items of all financial statements, calculated in the same manner as detailed in the Internet appendix of Beaver et al. (2020).
NumAna	Number of analysts providing earnings forecasts (annual or quarterly) for the firm in the one-year period leading up to the earnings announcement date.
AF	A dummy variable indicating whether analysts provide earnings forecasts on the same day as earnings announcements.
Guidance	A dummy variable indicating whether firm managers provide earnings guidance on the same day as earnings announcements.
Loss	A dummy variable indicating that the reported earnings before extraordinary items are negative.

AVAR0	One-day abnormal return variance ratio which is equal to the squared residual return on day 0 divided by the variance of residual returns from day -120 to day -6.
Sprd	The bid-ask spread estimated using daily high and low stock prices from year t-1, as in Corwin and Schultz (2012).

Figure 1: Average information content each year

This figure illustrates the average informativeness of earnings announcements each year from 2000 to 2023, as measured by abnormal return variance (*AVAR*) and abnormal trading volume (*AVOL*). *AVAR* is calculated as the return volatilities during earnings announcements in the window [-1, 1] relative to announcement dates, divided by the return volatilities in the window [-120, -6] before announcements. *AVOL* is determined as the mean of daily trading volume in the window [-1,1] minus the mean of daily trading volume in the window [-120, -6], with the difference further divided by the standard deviation of daily trading volume in the window [-120, -6].

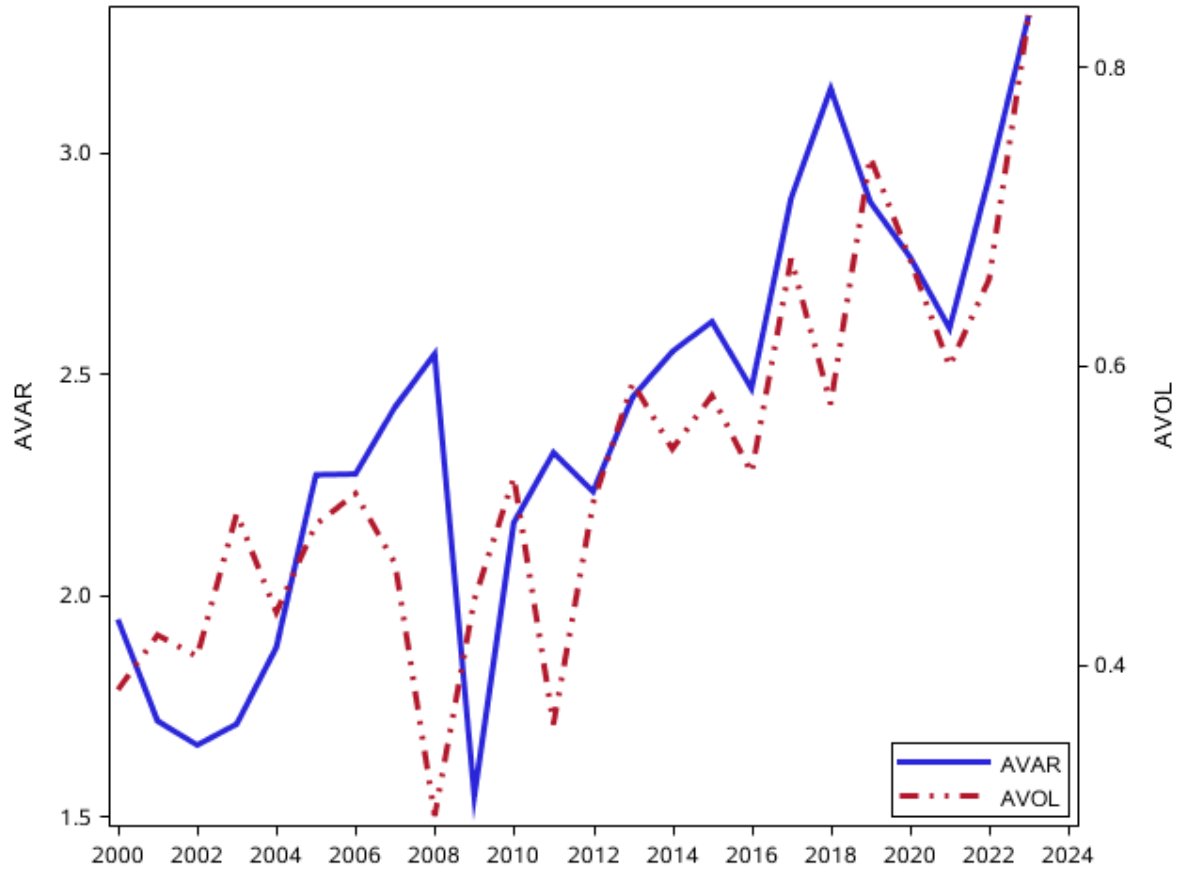
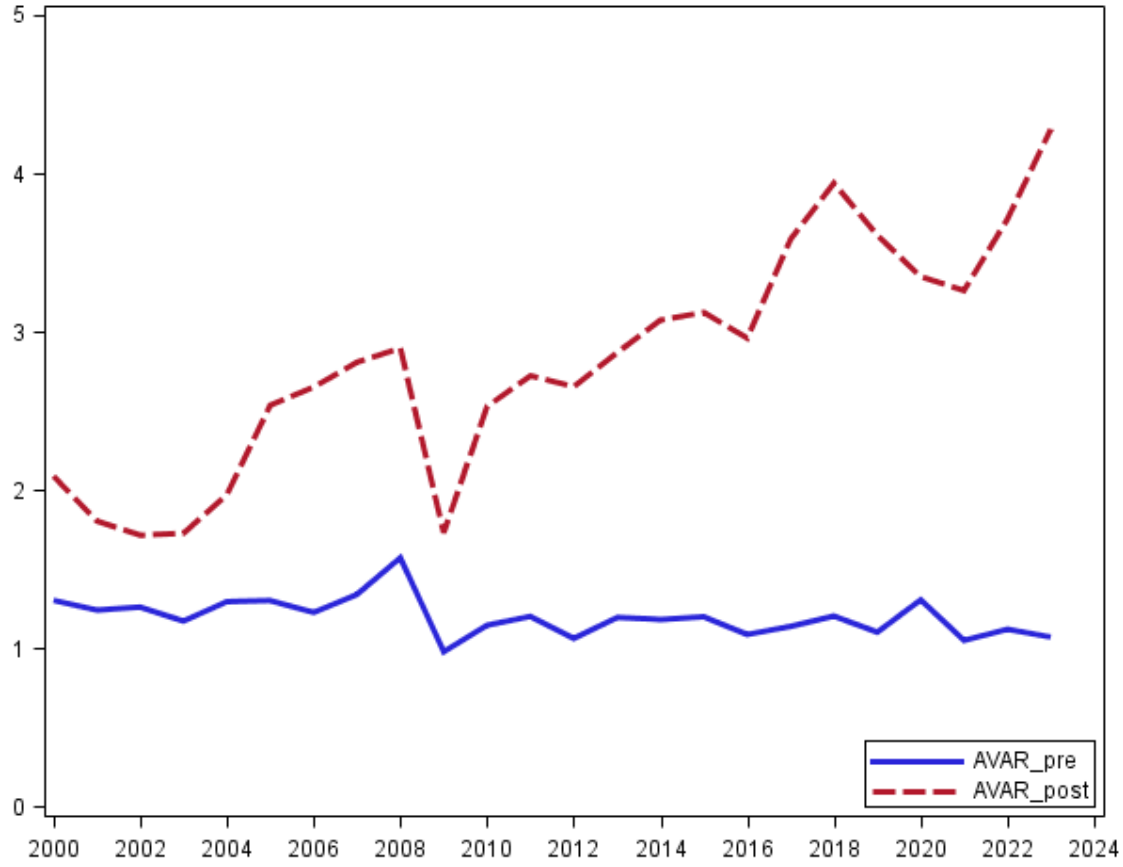


Figure 2: Pre-announcement versus post-announcement information

The pre-announcement window is the window [-5, -1] relative to the announcement date, and the post-announcement window is the window [0, 1]. *AVAR_pre* is the return variance-based measure of information content for the pre-announcement window, while *AVAR_post* is the return variance-based measure of information content for the post-announcement window. *AVOL_pre* is the trading volume-based measure of information content for the pre-announcement window, while *AVOL_post* is the trading volume-based measure of information content for the post-announcement window. The annual average information content is plotted. Panel A shows the results of return variance-based measures, while Panel B shows the results of trading volume-based measures.

Panel A: Pre- and post-announcement abnormal return variance



Panel B: Pre- and post-announcement abnormal trading volume

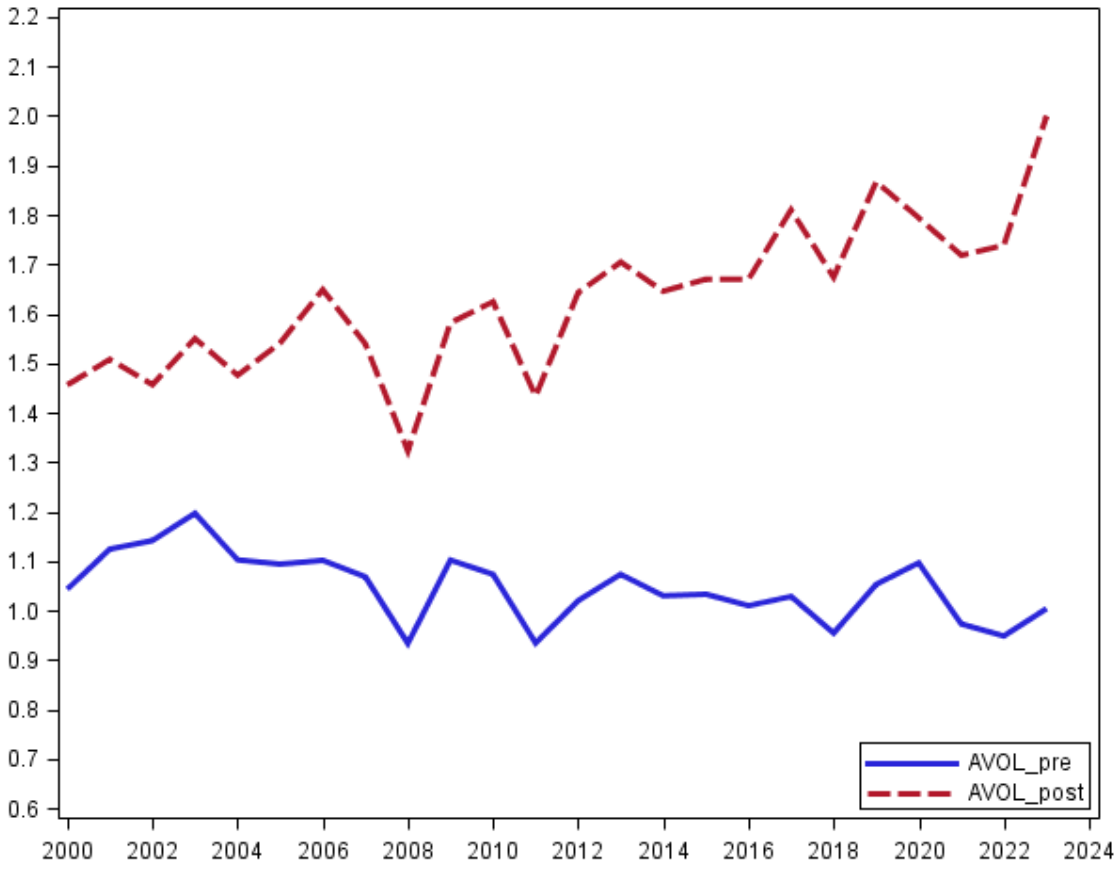


Table 1: Description of the sample

This tables provides descriptive statistics on our sample of global firms from 2000 to 2023. Our sample is constructed by merging the Compustat Global and North America quarterly files which provides fundamental information, and the IBES Global database, which provides earnings announcement dates. Panel A shows the number of observations each year. Panel B presents summary statistics on the main variables for the pooled sample. *RptLag* is the number of days between the fiscal period end date and the announcement date for the earnings of that fiscal period. *nonDec* is a binary variable indicating that the fiscal end-date falls in a month other than December. *Me* is the firm size proxy, measured by the total market cap of the firm in million USD. *FS* is the proportion of non-missing financial data items, reflecting the level of disclosures. *NumAna* is the number of analysts providing earnings forecasts for the firm. *AF* is the dummy variable indicating that analyst forecasts are made on the same date as earnings announcements. *Guidance* is a binary variable indicting whether managerial earnings guidance is provided on the same day as earnings announcements. *AVAR0* is the one-day abnormal return variance measure. *Loss* is a dummy variable indicating whether the firm is a in loss position. *Sprd* is the bid-ask spread of the stock. For more detailed definitions of the variables, please refer to Appendix A.

Panel A: Number of observations each year

Year	# obs.	% of total
2000	7544	0.82
2001	10783	1.18
2002	12229	1.34
2003	13288	1.45
2004	22529	2.46
2005	27368	2.99
2006	33485	3.66
2007	37635	4.11
2008	38389	4.2
2009	37210	4.07
2010	37653	4.12
2011	40571	4.43
2012	42286	4.62
2013	44818	4.9
2014	46556	5.09
2015	48198	5.27
2016	51132	5.59
2017	53623	5.86
2018	52948	5.79
2019	50985	5.57
2020	49384	5.4
2021	50257	5.49
2022	51710	5.65
2023	54272	5.93

Total	914853

Panel B: Summary statistics on the main variables

Variable	Mean	STD	P1	P25	Median	P75	P99	N
AVAR	2.54	4.51	0.02	0.37	1.00	2.59	25.45	914853
AVOL	0.56	1.49	-0.96	-0.32	0.07	0.91	7.34	914853
RptLag	57.94	55.55	16	34	45	60	330	914853
nonDec	0.73	0.45	0	0	1	1	1	914853
ME	3523	12958	6	91	361	1582	66819	914853
IS	0.67	0.35	0.00	0.55	0.82	0.91	1	914853
BS	0.76	0.2	0.04	0.75	0.83	0.88	1	914853
SCF	0.47	0.26	0.00	0.40	0.52	0.64	0.91	914853
FS	0.63	0.2	0.17	0.55	0.68	0.77	0.95	914853
NumAna	5.28	7.36	0	1	2	7	33	914853
AF	0.27	0.45	0	0	0	1	1	914853
Guidance	0.12	0.32	0	0	0	0	1	914853
Loss	0.21	0.41	0	0	0	0	1	914853
AVAR0	3.79	9.10	0.00	0.12	0.68	2.89	51.32	914715
Sprd	0.89	0.52	0.10	0.57	0.80	1.09	2.66	902106

Table 2: Regressions illustrating the time trend of information content

This table shows the time trend of information content in earnings announcements using regressions. *AVAR* and *AVOL* are two measures of information content of earnings announcements based on return volatilities and trading volume, respectively. *Year* is the year in which the earnings announcement is made. *RptLag* is the number of days between the fiscal period end date and the announcement date for the earnings of that fiscal period. *nonDec* is a dummy variable indicating that the fiscal end-date falls in a month other than December. *Me* is the firm size proxy, measured by the total market cap of the firm. *FS* is the proportion of non-missing financial data items, reflecting the level of disclosures. *NumAna* is the number of analysts who provide earnings forecasts for the firm. *AF* is the dummy variable indicating whether analyst forecasts are made on the same day as earnings announcements. *Guidance* is the dummy variable indicating whether managerial earnings guidance is provided on the same day as earnings announcements. *Loss* is a dummy variable indicating whether the firm is in a loss position. More detailed definitions of the variables can be found in Appendix A. Country FE refers to country or region fixed effects. Regression standard errors are clustered by firm and year. The t-values are reported in square brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	*AVAR*	*AVOL*	*AVAR*	*AVOL*	*AVAR*	*AVOL*	*AVAR0*
Year	**0.051*** **	**0.015*** **	**0.067*** **	**0.018*** **	**0.086*** **	**0.024*** **	**0.163*** **
	[4.99]	**[4.61]**	**[6.03]**	**[5.29]**	**[7.35]**	**[7.29]**	**[7.66]**
RptLag	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001
	[-0.81]	[-1.53]	[-0.87]	[-0.14]	[-1.10]	[-0.51]	[-1.12]
nonDec	-0.192	-0.178***	-0.061	-0.150***	-0.077	-0.156***	-0.047
	[-1.69]	[-6.06]	[-0.59]	[-4.94]	[-0.75]	[-5.11]	[-0.32]
Ln(*Me)*	-0.084***	-0.042***	-0.009	-0.016***	0.004	-0.012**	0.012
	[-7.97]	[-6.85]	[-0.81]	[-3.65]	[0.30]	[-2.47]	[0.51]
FS	0.660***	0.174***	1.034***	0.382***			2.159***
	[9.25]	[4.43]	[11.36]	[10.13]			[9.65]
Ln(NumAna)	0.148***	0.119***	0.042**	0.083***	0.194***	0.137***	0.053
	[6.80]	[12.58]	[2.41]	[10.52]	[10.14]	[19.81]	[1.47]
AF	0.864***	0.286***	0.582***	0.211***			1.307***
	[12.60]	[14.63]	[12.98]	[15.78]			[11.51]

Guidance	1.636***	0.469***	1.079***	0.329***			2.325***
	[9.74]	[10.85]	[7.44]	[7.78]			[6.87]
Loss	-0.249***	-0.156***	-0.392***	-0.192***	-0.400***	-0.194***	-0.813***
	[-7.32]	[-12.12]	[-10.91]	[-15.07]	[-11.39]	[-15.14]	[-10.45]
Constant	-98.484***	-29.304***	-132.958***	-35.421***	-171.063***	-47.871***	-327.108***
	[-4.83]	[-4.48]	[-5.93]	[-5.20]	[-7.23]	[-7.16]	[-7.58]
Country FE	No	No	Yes	Yes	Yes	Yes	Yes
Observations	914,853	914,853	914,853	914,853	914,853	914,853	914,715
R-squared	0.039	0.044	0.056	0.058	0.047	0.049	0.060

Table 3: Contrasting the time trends of pre- and post-announcement information

This table shows time trends of information content before and after earnings announcements. *AVAR_pre* represents information based on return volatilities in the window [-5, -1], while *AVAR_post* represents information based on return volatilities in the window [0, 1]. *AVOL_pre* represents information based on abnormal trading volume in the window [-5, -1], while *AVOL_post* represents information based on abnormal trading volume in the window [0, 1]. *Year* is the year of the earnings announcement. The definitions of other variables can be found in Appendix A. The regression standard errors are clustered by firm and year. The t-values are provided in square brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	*AVAR_pre*	*AVAR_post*	*AVOL_pre*	*AVOL_post*
Year	**-0.008****	**0.106*****	**-0.005****	**0.028*****
	[-2.17]	**[6.96]**	**[-2.43]**	**[6.99]**
RptLag	0.000	-0.000	0.000***	-0.000*
	[0.45]	[-0.55]	[4.23]	[-2.02]
nonDec	-0.074	-0.049	-0.104***	-0.149***
	[-1.62]	[-0.38]	[-5.16]	[-4.37]
Ln(Me)	-0.011*	0.012	-0.014***	-0.104***
	[-2.02]	[0.77]	[-4.51]	[-18.20]
FS	0.045	1.426***	0.030	0.494***
	[1.59]	[10.84]	[1.22]	[11.22]
Ln(NumAna)	-0.022***	0.086***	0.007	0.078***
	[-2.91]	[3.35]	[1.23]	[8.30]
AF	0.039***	0.761***	0.010	0.230***
	[3.16]	[11.85]	[1.14]	[15.99]
Guidance	-0.103***	1.632***	0.006	0.230***
	[-2.90]	[8.46]	[0.27]	[6.15]
Loss	-0.024*	-0.514***	-0.026***	-0.283***
	[-1.95]	[-10.35]	[-5.20]	[-16.46]
Constant	18.281**	-211.497***	10.423**	-52.141***
	[2.36]	[-6.88]	[2.80]	[-6.57]
Country FE	Yes	Yes	Yes	Yes
Observations	914,853	914,849	913,888	912,625
R-squared	0.004	0.067	0.006	0.047

Table 4: Sources of increasing information content

This table illustrates the sources of increasing information content related to concurrent analyst forecasts (*AF*) and managerial earnings guidance (*Guidance*), as well as more detailed financial statements. *AF* is the dummy variable indicating whether analyst forecasts are made on the same date as earnings announcements. *Guidance* is the dummy variable indicting whether managerial earnings guidance is provided on the same day as earnings announcements. *FS* is the proportion of non-missing financial data items, reflecting the level of disclosures. Definitions of the other variables can be found in Appendix A. Country FE refers to country or region fixed effects. Regression standard errors are clustered by firm and year. The t-values are reported in square brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	*AF*	*Guidance*	*FS*	*BS*	*IS*	*SCF*
Year	**0.005****	**0.011*****	**0.004*****	**0.004*****	**0.010*****	**0.002*****
	[2.48]	**[8.27]**	**[10.26]**	**[10.59]**	**[6.53]**	**[6.10]**
RptLag	-0.000**	0.000	-0.000	-0.000	-0.000***	0.000**
	[-2.61]	[0.16]	[-0.63]	[-0.25]	[-5.29]	[2.12]
nonDec	-0.012***	-0.004	-0.005**	0.011**	0.009	-0.027***
	[-4.45]	[-1.38]	[-2.09]	[2.52]	[0.85]	[-6.04]
Ln(Me)	0.019***	0.012***	-0.010***	-0.009***	-0.000	-0.015***
	[11.22]	[5.05]	[-9.58]	[-10.83]	[-0.25]	[-9.76]
Ln(NumAna)	0.176***	0.023***	0.024***	0.023***	0.010**	0.031***
	[43.46]	[9.48]	[11.49]	[10.93]	[2.10]	[11.95]
Loss	-0.016***	-0.009	0.010***	0.015***	0.011***	0.006**
	[-3.56]	[-1.52]	[4.99]	[7.56]	[4.67]	[2.26]
Constant	-10.375**	-22.744***	-7.266***	-6.282***	-18.944***	-3.081***
	[-2.56]	[-8.36]	[-9.33]	[-9.39]	[-6.25]	[-4.94]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	914,853	914,853	914,853	914,853	914,853	914,853
R-squared	0.366	0.348	0.352	0.324	0.728	0.323

Table 5: The role of bid-ask spreads

This tables shows whether the bid-ask spread explains the increasing information content of earnings announcements. *Sprd* is the lagged bid-ask spread in year t-1, estimated using daily high and low prices as in Corwin and Schultz (2012). *Sprd1* is the spread in year t, the year of earnings announcements. Definitions of the other variables can be found in Appendix A. Country FE refers to country or region fixed effects. Regression standard errors are clustered by firm and year. The t-values are reported in square brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) *AVAR*	(2) *AVAR*	(3) *AVOL*	(4) *AVOL*	(5) *Sprd1*	(6) *DVAR*	(7) *VAR-ANN*	(8) *VAR-NON*
Year	**0.070*** **	0.103***	**0.019*** **	0.028***	0.003	**0.213*** **	**0.195*** **	**-0.122** **
	[6.85]	[7.90]	**[5.67]**	[7.46]	[0.73]	**[3.88]**	**[3.53]**	**[-2.64]**
*Year*Sprd*		**-0.036*** **		**-0.011*** **				
		[-6.09]		**[-6.56]**				
Sprd	-0.381***	71.060***	-0.065***	21.258***		1.749***	3.564***	7.788***
	[-6.43]	[6.07]	[-3.63]	[6.56]		[4.33]	[7.60]	[9.08]
RptLag	-0.000	-0.000	-0.000	-0.000	0.000	-0.006**	-0.005**	0.005**
	[-1.10]	[-0.98]	[-0.32]	[-0.22]	[1.28]	[-2.74]	[-2.10]	[2.40]
nonDec	-0.051	-0.051	-0.148***	-0.148***	0.017***	-0.190	-0.187	0.054
	[-0.48]	[-0.48]	[-4.84]	[-4.84]	[5.07]	[-0.47]	[-0.44]	[0.17]
Ln(Me)	-0.036***	-0.042***	-0.020***	-0.022***	-0.067***	-0.924***	-1.172***	-1.205***
	[-3.28]	[-3.90]	[-4.49]	[-5.01]	[-13.01]	[-19.18]	[-13.02]	[-6.61]
FS	1.083***	1.101***	0.392***	0.398***	0.088***	4.963***	5.038***	0.244
	[11.70]	[11.82]	[10.17]	[10.24]	[4.38]	[13.57]	[12.61]	[0.75]
Ln(NumAna)	0.063***	0.066***	0.088***	0.089***	0.035***	0.842***	0.900***	0.236**
	[3.71]	[3.90]	[11.63]	[11.62]	[5.15]	[9.10]	[8.79]	[2.54]
AF	0.565***	0.568***	0.207***	0.208***	-0.030***	1.919***	1.934***	-0.134
	[12.79]	[12.85]	[15.90]	[16.26]	[-5.13]	[11.03]	[10.27]	[-1.16]
Guidance	1.056***	1.016***	0.324***	0.311***	-0.041***	3.037***	2.920***	-0.641**

	[7.59]	[7.60]	[7.75]	[7.64]	[-2.93]	[7.47]	[7.08]	[-2.19]
Loss	-0.325***	-0.315***	-0.181***	-0.178***	0.232***	-0.429	0.189	3.657***
	[-10.34]	[-9.77]	[-15.84]	[-15.41]	[14.54]	[-1.49]	[0.83]	[9.39]
VAR-NON							0.819***	
							[14.63]	
Constant	-138.181***	-204.433***	-36.637***	-56.411***	-3.714	-410.341***	-369.477***	269.142***
	[-6.70]	[-7.78]	[-5.56]	[-7.35]	[-0.47]	[-3.70]	[-3.34]	[2.89]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	902,106	902,106	902,106	902,106	910,593	902,106	902,106	902,106
R-squared	0.058	0.059	0.059	0.059	0.270	0.030	0.177	0.297

Table 6: The impact of institutional ownership

This table illustrates the time trend of information content in earnings announcements in relation to institutional ownership. *InstOwn* is the institutional ownership of the stock at the end of the previous quarter. *InstOwn_r* is the rank based on a median binary split of institutional ownership (high vs. low) within each country-quarter. Country FE refers to country or region fixed effects. Regression standard errors are clustered by firm and year. The t-values are reported in square brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	U.S. stocks included			U.S. stocks excluded		
VARIABLES	*InstOwn*	*AVAR*	*AVOL*	*InstOwn*	*AVAR*	*AVOL*
Year	**0.103****	0.058***	0.016***	**0.125*****	0.052***	0.016***
	[2.56]	[5.78]	[4.49]	**[4.07]**	[5.28]	[4.25]
*Year*InstOwn_r*		**0.022*****	**0.006*****		**0.026*****	**0.008*****
		[4.15]	**[3.03]**		**[5.27]**	**[4.38]**
InstOwn_r		-43.872***	-11.251***		-51.831***	-16.154***
		[-4.12]	[-3.01]		[-5.26]	[-4.36]
RptLag	0.001	-0.000	-0.000	0.002*	-0.001*	-0.000
	[0.99]	[-1.13]	[-0.38]	[1.83]	[-1.99]	[-0.64]
nonDec	-0.637***	-0.064	-0.151***	-0.800***	-0.168*	-0.185***
	[-3.94]	[-0.62]	[-4.96]	[-5.97]	[-1.73]	[-5.58]
Ln(Me)	1.364***	-0.032**	-0.023***	1.110***	-0.025*	-0.024***
	[14.73]	[-2.68]	[-5.17]	[9.44]	[-1.98]	[-5.28]
FS	2.438***	1.027***	0.379***	1.813***	0.947***	0.348***
	[4.86]	[11.42]	[10.06]	[5.84]	[10.45]	[8.94]
Ln(NumAna)	3.017***	-0.001	0.070***	2.543***	-0.013	0.064***
	[28.06]	[-0.05]	[9.00]	[35.28]	[-0.72]	[7.74]
AF	1.519***	0.580***	0.211***	1.392***	0.566***	0.203***
	[11.35]	[12.85]	[15.75]	[12.33]	[12.49]	[13.99]
Guidance	6.681***	1.066***	0.325***	1.647***	0.875***	0.249***
	[10.24]	[7.47]	[7.77]	[3.12]	[5.16]	[5.02]
Loss	-1.749***	-0.375***	-0.187***	-1.627***	-0.367***	-0.191***
	[-14.73]	[-10.41]	[-14.89]	[-21.98]	[-8.89]	[-12.86]
Constant	-211.343**	-114.959***	-31.156***	-255.223***	-103.160***	-32.189***
	[-2.60]	[-5.68]	[-4.43]	[-4.12]	[-5.17]	[-4.19]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	912,382	912,382	912,382	842,746	842,746	842,746
R-squared	0.577	0.057	0.059	0.307	0.053	0.051

Table 7: Country-level analyses

This table shows the country-level analyses on the time trend in the information content of earnings announcements. We collapse the dataset to country-quarter levels and use the mean of all the variables within each country-quarter in regression analyses. *Developed* is a dummy variable indicating whether it is a developed market as defined in Bessembinder et al. (2023). *ITR_index_1999* is the insider trading restriction index from the 1999 Global Competitiveness Report as provided in Denis and Xu (2013). *Disclosure_Requirements* and *Public_Enforcement* are two variables on security regulations as provided in La Porta et al. (2006). Per capita GDP, economic growth rates, and inflation rates in the year of earnings announcements are obtained from the World Development Indicators database of the World Bank. Country FE refers to country or region fixed effects. The t-values based on robust standard errors are reported in square brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AVAR	*AVAR*	*AVAR*	*AVAR*	*AVOL*	*AVOL*	*AVOL*	*AVOL*
Year	0.057***	0.043***	-0.053***	0.052***	0.020***	0.016***	0.007	0.037***
	[8.23]	[6.97]	[-2.78]	[4.48]	[11.63]	[8.95]	[1.06]	[9.69]
*Year*Developed*		0.041***				0.010***		
		[5.08]				[3.98]		
*Year*ITR_index_1999*			0.028***				0.004**	
			[5.20]				[2.52]	
*Year*Disclosure_Requirements*				0.047**				-0.018***
				[2.54]				[-3.02]
*Year*Public_Enforcement*				-0.039**				-0.007
				[-2.33]				[-1.31]
RptLag	0.000	0.000	0.000	-0.001*	-0.000***	-0.000***	-0.001***	-0.000*
	[-0.00]	[-0.28]	[0.15]	[-1.70]	[-2.58]	[-2.92]	[-2.79]	[-1.71]
nonDec	-0.186***	-0.203***	-0.082	-0.100*	-0.176***	-0.180***	-0.154***	-0.156***
	[-3.47]	[-3.76]	[-1.29]	[-1.88]	[-10.79]	[-11.06]	[-9.09]	[-8.85]
Ln(Me)	-0.004	-0.033	-0.06	-0.012	-0.027**	-0.034***	-0.042***	-0.035**
	[-0.10]	[-0.92]	[-1.52]	[-0.30]	[-2.17]	[-2.74]	[-3.12]	[-2.56]

FS	0.074	0.052	0.409	-0.038	0.173	0.167	0.167	0.189
	[0.25]	[0.18]	[1.44]	[-0.12]	[1.64]	[1.59]	[1.50]	[1.52]
Ln(NumAna)	-0.033	0.012	0.057	-0.107	-0.03	-0.019	-0.001	0.016
	[-0.41]	[0.15]	[0.63]	[-1.46]	[-1.12]	[-0.72]	[-0.03]	[0.51]
AF	0.866***	0.807***	0.759***	1.086***	0.253***	0.239***	0.235***	0.256***
	[3.65]	[3.47]	[3.19]	[4.27]	[3.74]	[3.52]	[3.31]	[3.43]
Guidance	1.728***	1.168***	0.994**	1.330***	0.589***	0.456***	0.469***	0.452***
	[5.12]	[3.16]	[2.52]	[3.62]	[6.58]	[4.70]	[4.59]	[4.51]
Loss	-0.676***	-0.793***	-1.016***	-0.808***	-0.244***	-0.272***	-0.295***	-0.300***
	[-3.07]	[-3.65]	[-4.06]	[-3.14]	[-3.51]	[-3.87]	[-3.65]	[-3.71]
GDP_perCapita	0	0	-0.000**	0	0	-0.000*	-0.000**	0
	[0.19]	[-1.39]	[-2.16]	[-0.78]	[-0.47]	[-1.69]	[-2.13]	[-0.47]
GDPgrowth	0.011*	0.011	0.009	0.005	0	0	0.001	0
	[1.70]	[1.61]	[1.13]	[0.59]	[0.24]	[0.17]	[0.48]	[-0.16]
Inflation	0	0	0	0	-0.000*	0	-0.000*	-0.000**
	[-0.64]	[-0.01]	[-0.44]	[-0.59]	[-1.65]	[-1.09]	[-1.66]	[-2.02]
Constant	-109.986***	-164.084***	-207.077***	-121.928***	-38.396***	-51.233***	-54.875***	-24.338***
	[-8.19]	[-8.20]	[-7.49]	[-4.75]	[-11.69]	[-10.94]	[-8.89]	[-3.86]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.337	0.344	0.400	0.437	0.375	0.378	0.417	0.432
Number of Observations	4856	4856	3909	3591	4856	4856	3909	3591

Table 8: Robustness tests

This table presents the results of several robustness tests. Panel A demonstrates that the findings remain consistent when the information content variables are log-transformed. The new variable *AVOL2* represents an alternative measure of information content based on trading volume, calculated as the average trading volume in the window [-1, 1] divided by the average trading volume in the window [-120, -6]. Panel B indicates that the results are statistically significant for both quarterly and annual earnings announcements. Panel C confirms that the results remain robust when controlling for firm fixed effects. Country FE refers to country or region fixed effects. The regression standard errors are clustered by firm and year. The t-values are provided in square brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Log-transformation of the measures of information content

	(1)	(2)
VARIABLES	Ln (*AVAR*)	Ln (*AVOL2*)
Year	**0.023*** **	**0.014*** **
	[6.69]	**[6.24]**
RptLag	-0.001***	-0.000*
	[-3.21]	[-1.95]
nonDec	-0.055	-0.111***
	[-1.56]	[-5.06]
Ln(Me)	0.020***	-0.003
	[4.86]	[-0.90]
FS	0.385***	0.257***
	[12.68]	[12.38]
Ln(NumAna)	0.075***	0.085***
	[7.74]	[13.87]
AF	0.234***	0.120***
	[12.52]	[15.15]
Guidance	0.294***	0.106***
	[7.45]	[5.02]
Loss	-0.172***	-0.161***
	[-11.68]	[-22.89]
Constant	-47.010***	-27.361***
	[-6.78]	[-6.26]
Country FE	Yes	Yes
Observations	914,853	914,755
R-squared	0.073	0.078

Panel B: Quarterly and annual earnings announcements

	(1)	(2)	(3)	(4)
	Quarterly		Annual	
VARIABLES	*AVAR*	*AVOL*	*AVAR*	*AVOL*
Year	**0.021*** **	**0.016*** **	**0.028*** **	**0.014*** **
	[5.20]	**[7.34]**	**[7.10]**	**[4.25]**
RptLag	-0.001***	-0.000	-0.000	-0.001*
	[-5.08]	[-1.17]	[-1.52]	[-1.86]
nonDec	-0.034	-0.044	0.006	-0.025
	[-0.91]	[-1.14]	[0.16]	[-0.91]
Ln(Me)	0.013**	-0.003	0.033***	-0.002
	[2.39]	[-0.66]	[7.59]	[-0.60]
FS	0.344***	0.212***	0.345***	0.204***
	[10.40]	[9.61]	[8.70]	[7.96]
Ln(NumAna)	0.085***	0.085***	0.048***	0.075***
	[6.79]	[11.71]	[4.80]	[7.77]
AF	0.236***	0.130***	0.235***	0.131***
	[12.96]	[13.88]	[7.01]	[7.72]
Guidance	0.230***	0.050**	0.252***	0.106**
	[5.27]	[2.69]	[3.26]	[2.46]
Loss	-0.155***	-0.168***	-0.202***	-0.165***
	[-7.25]	[-20.70]	[-15.62]	[-12.95]
Constant	-42.877***	-33.006***	-57.328***	-28.220***
	[-5.28]	[-7.36]	[-7.21]	[-4.27]
Country FE	Yes	Yes	Yes	Yes
Observations	559,956	559,956	283,682	283,682
R-squared	0.061	0.073	0.076	0.069

Panel C: Control for firm fixed effects

VARIABLES	(1) *AVAR*	(2) *AVOL*
Year	**0.084***** **[7.00]**	**0.028***** **[9.18]**
RptLag	-0.000 [-1.47]	-0.000 [-0.28]
nonDec	-0.180* [-1.77]	-0.201*** [-5.77]
Ln(Me)	-0.001 [-0.01]	-0.091*** [-9.16]
FS	0.265* [1.93]	0.312*** [3.35]
Ln(NumAna)	-0.059* [-1.83]	0.021** [2.20]
AF	0.506*** [11.55]	0.180*** [14.60]
Guidance	0.719*** [5.19]	0.189*** [4.55]
Loss	-0.212*** [-4.96]	-0.167*** [-17.01]
Constant	-167.208*** [-6.88]	-55.113*** [-8.76]
Firm FE	Yes	Yes
Observations	912,533	912,533
R-squared	0.140	0.140

Panel D: Use an annual sample that can go back to 1995

	(1)	(2)	(3)	(4)
VARIABLES	*AVAR*	*AVOL*	*AVAR*	*AVOL*
Year	**0.070*** **	**0.023*** **	**0.082*** **	**0.024*** **
	[8.33]	**[6.72]**	**[8.62]**	**[6.25]**
RptLag	-0.001**	-0.000**	-0.000	-0.000*
	[-2.43]	[-2.26]	[-1.07]	[-2.05]
nonDec	0.459***	0.062	0.052	-0.005
	[3.74]	[1.56]	[0.43]	[-0.15]
LnMe	-0.049***	-0.023***	-0.011	-0.015**
	[-2.81]	[-4.06]	[-0.54]	[-2.27]
FS	0.388***	0.218***	0.953***	0.278***
	[3.56]	[4.58]	[8.34]	[7.21]
Ln(NumAna)	0.135***	0.122***	0.033	0.088***
	[5.64]	[11.57]	[1.37]	[7.01]
AF	0.736***	0.222***	0.455***	0.183***
	[8.37]	[7.58]	[6.16]	[7.42]
Guidance	1.194***	0.236***	1.023***	0.281***
	[4.87]	[3.43]	[3.99]	[4.02]
Loss	-0.397***	-0.168***	-0.596***	-0.212***
	[-8.31]	[-7.45]	[-10.61]	[-8.53]
Constant	-138.209***	-46.187***	-163.365***	-46.839***
	[-8.18]	[-6.63]	[-8.48]	[-6.19]
Country FE	No	No	Yes	Yes
Observations	338,137	338,137	338,137	338,137
R-squared	0.044	0.037	0.059	0.048

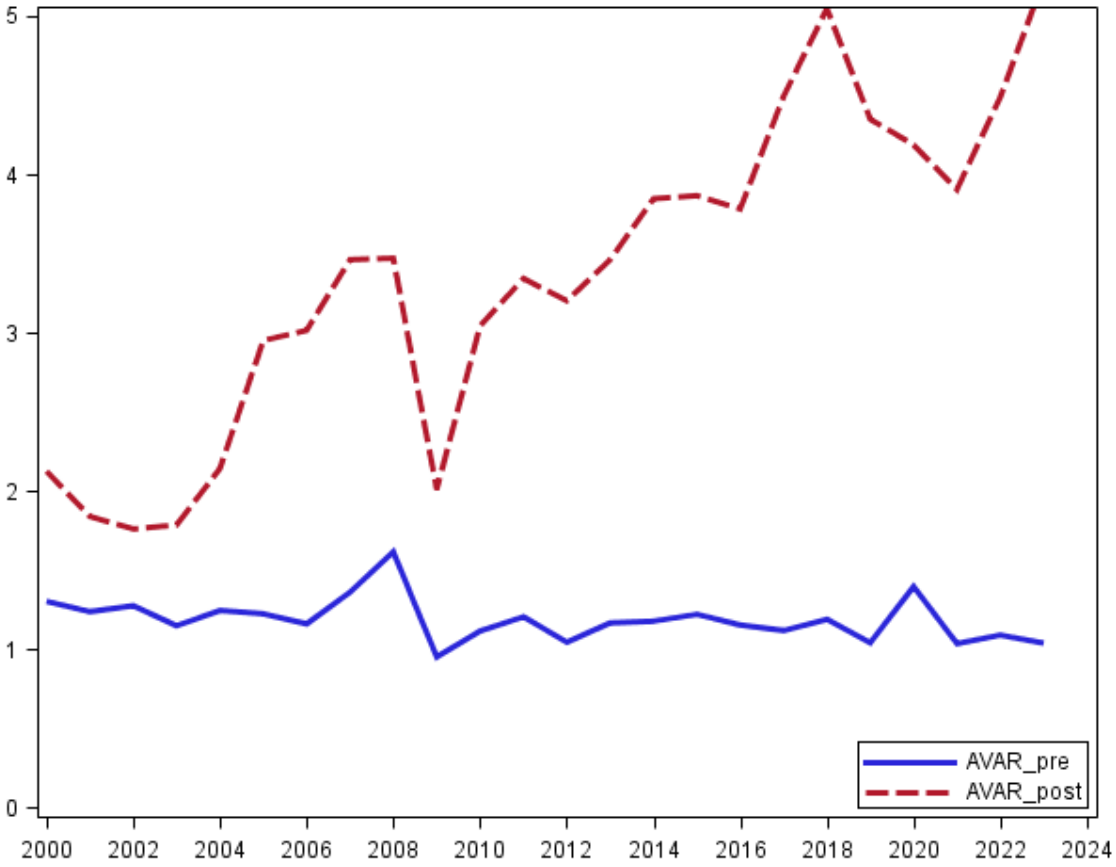
Internet Appendix

The Internet Appendix contains **one** figure and **three** tables as listed below.

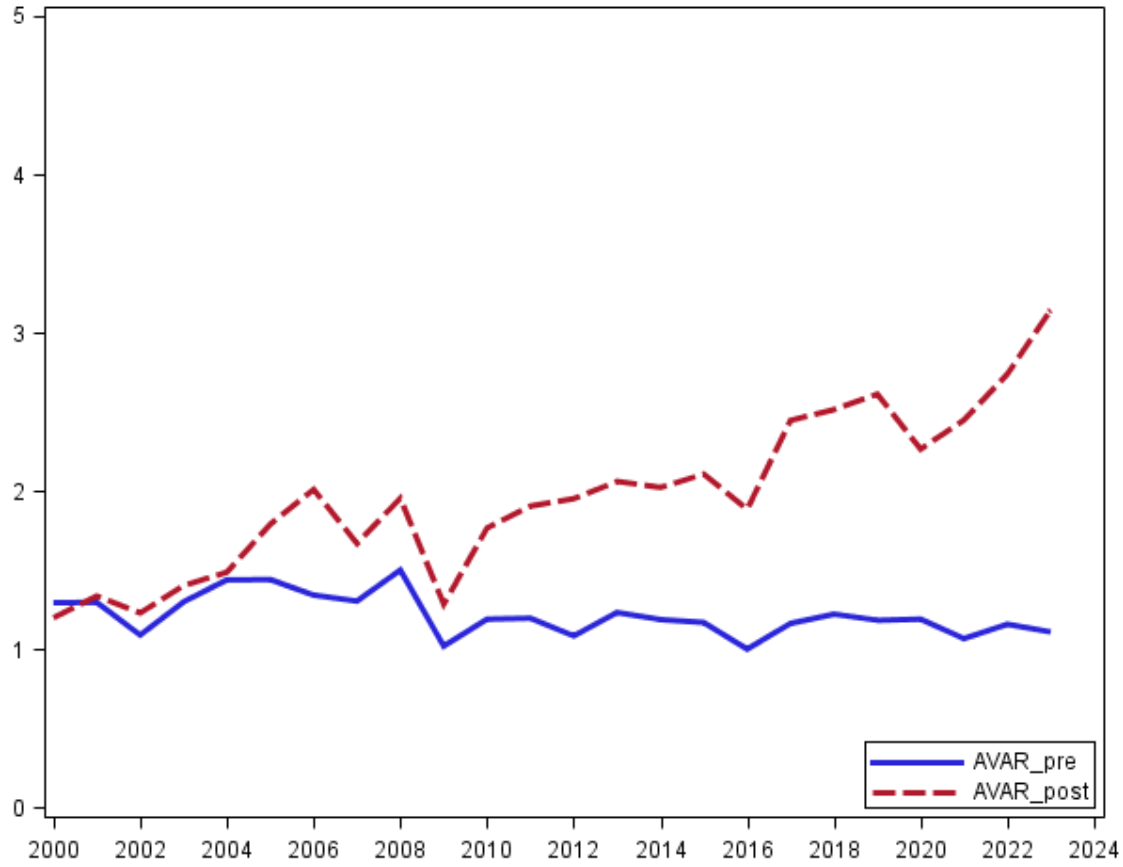
- Figure IA-1: Pre-announcement vs. post-announcement information by market maturity
- Table IA-1: Mean *AVAR* and *AVOL* by country/region
- Table IA-2: Pearson correlations
- Table IA-3: Time trend and firm size

Figure IA-1: Pre-announcement vs. post-announcement information by market maturity
The information content of earnings announcements is measured separately using pre-announcement or post-announcement trading data. The pre-announcement period refers to the window [-5, -1] relative to the announcement date, and the post-announcement period refers to the window [0, 1]. *AVAR_pre* is the return variance-based measure of information using pre-announcement data, while *AVAR_post* is the return variance-based measure of information using post-announcement data. *AVOL_pre* is the trading volume-based measure of information using pre-announcement data, while *AVOL_post* is the trading volume-based measure of information using post-announcement data. The annual average information content before and after earnings announcements is plotted. Panels A and B show the results of return variance-based measures for developed and developing markets, respectively. Panels C and D show the results of trading volume-based measures for developed and developing markets, respectively.

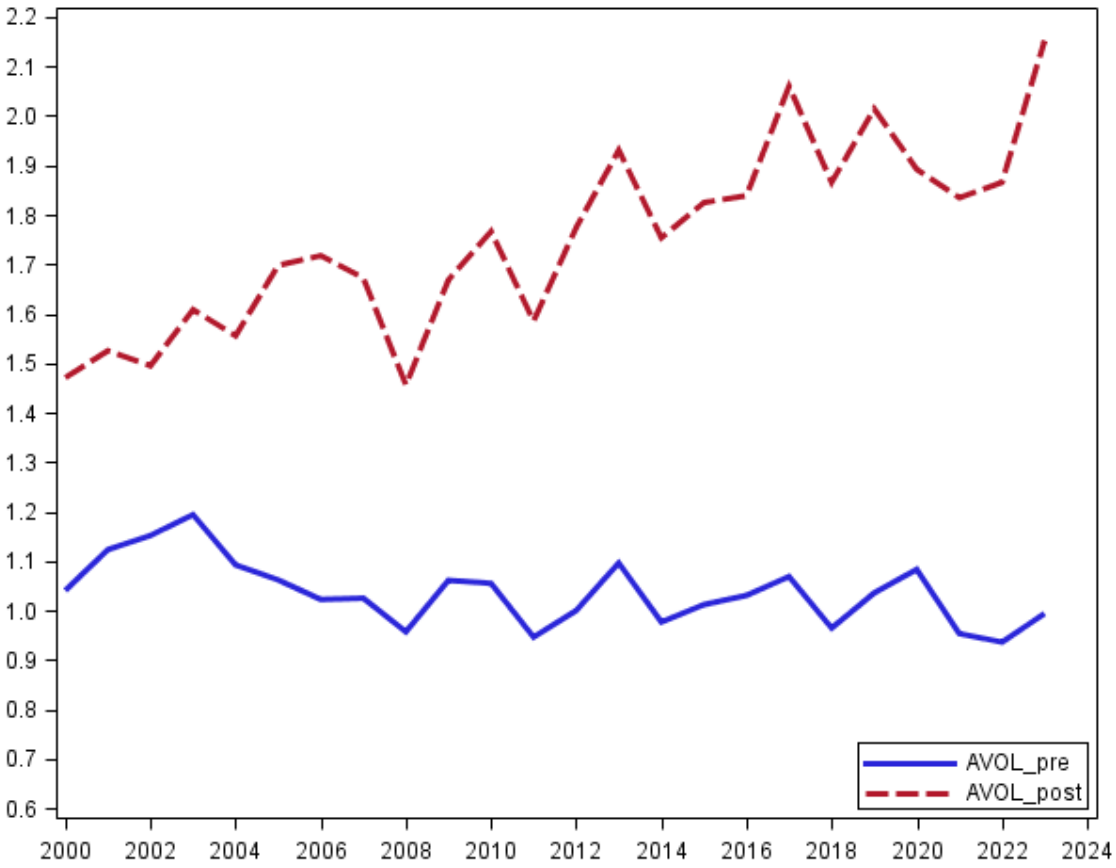
Panel A: Pre- vs. post-announcement AVAR for developed markets



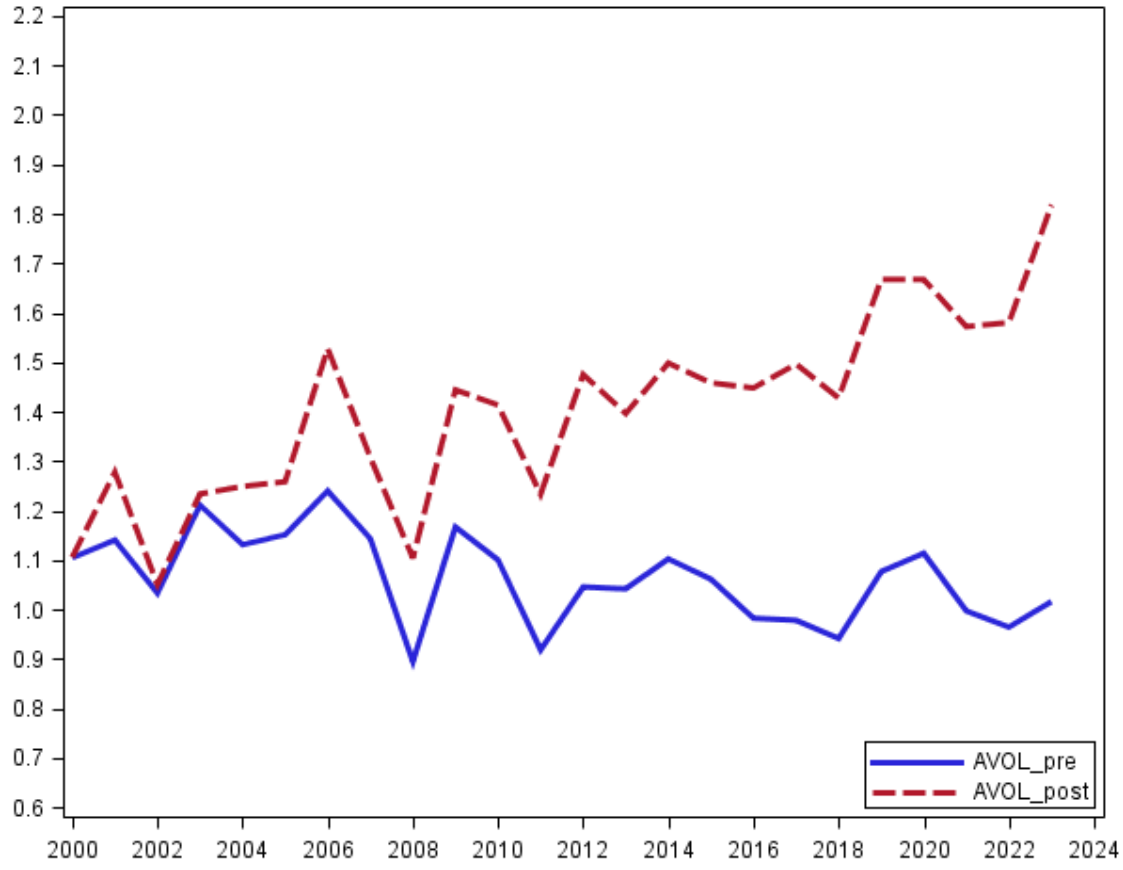
Panel B: Pre- vs. post-announcement AVAR for developing markets


5
4
3
2
1
0
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
AVAR_pre
AVAR_post

Panel C: Pre- vs. post-announcement AVOL for developed markets



Panel D: Pre- vs. post-announcement AVOL for developing markets


2.2
2.1
2.0
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2020
2022
2024
AVOL_pre
AVOL_post

Table IA-1: Mean *AVAR* and *AVOL* by country/region

This table displays the mean, standard deviation, and median of *AVAR* and *AVOL* for each country/region in our sample. The sample comprises 75 countries or regions and covers the period from 2000 to 2023. *AVAR* and *AVOL* represent abnormal return variance and abnormal trading volumes around earnings announcements, respectively.

			AVAR			*AVOL*		
No.	Country/Region	Nobs	Mean	Std	Median	Mean	Std	Median
1	Argentina	2513	1.66	3.27	0.79	0.18	1.13	0.79
2	Australia	23422	2.94	4.89	1.17	0.67	1.51	1.17
3	Austria	3173	2.20	3.69	1.01	0.45	1.23	1.01
4	Belgium	4783	2.93	4.75	1.17	0.80	1.56	1.17
5	Brazil	11511	1.95	3.13	0.98	0.47	1.19	0.98
6	Canada	1579	2.06	4.25	0.80	0.34	1.21	0.80
7	Chile	3743	1.60	2.95	0.76	0.16	1.00	0.76
8	China	133333	1.80	3.17	0.78	0.33	1.34	0.78
9	Croatia	987	1.86	3.22	0.79	0.16	1.00	0.79
10	Cyprus	253	1.34	2.02	0.72	0.07	1.07	0.72
11	Denmark	6007	3.25	4.92	1.41	0.93	1.60	1.41
12	Egypt	4849	1.51	2.87	0.61	0.22	1.26	0.61
13	Finland	8300	3.70	5.31	1.74	0.99	1.64	1.74
14	Germany	26827	2.27	3.79	0.97	0.58	1.36	0.97
15	Greece	4888	1.43	2.47	0.69	0.12	1.12	0.69
16	Hong Kong	25040	2.68	4.27	1.18	0.68	1.54	1.18
17	Hungary	910	1.71	2.96	0.80	0.31	1.20	0.80
18	India	61905	2.38	3.90	1.09	0.66	1.61	1.09
19	Indonesia	10780	1.67	3.20	0.68	0.29	1.28	0.68
20	Ireland	874	2.52	4.03	1.19	0.53	1.28	1.19
21	Israel	4906	2.15	3.48	1.07	0.40	1.16	1.07
22	Italy	14617	2.17	3.70	0.93	0.61	1.47	0.93
23	Japan	138100	3.37	5.37	1.33	0.79	1.65	1.33
24	Jordan	1880	1.42	2.45	0.72	0.17	1.13	0.72
25	Kuwait	3191	1.79	3.52	0.74	0.21	1.19	0.74
26	Lithuania	611	1.83	3.22	0.77	0.23	1.06	0.77
27	Luxembourg	99	1.46	1.89	0.74	-0.04	0.54	0.74
28	Malaysia	39359	1.94	3.59	0.76	0.40	1.45	0.76
29	Mexico	5242	1.85	3.27	0.84	0.20	1.02	0.84
30	Morocco	1302	1.88	3.13	0.83	0.15	1.10	0.83
31	Netherlands	4657	3.77	5.59	1.59	1.05	1.62	1.59
32	New Zealand	2685	2.95	4.61	1.29	0.56	1.39	1.29
33	Norway	11399	2.53	4.06	1.15	0.62	1.42	1.15
34	Oman	2165	2.23	3.88	0.78	0.24	1.17	0.78
35	Pakistan	6746	1.84	2.47	1.01	0.41	1.38	1.01
36	Peru	1111	1.51	2.44	0.67	0.08	0.93	0.67

37	Philippines	5930	1.37	2.54	0.60	0.13	1.09	0.60
38	Poland	14305	2.04	3.61	0.87	0.39	1.31	0.87
39	Portugal	1941	1.81	2.88	0.88	0.40	1.20	0.88
40	Qatar	1456	2.42	4.40	0.89	0.45	1.40	0.89
41	Romania	1749	1.67	3.05	0.72	0.20	1.07	0.72
42	Russia	3382	1.61	3.30	0.63	0.25	1.18	0.63
43	Saudi Arabia	6001	2.48	4.04	1.04	0.45	1.33	1.04
44	Singapore	15502	2.07	3.46	0.94	0.51	1.43	0.94
45	Slovenia	639	1.77	3.52	0.68	0.21	1.11	0.68
46	South Africa	6578	2.13	3.43	1.01	0.40	1.19	1.01
47	South Korea	45052	1.92	3.57	0.80	0.43	1.51	0.80
48	Spain	7101	1.96	3.28	0.90	0.29	1.13	0.90
49	Sri Lanka	4374	1.69	3.19	0.71	0.21	1.20	0.71
50	Sweden	18444	3.91	5.70	1.70	0.96	1.63	1.70
51	Switzerland	7293	3.25	5.05	1.35	0.85	1.54	1.35
52	Taiwan	56969	1.77	3.20	0.73	0.27	1.35	0.73
53	Thailand	16251	2.24	4.04	0.89	0.37	1.33	0.89
54	Tunisia	1304	1.50	2.63	0.69	0.14	1.12	0.69
55	Turkey	10595	1.87	3.35	0.80	0.32	1.28	0.80
56	United Arab Emirates	2266	1.62	2.80	0.76	0.28	1.23	0.76
57	United Kingdom	44338	3.61	5.75	1.33	0.71	1.50	1.33
58	United States	69636	3.90	7.01	1.45	0.99	1.63	1.45
All		914853	2.54	4.51	1.00	0.56	1.49	1.00

Table IA-2: Pearson correlations

This table shows the Pearson correlation coefficient between the main variables in our sample. The definitions of the variables can be found in Appendix A of the main manuscript. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	*AVAR*	*AVOL*	*RptLag*	*nonDec*	*Ln(Me)*	*FS*	*Ln(NumAna)*	*AF*	*Guidance*	*Loss*	*Sprd*
AVAR	1.000										
AVOL	0.545***	1.000									
RptLag	-0.038***	-0.039***	1.000								
nonDec	-0.019***	-0.052***	-0.125***	1.000							
Ln(Me)	0.049***	0.066***	-0.163***	-0.034***	1.000						
FS	0.047***	0.047***	-0.038***	-0.152***	0.101***	1.000					
Ln(NumAna)	0.077***	0.114***	-0.150***	-0.044***	0.693***	0.101***	1.000				
AF	0.141***	0.154***	-0.118***	0.014***	0.321***	0.028***	0.480***	1.000			
Guidance	0.162***	0.152***	-0.108***	0.003***	0.115***	0.071***	0.163***	0.406***	1.000		
Loss	-0.031***	-0.052***	0.092***	-0.064***	-0.234***	0.033***	-0.161***	-0.095***	-0.040***	1.000	
Sprd	-0.043***	-0.029***	0.075***	-0.061***	-0.207***	0.040***	-0.119***	-0.130***	-0.109***	0.222***	1.000

Table IA-3: Time trend and firm size

This table examines whether firm size can drive significant variations in the trend of rising information content of earnings announcements. *AVAR* and *AVOL* are two measures of information content, and the two suffixes (pre and post) indicate pre-announcement and post-announcement information, respectively. *Me* is firm size as measured by the market capitalization of the firm. Country FE refers to country or region fixed effects. Regression standard errors are clustered by firm and year. The t-values are reported in square brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	*AVAR*	*AVAR_pre*	*AVAR_post*	*AVOL*	*AVOL_pre*	*AVOL_post*
Year	0.025	-0.003	0.022	0.024**	-0.003	0.079***
	[1.24]	[-0.34]	[0.82]	[2.11]	[-0.29]	[5.01]
*Year*LnMe*	0.002*	-0.000	0.004***	-0.000	-0.000	-0.003***
	[2.05]	[-0.56]	[3.03]	[-0.54]	[-0.15]	[-3.87]
RptLag	-0.000	0.000	-0.000	-0.000	0.000***	-0.000
	[-1.03]	[0.50]	[-0.76]	[-0.07]	[3.98]	[-1.57]
nonDec	-0.062	-0.074	-0.051	-0.150***	-0.104***	-0.147***
	[-0.60]	[-1.61]	[-0.40]	[-4.94]	[-5.16]	[-4.31]
LnMe	-4.321*	0.539	-8.500***	0.583	0.126	5.148***
	[-2.05]	[0.55]	[-3.03]	[0.52]	[0.13]	[3.79]
FS	1.035***	0.045	1.428***	0.382***	0.030	0.493***
	[11.37]	[1.58]	[10.85]	[10.12]	[1.22]	[11.19]
Ln(NumAna)	0.043**	-0.022***	0.087***	0.083***	0.007	0.077***
	[2.45]	[-2.91]	[3.39]	[10.42]	[1.23]	[8.18]
AF	0.582***	0.039***	0.762***	0.211***	0.010	0.230***
	[12.98]	[3.16]	[11.85]	[15.81]	[1.14]	[16.06]
Guidance	1.084***	-0.103***	1.640***	0.329***	0.005	0.225***
	[7.49]	[-2.90]	[8.53]	[7.80]	[0.26]	[6.01]
Loss	-0.393***	-0.023*	-0.517***	-0.192***	-0.026***	-0.281***
	[-10.95]	[-1.91]	[-10.43]	[-14.98]	[-5.14]	[-16.16]
Constant	-47.819	7.424	-43.407	-47.240**	7.659	-155.881***
	[-1.19]	[0.42]	[-0.79]	[-2.08]	[0.35]	[-4.90]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	914,853	914,853	914,849	914,853	913,888	912,625
R-squared	0.056	0.004	0.067	0.058	0.006	0.048