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When Hollywood movies steal the show, stock returns dance more with the market!

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ABSTRACT

Hollywood film releases attract U.S. investors' attention away from the financial markets. This is reflected in lower trading activity and abnormal Google search volume for firm names between film and non-film days. The resultant investor inattention leads to a significantly higher stock return comovement with the market on film release days. Interestingly, films with A-list star actors and blockbuster movies exhibit a more pronounced impact than their counterparts. Finally, we show that being aware of this Hollywood film-induced mispricing can yield an annualized abnormal risk-adjusted return of up to 13.5% within five days around the release events.

"*Movies absorb our attention more completely, I think*", Roger Ebert.[1]

1. Introduction

Avatar, the epic science fiction film directed by James Cameron, was released on December 18, 2009, and went on to break numerous key box office records, including the all-time highest-grossing film ($2.8 billion), the highest opening weekend grossing film ($242 million), and the fastest to $1 billion film (within 28 days). According to Google Zeitgeist, the film was among the top five most popular online search queries for movies in 2009 and was a salient world-wide entertainment event which grabbed sheer attention from the public and media.

This paper investigates whether the Hollywood film releases attract investors' attention and hence drive it away from the financial markets. Specifically, we consider daily events of film releases over the period 1980–2019 as exogenous shocks to investor attention based on the premise that, film releases are large nationwide events that can plausibly distract investors' attention and trading in the equity markets, and film releases are not confounded with firms' fundamental characteristics.[2] Several factors concurrent with market hours can capture investor attention towards film releases. For example, media coverage and social conversations among friends and colleagues, fueled by eager anticipation of the movie, can be significant. This effect may intensify if the film boasts features that predict its success, such as the involvement of A-list actors or its blockbuster status. Our empirical analyses, as we will detail, corroborate these expectations.

The recent theoretical research (e.g., Peng & Xiong, 2006; Veldkamp, 2006; Veldkamp & Wolfers, 2007) employs the framework of investor

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[1] See, https://en.wikipedia.org/wiki/Roger_Ebert, https://www.brainyquote.com/quotes/roger_ebert_361725

[2] Investor attention plays an important theoretical role in the acquisition and pricing of information in the financial markets. Prior empirical studies also document that investor attention to firm-specific information events is associated with the quality of security price discovery and liquidity (e.g., Blankespoor, deHaan, & Zhu, 2018; Bushee, Core, Guay, & Hamm, 2010; Drake, Roulstone, & Thornock, 2012; Hirshleifer, Lim, & Teoh, 2009).

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attention to explicate the comovement of asset prices. These studies suggest that when the overall investors' attention is fascinated away from the financial markets, investors tend to pay disproportionately more attention to market-wide information than firm-specific information, resulting in stock returns to comove more with the market.[3] We hypothesize that investor attention to the financial markets is lower and stock return comovement with the market is higher on days when films are released.[4]

Our study contributes to the literature that links rational inattention to phenomena in the financial markets. The pioneering work by Peng and Xiong (2006) introduces a framework of rational inattention to explain puzzling asset pricing phenomena. Later studies employ this rational inattention to explain home bias (Nieuwerburgh & Veldkamp, 2009) and under-diversification (Nieuwerburgh & Veldkamp, 2010). However, empirical study that links investor inattention to return comovement faces a challenge of identifying attention-grabbing shocks that are exogenous to firms since the shock needs to be of nationwide interest, and does not confound with firms' fundamentals (see, Huang, Huang, & Lin, 2019). There have been a few shocks introduced in previous empirical studies. For example, Huang et al. (2019) employ the large lottery jackpots in Taiwanese stock market, which is later applied in Chinese stock market by Zhaunerchyk, Haghighi, and Oliver (2020), and Hu, Li, Goodell, and Shen (2021). Besides, Ehrmann and Jansen (2022) use FIFA World Cup soccer matches as exogeneous shocks that distract investor's attention. Considering that the distraction effect is more prominent among retail investors (Peress & Schmidt, 2020), and retail investors are attracted to stocks with characteristics resembling lotteries (Kumar, 2009), it is reasonable to expect that major lottery events (e.g., Huang et al., 2019) will divert the attention of retail investors from their stock investments, leading to mispricing. Although these events are exogenous from the market's information channel perspective, they may be endogenous to retail investors' decision-making, influenced by factors such as their inclination towards gambling. This also pertains to events like the FIFA World Cup, a shock used by Ehrmann and Jansen (2022), where the betting industry plays a significant role. We content that Hollywood film releases are exogenous to financial markets and investors' decision-making processes because film releases are primarily dictated by factors such as production schedules, budget considerations, marketing strategies, competitive landscape, and movie-going trends, rather than considerations related to stock market activity or investor investment. In addition, there is no prior evidence suggesting that retail investors' gambling preferences should be connected with film releases. Therefore, exploring whether the link between attention and return comovement persists with shocks that are genuinely exogenous to investors' decision-making could provide meaningful insights.[5] Our study is novel in providing significant evidence that Hollywood film releases serve as a distinctive shock for testing the investor attention theory within the U.S. stock market. This novel shock, characterized by its unique set of attributes, allows for a richer understanding of how investor's attention is consistently diverted across various scenarios, including films featuring A-list stars as well as those without, on days with single or multiple releases, and in blockbuster compared to non-blockbuster movies.

Our study also adds to another stream of literature on style investing and return comovement. Due to limited cognitive and attentional capacity to process information for multiple stocks, investors tend to allocate them into different groups by style characteristics and then trade them together, inducing return comovements among the investment groups (Barberis & Shleifer, 2003; Barberis, Shleifer, & Wurgler, 2005; Boyer, 2011; Cathcart, Jahel, Evans, & Shi, 2019; Grullon, Underwood, & Weston, 2014; Hameed & Xie, 2019; Kumar, 2009; Pirinsky & Wang, 2006). We differentiate our study from previous studies by linking investors' attention to the stock return comovement with the market. Specifically, we show that Hollywood film release events are exogenous shocks that draw investors' attention away from the financial markets, leading stock returns to comove more with the markets.[6]

To empirically test our main hypothesis, we collect all film releases from five major studios in Hollywood: Universal, Paramount Pictures, Warner Bros., Walt Disney, and Sony Pictures, as these studios have long been recognized as the symbols of the U.S. film industry.[7] We source data from The Numbers, a data provider that keeps records of the business information on films and maintains the most extensive database serving the film industry professionals, the investment community, and fans. We then consider days with Hollywood film releases, called film days, as 'distraction events' and investigate if investor attention to the financial markets is affected. We identify 1153 film days over the period 1980–2019, accounting for 11.43% of the total trading days from the CRSP database over the same period. We first document that the overall share turnover and Google Search Volume Index (SVI) for S&P 500 firm names are significantly lower on film days than on non-film release days. Next, we document a spiking trend in that the SVI for the keyword 'Hollywood' term is higher on film days. Collectively, our initial evidence suggests that investors' attention to Hollywood films is heightened while investors' trading activities are relatively quieter during Hollywood film release time.

We next test whether investor distraction surrounding Hollywood film releases as above leads to higher stock return comovement with the market. Following the literature (e.g., Anton & Polk, 2014; Barberis et al., 2005; Huang et al., 2019), we capture stock return comovement with the market in two different ways. First, we measure the Pearson correlation coefficient between stock excess return and market excess return. The higher the correlation, the stronger stock return comovement with the market is. Second, we examine the adjusted R-squared from the market model regressions, where we regress individual stock returns against the CRSP value-weighted index return. Studies such as Morck, Yeung, and Yu (2000) and Durnev, Morck, and Yeung (2004) suggest that the adjusted R-squared from the market model reflects firm-specific information in stock returns, where higher R-squared indicates more (less) market (firm-specific) shock in stock returns. We construct these measures of stock return comovement with the market on film

[3] Because investor attention is a scarce cognitive resource and investors are only capable of processing a subset within all available information due to limits in attention and capacity (see, e.g., Hong & Stein, 1999; Hirshleifer & Teoh, 2003; Peng & Xiong, 2006), film releases, as distracting events, can result in a disproportional higher attention allocation to market-wide information, and hence higher stock return comovement with the market.

[4] A growing body of literature has found that investor attention oscillates and significantly affects asset prices (e.g., Andrei & Hasler, 2015; Cardillo, Onali, & Perdichizzi, 2023; Da et al., 2011; Huberman & Regev, 2001; Xu, Liu, Hu, & Guo, 2022; Zhu, Sun, Yung, & Chen, 2020). For instance, Barber and Odean (2008), Barber, Odean, and Zhu (2009) find that the high level of investor attention to the financial markets can place high pressure on buying activities and swift price reactions. Dellavigna and Pollet (2009) find that the low level of investor attention, in contrast, causes an underreaction to earnings announcements.

[5] We are grateful to an anonymous referee for this insightful suggestion.

[6] Several studies find that investors are attracted away from the financial market around popular events and news. For example, Peress and Schmidt (2020) use sensational news on TV as exogenous shocks to noise traders' attention and find that trading activities, market volatility and liquidity decrease, and prices reverse less among stocks held pre-dominantly by noise traders on "distraction days". Savor and Wilson (2014) find that investors are distracted by important macroeconomic news, which causes stock market beta to be significantly associated with average returns.

[7] Fig. 1 shows that these film studios accounted for 76% of the market share, according to the statistics in 2019. Specifically, Walt Disney was ranked 1st with 33.5% of market share, followed by Warner Bros., Sony Pictures and Universal with 13.9%, 12.1% and 11.5%, respectively. Hence, we argue that investors are potentially attracted away from the financial markets around the film release events by these studios.

days and non-film days separately and then examine the differences of stock return comovement for each firm.

Our main empirical analysis is straightforward and can be summarized as follows. We find that stock return comovement with the market is significantly higher on film days than on non-film days. The mean and median differences in the correlation coefficients between film days and non-film days are 0.008 and 0.032, respectively, and these differences are statistically significant at the 1% level. The economic magnitudes of these differences are also large, with the mean (median) correlation being 4.6% (22.9%) higher on film days than non-film days. Similarly, the mean and median of the difference in the adjusted R-squared are 0.035 and 0.018, respectively. These differences are also statistically significant at the 1% level. The mean (median) adjusted R-squared is 67.3% (90%) higher on film days than non-film days. To test which factor causes changes in correlation coefficients, we decompose the change into change in covariance, and market and stock return volatilities, and we find that changes in correlation coefficients are primarily driven by changes in covariance. These results are consistent with our main hypothesis that individual stock returns comove with the market significantly more on film days when investors' attention to the financial markets subsides.

We next investigate whether Hollywood film release events have a spillover effect on return comovement on trading days surrounding the release event. Specifically, we identify non-film days as spillover days if they are one or two trading days immediately before and after film days. Consistent with a spillover effect, we find that stock return comovement with the market increases gradually on the preceding spillover days and then peaks on the Hollywood film release day before gradually decreasing on the following spillover days.

We conduct several tests to confirm that our results are not driven by seasonality and weekend effects. We first introduce two tests to isolate possible seasonality effects. We add a series of month dummies into the market model to estimate the adjusted R-squared. We show that the adjusted R-squared after controlling for monthly seasonality effects is still higher on film days than on non-film days. Next, we regress a dummy variable for film month (i.e., the variable taking value one if at least one Hollywood film is released in the month and zero otherwise), on the adjusted R-squared obtained from the market model regressions within each month for each firm. The positive estimated coefficient of the dummy variable, Hollywood film, shows that the adjusted R-squared is consistently higher on Hollywood film months than on non-Hollywood film months after controlling for differences across month time. We second test whether our findings are distinct from the weekend effects. We divide Hollywood film days into the weekend and non-weekend film days and then replicate the main analysis. We find that there is no significant difference in stock return comovement with the market between weekend and non-weekend film days, and stock return comovement is still significantly higher on film days than on non-film days.

We next document several further interesting findings. First, we categorize Hollywood film days into multiple film and single film days by the number of films being simultaneously released on the same day. We find that stock return comovement with the market is higher on multiple film days than on single film days, consistent with the notion that multiple film days are higher distraction days. Second, we consider whether movies had A-list star actors in their cast. We find a significantly higher stock return comovement with the market during the release days of movies with A-list stars compared to those without. This result is consistent with the wide media coverage and public attention for movies with A-list star actors. Third, we identify blockbuster film days based on total revenue, initial revenue, initial tickets, and the production budget of films in our sample. We find that stock return comovement with the market is especially high on blockbuster film days. This finding is intuitive because blockbuster films tend to be covered widely by the media, and any distraction effect on the financial markets should be sizeable.

We further show that being aware of the Hollywood film-induced mispricing can be significantly paid off. To illustrate, we construct a trading strategy to benefit from the potential stock mispricing because of increased (decreased) attention to market-wide (firm-idiosyncratic) information surrounding Hollywood firm release events. For each Hollywood firm release event, we estimate the "additional" sensitivity of a stock's returns to Hollywood firm releases using one-year past data before the event. We define this additional sensitivity as the Hollywood beta, which is an amount of beta that exceeds the stock beta measured on non-film days. We then split the Hollywood beta of each stock depending on whether the market price increased or decreased on the release days. Considering two similar stocks, stock A and B, in which, stock A has an insignificant Hollywood beta while stock B has a significant one. We conjecture that stock B tends to be overpriced (underpriced) if the market increases (decreases) on Hollywood film release days. That being said, stock B tends to suffer from the mispricing induced by Hollywood film releases while stock A does not. We define the Hollywood beta of stock B (A) as an "overpriced" ("underpriced") beta accordingly. After separating the Hollywood beta into the overpriced and underpriced groups, we divide each group into five portfolios based on their beta magnitude and compute the portfolio returns of a strategy that longs "underpriced" stocks and shorts "overpriced" stocks considering different holding periods around the film releases. If our conjecture is supported, we should obtain significant abnormal returns for longing the highest "underpriced" beta portfolio and shorting the highest "overpriced" beta portfolio. We find that that this long-short strategy can yield an annualized abnormal risk-adjusted return up to 13.5% per year within five days around the Hollywood film release event.

The remainder of the paper is structured as follows. Section 2 describes data selection and descriptive statistics. Section 3 validates Hollywood release events as exogenous shocks to investor attention and provides empirical results on return comovement. Section 4 presents seasonality adjustments and weekend effects. Section 5 provides the results of further analyses. Section 6 presents the trading strategy profitability based on investor inattention surrounding Hollywood film releases. Section 7 concludes the paper.

2. Data selection and descriptive statistics

In this study, we consider films released by Hollywood's big five studios: Universal, Paramount Pictures, Warner Bros., Walt Disney and Sony Pictures, over the period 1980–2019 and identify trading days on which films are released. We then employ film days as exogenous shocks to investor attention. We source data on films from The Numbers, a database of film releases and film performance statistics. The Numbers provides data on film name, film production studio, release date, film genre, and revenue and ticket-related information.[8] We exclude films with box office revenue lower than $10 million as these films are of small scale and intuitively less attention-grabbing.

We provide detailed data of these Hollywood film releases in

[8] Find more information at: https://www.the-numbers.com/. We thank Bruce Nash and Olivia Dadgari for supporting us in data provision.

Table 1
Hollywood film release data.

Panel A: Full sample

Period	Total Films	Total Film Days	Single Film Days	Multiple Film Days
1980s	47	45	43	2
1990s	216	176	139	37
2000s	668	456	282	174
2010s	681	476	307	169
Total	1612	1153	771	382

Panel B: Distribution of Films Made by 5 Major Hollywood Studios

	Universal	Paramount Pictures	Warner Bros.	Walt Disney	Sony Pictures
1980s	8	13	14	3	9
1990s	37	37	45	50	47
2000s	124	114	152	123	155
2010s	148	100	177	100	156
Total	317	264	388	276	367

The table presents the data on films released by five major Hollywood studios from 1980 to 2019. Panel A presents the distribution of Hollywood films and film days by decades. Film days are divided into single and multiple film days. We define single (multiple) film days as days with only (more than) one film released. Panel B presents the distribution of films released by five major Hollywood studios: Universal, Paramount Pictures, Warner Bros., Walt Disney, and Sony Pictures. In our study, we exclude films with revenue of less than $10 million.

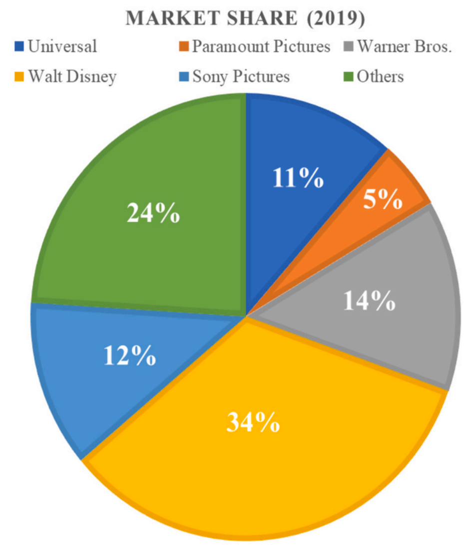

Fig. 1. Market shares of the big five Hollywood studios in 2019 (Source: Statista).

Table 1.[9] Panel A shows that there are 1612 Hollywood films in this sample period, and these films were released on 1153 days (i.e., the day with at least one film released). We also split our film days into 771 single and 382 multiple film days. We define single film days as days with only one film released and multiple film days with more than one film released. In general, the number of films and film days increases over time. This trend is consistent with the rapid development of the entertainment industry. In Panel B, we present the distribution of films released by Hollywood studios. Warner Bros. ranks 1st with 388 films. Sony Pictures, Universal, Walt Disney and Paramount Pictures come with 367, 317, 276 and 264 films.

We retrieve stock return, trading volume and share outstanding from the Centre for Research in Security Prices (CRSP). Our sample includes common stocks with share codes 10 and 11 traded on NYSE/Amex and Nasdaq. Since film releases could affect the fundamentals of firms in the motion picture industry other than their investors' inattention, we exclude these firms from our sample.[10] Our final sample includes 3885 unique firms over the 1980–2019 period. We obtain daily and weekly Google Search Volume Index (SVI) for the keyword 'Hollywood' terms and S&P 500 firm names from Google Trends to measure investor attention. We select the search region as the U.S. The data of Google Search are available from January 4, 2004 to December 31, 2019.[11]

3. Hollywood film release events as exogenous shocks to investor attention

3.1. The validation of Hollywood film release events as exogenous shocks

The main argument in our study is that Hollywood film release events plausibly attract investor attention away from the financial markets, leading to higher stock return comovement with the market. This is because investors tend to pay more attention to market shocks than firm-specific information when the overall attention is low. In this section, we introduce several tests to validate Hollywood film release events as exogenous shocks to investors' attention. First, we examine share turnover and abnormal SVI for S&P 500 firm names as proxies for trading activities and investor attention around the events. Second, we examine abnormal SVI for the keyword 'Hollywood' term around Hollywood film release events to verify whether the events are attractive to the U.S. public.

Following Gervais, Kaniel, and Mingelgrin (2001), we first capture investors' attention to the financial markets by share turnover, which is a primary proxy for trading activities. We construct daily share turnover as daily trading volume divided by the total share outstanding. We argue that if Hollywood film release events attract investors away from the financial markets, share turnover should be lower on film days than on non-film days. Our second proxy is based on abnormal SVI. Da, Engelberg, and Gao (2011) argue that if someone searches for a stock on Google, this undoubtedly reveals that person's attention to the stock. Hence, aggregating Google search for a stock is an unambiguous proxy for investor attention to the stock. We follow Huang et al. (2019) and use abbreviated company names in the Google search engine. We exclude name abbreviations with generic meanings that result in noisy SVI. Out of the S&P 500 firms, we can extract daily and weekly SVIs for 456 stocks from January 2004 to December 2019. Following Huang et al. (2019), we adjust the daily SVIs for each stock to make them more

[9] As a robustness check, we perform the subsample analysis which considers 10-year intervals within the sample period from 1980 to 2019. Besides, as observed, the film days in the 2000s and 2010s constitute >80% of the total film days in the sample while these periods coincide with several significant events, including Dot-com bubble and burst (1995–2002), the Global Financial Crisis (2007–2009), the European Debt Crisis (2010−2012), and the Chinese stock market crash (2015–2016). We perform an additional robustness test that excludes the periods of these significant events to address a potential concern that these extreme periods may have contributed to strengthen the stock return comovement. Both robustness tests confirm the consistency of our findings. We do not include these analyses to conserve space. However, results are available upon request.

[10] There are only 42 firms in the motion picture industry (2-digit SIC = 78).

[11] The earliest available data for SVI are from January 4, 2004. Find more information at https://trends.google.com/trends/explore?q=Hollywood&geo=US

comparable across time before calculating abnormal daily SVIs. The calculation of adjusted and abnormal SVIs is shown below:

$$\mathrm{SVI_{AD,d}} = \mathrm{SVI_w}^{*}\left(\mathrm{SVI_{UN,d}}/\mathrm{MESVI_w}\right) \tag{1}$$

$$\mathrm{ASVI_d} = \left(\mathrm{SVI_{AD,d}}–\mathrm{MDSVI_{AD}}\right)/\mathrm{MDSVI_{AD}} \tag{2}$$

where $SVI_{AD,d}$ ($SVI_{UN,d}$) is an adjusted (raw) SVI on day d; SVI_w is the weekly SVI to which a raw daily SVI, $SVI_{UN,d}$, belongs; and $MESVI_w$ is the weekly average of raw daily SVIs. $ASVI_d$ is an abnormal SVI on day d, and $MDSVI_{AD}$ is the median of adjusted daily SVIs between weeks $w-25$ and $w-5$. Like share turnover, we also expect that abnormal SVI for S&P 500 firm names should be lower on film days than on non-film days.

Table 2 reports these results. Consistent with our expectation, Panel A shows that share turnover and abnormal SVI for S&P 500 firm names are significantly lower on film days than on non-film days. Specifically, the differences in mean and median values of share turnover between film days and non-film days are −0.087 and − 0.064, respectively. In a multivariate regression where we regress daily share turnover on a dummy variable for firm days (i.e., the dummy variable taking a value of one if the day is a film day, and zero otherwise), the results are robust after controlling for firm, year, month, and day of week fixed effects. Panel B shows that share turnover decreases by 0.048 on film days relative to non-film days. Differences from all tests are statistically significant at the 1% level. We also find the same results for abnormal SVI for S&P 500 firm names as the differences in mean and median values of S&P 500 firm names between film days and non-film days are −0.058 and − 0.034, respectively. The results support our argument that investors are attracted away from the financial markets during film release events, as evidenced by a lower level of trading activities and a higher level of searching for firm names.

We also use abnormal SVI for the keyword ‘Hollywood’ to capture the public attention to Hollywood film release events. We argue that if the public are interested in Hollywood film release events, Google SVI for the search term ‘Hollywood’ should be higher on film days than on non-film days. The results are also reported in Table 2. As expected, abnormal SVI for ‘Hollywood’ is significantly higher on film days than on non-film days. Specifically, the differences of the mean and median values in abnormal SVI between film days and non-film days are 1.141 and 0.891, respectively. In a multivariate regression in Panel B, we also document higher search activities after controlling for year, month, and day of week fixed effects. The differences from all tests are statistically significant at 1% level.

Overall, the findings for reduced share turnover and abnormal SVI for firm names and increased abnormal SVI for ‘Hollywood’ provide supportive evidence that the U.S. public pay attention to Hollywood film release events, and trading activities on the financial markets are negatively affected.

3.2. Stock return comovement with the market

In this study, we hypothesize that when film release events distract investors from the financial markets, individual stock returns comove more with the market because investors, with a lower level of general attention, place more weight on market-wide information than firm-specific information. We follow the literature to construct two proxies for the stock return comovement with the market. The first proxy is the time series Pearson correlation coefficient between the excess stock return and the market excess return (e.g., Anton & Polk, 2014; Huang et al., 2019). For each firm, we calculate the Pearson correlation coefficient between the excess stock return and the market excess return on film and non-film days separately, denoted as $\mathrm{CORR}_{F,i}$ and $\mathrm{CORR}_{NF,i}$, respectively. We then calculate the mean and median differences in the Pearson correlation coefficient between film and non-film days across all n firms in our sample (i.e., 3885 firms), denoted as MECORR_{FNF} and MDCORR_{FNF}, respectively. We then test if MECORR_{FNF} and MDCORR_{FNF} are greater than zero. We argue that if investors' attention to the financial markets is lower on film days, investors would disproportionally pay more attention to learning about market-wide information than firm-specific information, resulting in an increase in individual stock return comovement with the market.

The second proxy for stock return comovement with the market is the adjusted R-squared from the market model regression. We follow the literature (e.g., Barberis et al., 2005) and perform the market model for each individual firm as follows:

$$\mathrm{Return}_{i,t} = \alpha_i + \gamma_i \mathrm{Market}_t + \varepsilon_{i,t} \tag{3}$$

$\mathrm{Return}_{i,t}$ and Market_t denote the excess returns of stock i and the market on day t, respectively. For each firm i, we regress Eq. (3) for film and non-film days separately and obtain two values of adjusted R-squared, $\mathrm{R}^2_{F,i}$ and $\mathrm{R}^2_{NF,i}$, respectively. We then calculate the mean and median differences in adjusted R-squared between film and non-film days across all n firms in our sample, denoted as MER^2_{FNF} and MDR^2_{FNF}, respectively.

The literature (e.g., Durnev et al., 2004; Morck et al., 2000) suggests that the adjusted R-squared from the market model reflects the extent to which firm-specific information is incorporated in stock returns. Higher R-squared indicates more (less) market (firm-specific) shock in stock returns. Because we expect that investors pay more attention to learning about market-wide information than firm-specific information on film days, we test if MER^2_{FNF} and MDR^2_{FNF} are greater than zero.

We report the results in Panel A of Table 3. Consistent with our expectation, we find that individual stocks exhibit a sharp increase in return comovement with the market on film days. Specifically, the return correlation coefficients on film days are higher than those on non-film days, $\mathrm{MECORR}_{FNF} = 0.008$ and $\mathrm{MDCORR}_{FNF} = 0.032$. We also find similar results when we examine the values of adjusted R-squared. The differences in the mean and median values of adjusted R-squared between film and non-film days are statistically significant. Specifically, $\mathrm{MER}^2_{FNF} = 0.035$ and $\mathrm{MDR}^2_{FNF} = 0.018$, respectively. The differences from these tests are statistically significant at the 1% level. The results provide strong evidence that during film release events, investors pay more attention to market-wide information than to firm-specific information, resulting in a greater comovement between stock returns and the market. We also perform additional analysis to examine stock return comovement with the industry increases around film days and report them in Appendix A1.[12] Interestingly, we document the same pattern with the main findings as stock returns comove more with the industry on film days than on non-film days.

We next question which main factor drives the changes in the stock return comovement with the financial markets on the film release days. We follow Huang et al. (2019) to decompose the difference in logged correlation coefficient between film release and non-film release days into three pieces as follows:

$$log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}} = log\frac{\sigma^{FD}_{i,Mar}}{\sigma^{NFD}_{i,Mar}} - log\frac{\sigma^{FD}_{i}}{\sigma^{NFD}_{i}} - log\frac{\sigma^{FD}_{Mar}}{\sigma^{NFD}_{Mar}} \tag{4}$$

where $\rho^{FD}_{i,Mar}(\sigma^{FD}_{i,Mar})$ and $\rho^{NFD}_{i,Mar}(\sigma^{NFD}_{i,Mar})$ denote the correlation coefficient (covariance) between firm i's excess returns and market excess returns on film and non-launch days, respectively. σ^{FD}_i (σ^{FD}_{Mar}) and σ^{NFD}_i (σ^{NFD}_{Mar}) are the standard deviation of firm i's excess returns (market excess returns) on film release and non-release days, respectively.

To investigate how much (in %) these pieces contribute to the change in the correlation coefficient, we divided them by the change in corre-

[12] We also account for the possibility that films can be release in the evening of the event day, we re-estimate our baseline results by shifting all event days t to $t+1$ trading day. The results are similar and reported in Table A2 in the Appendix.

Table 2
Share turnover & google search volume index.

Panel A: Difference Tests

	Share Turnover			Google Search Volume Index (SVI)					
				Abnormal SVI for S&P 500 Firms			Abnormal SVI for 'Hollywood'		
	Film Days (1)	Non-Film Days (2)	(1)–(2)	Film Days (3)	Non-Film Days (4)	(3)–(4)	Film Days (5)	Non-Film Days (6)	(5)–(6)
Mean	0.401	0.488	−0.087***	0.248	0.306	−0.058***	1.165	0.023	1.141***
			(0.000)			(0.000)			(0.000)
Median	0.287	0.351	−0.064***	−0.004	0.030	−0.034***	0.881	−0.009	0.891***
			(0.000)			(0.000)			(0.000)

Panel B: Regression

	Share Turnover	Abnormal SVI for S&P 500 Firms	Abnormal SVI for 'Hollywood'
Film Day	−0.048***	−0.052***	1.150***
	(0.000)	(0.000)	(0.000)
Fixed Effects	Yes	Yes	Yes
Adj. R-squared	0.112	0.043	0.420
Observations	46,715,643	2,346,558	5848

The table compares investors' trading activity and Google Search Volume Index (SVI) between film non-film release days. We measure the share turnover as the daily trading volume divided by the shares outstanding (unit:%). We obtain SVI for the S&P 500 firm names and "Hollywood" term from Google Trends, and we choose the region of the U.S. since we focus on U.S. investors' attention. Our sample includes 3885 firms. The sample period for SVI is from January 4, 2004, to December 31, 2019. We collect weekly SVIs over the sample period and unadjusted daily SVI over each quarter. For each S&P 500 firm name or "Hollywood", we measure normal and abnormal SVI as follows:
$SVI_{AD,d} = SVI_w * (SVI_{UN,d} / MESVI_w)$ (1), $ASVI_d = (SVI_{AD,d} - MDSVI_{AD}) / MDSVI_{AD}$ (2)
where $SVI_{AD,d}$ ($SVI_{UN,d}$) is an adjusted (raw) SVI on day *d*; SVI_w is the weekly SVI to which a raw daily SVI, $SVI_{UN,d}$, belongs; and $MESVI_w$ is the weekly average of raw daily SVIs. $ASVI_d$ is an abnormal SVI on day *d*, and $MDSVI_{AD}$ is the median of adjusted daily SVIs between weeks $w - 25$ and $w - 5$. In Panel A, we perform the paired *t*-test to test the mean difference and Wilcoxon signed-rank to test the median difference. In Panel B, we run panel regressions of share turnover, abnormal SVI for S&P 500 firm names, and "Hollywood" on a dummy variable, *Film Day*, taking the value of one if the day is a film day and zero otherwise. We include firm, year, month, and day of the week fixed effects in our regressions. Standard errors are clustered at the firm level and are adjusted for heteroskedasticity. We report the *p*-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

lation coefficient, $log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}}$, and express them as A1, A2, and A3, respectively.

$$1 = \underbrace{\frac{log\frac{\sigma^{FD}_{i,Mar}}{\sigma^{NFD}_{i,Mar}}}{log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}}}}_{A1} + \left[\underbrace{-\frac{log\frac{\sigma^{FD}_{i}}{\sigma^{NFD}_{i}}}{log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}}}}_{A2}\right] + \left[\underbrace{-\frac{log\frac{\sigma^{FD}_{Mar}}{\sigma^{NFD}_{Mar}}}{log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}}}}_{A3}\right] \quad (5)$$

A1 represents the percentage contribution of the change in covariance between stock excess return and market excess return to the change in the correlation coefficient. A2(3) represents the percentage contribution of the change in stock (market) volatility.

We report the results in Panel B of Table 3. The first three columns of Panel B present that the change in covariance is the main driver of the change in correlation coefficient with its mean and median percentage contributions of around 126%. In addition, the last column also confirms that the covariance between stock excess return and market excess return increases considerably on firm release days. The results once again support our baseline results.

3.3. Spillover effects of Hollywood film release events

In this section, we test for the possible spillover effects of Hollywood film release events by investigating stock return comovement with the market on non-film days immediately before and after each film release event. We classify non-film days into preceding trading days, following trading days, and other non-film days. We define preceding and following trading days as two (or four) days before and after the film days, respectively, and other non-film days are the remaining days.

We report the results for two (four) preceding and following days in Panel A (B) of Table 4. In general, we find that stock return comovement with the market is lower on preceding and following days than on film days, but higher than that on non-films days. Panel A shows that the differences in the mean and median values of return correlation with the market between film days and two preceding (following) trading days are 0.006 (0.006) and 0.015 (0.020), while the difference between two preceding (following) days and non-film days are 0.006 (0.005) and 0.015 (0.010). All difference tests are statistically significant at the conventional levels. In addition, we find no significant difference in return correlation with the market between two days preceding and two days following the film day.

We document similar findings when we use adjusted R-squared as the proxy for comovement. The results remain consistent for the tests on four preceding and following trading days reported in Panel B. We also plot the stock return comovements, proxied by return correlation and adjusted R-squared, in time window [−4, 4] around film days in Fig. 2 and Fig. 3, respectively. The figures show that Hollywood film release events result in a gradual increase in return comovement with the market on pre-event days, which then peaks on official film days before decreasing gradually on post-event days.

4. Seasonality adjustments and weekend effects

Since many movies tend to be released during major holidays (e.g., Thanksgiving, Christmas and New Year) and on weekend days (e.g., Friday, Saturday and Sunday), investors are potentially distracted from the financial markets on these days, leading to higher return correlations with the markets, irrespective of their attention to Hollywood films. To address the possibility that our results are driven by seasonality elements and weekend time, we introduce a set of tests to isolate seasonality and weekend effects.[13]

We introduce two tests to control for seasonality effects. We first introduce month dummies into the market model regression (i.e., Eq. (3)) to estimate adjusted R-squared. For each firm, we run the following market model to obtain adjusted R-squareds on film and non-film days separately:

$$\text{Return}_{i,t} = \alpha_i + \gamma_i \text{Market}_{i,t} + \vartheta_i \text{Month}_t + \varepsilon_{i,t} \quad (6)$$

We then apply the paired *t*-test to the mean difference and Wilcoxon signed-rank test to the median difference in adjusted R-squared between film and non-film days across the sample firms.

Second, for each firm, we first run the market model Eq. (3) within each month and obtain a series of monthly adjusted R-squared. We next run the OLS regression as follows:

$$\text{R}-\text{squared}_{i,m} = \alpha + \gamma \text{Hollywood\_Film}_{i,m} + \vartheta \text{Month}_m + \varepsilon_{i,m} \quad (7)$$

where R-squared$_{i,m}$ is the monthly adjusted R-squared of firm *i* in month *m*. Hollywood_Film$_{i,m}$ is a dummy variable that takes the value of one if at least one Hollywood film is released in month *m* and zero otherwise. Month$_m$ is a series of month dummies to control for seasonality effects.

Panels A and B of Table 5 present the results for the first and second solutions, respectively. Panel A shows that the mean and median difference in adjusted R-squared between film and non-film days is 0.199 and 0.135, respectively. Both difference tests are statistically significant at the 1% level. Panel B shows that the coefficient of the dummy variable, Hollywood_Film, is 0.034 (column 2, after controlling for month fixed effects) and statistically significant, indicating that the adjusted R-squared is higher on Hollywood film months than on non-Hollywood film months. These results confirm that our findings are not driven by seasonality effects. In other words, irrespective of the major holidays, investors are distracted by Hollywood film release events from the financial markets, leading to higher correlations between stock and market returns on event days.

We next introduce an additional analysis to test whether our results are independent of weekend effects. We divide Hollywood film days into weekend film days and non-weekend film days. In our main analysis, we define a Hollywood film day as a weekend film day if the day is either Friday, Saturday or Sunday.[14] We then replicate the main analysis and compare stock return comovement with the market between weekend film days, non-weekend film days, and non-film days.

The results are reported in Table 6. Although we find that the correlation coefficients are relatively larger for film releases during the weekend than during weekdays, they are both statistically significantly higher than those of non-film days. The differences are economically larger in magnitude for adjusted R-squared. Overall, the findings in

Table 3
Stock return comovement with the market.

Panel A: Stock Return Comovement

		Film Days (1)	Non-Film Days (2)	(1)–(2)
Correlation Coefficient	Mean	0.183	0.175	0.008*** (0.000)
	Median	0.171	0.140	0.032*** (0.000)
Adj. R-squared	Mean	0.088	0.052	0.035*** (0.000)
	Median	0.038	0.020	0.018*** (0.000)

Panel B: Decomposition of the Changes in Correlation Coefficient

	Percentage Contribution			%D in Covariance
	A1	A2	A3	
Mean	126%*** (0.000)	−0.2% (0.985)	−28%*** (0.000)	0.129*** (0.000)
Median	126%** (0.000)	−0.3% (0.975)	−22%*** (0.000)	0.095** (0.032)

Panel A presents the Pearson correlation coefficients of stock excess returns and market excess returns for film and non-film days separately. The CAPM model's adjusted R-squareds are also obtained for the respective two groups. In Panel B, we follow Huang et al. (2019) and decompose the change in logged correlation coefficient as below:

$$log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}} = log\frac{\sigma^{FD}_{i,Mar}}{\sigma^{NFD}_{i,Mar}} - log\frac{\sigma^{FD}_{i}}{\sigma^{NFD}_{i}} - log\frac{\sigma^{FD}_{Mar}}{\sigma^{NFD}_{Mar}} \quad (4)$$

where $\rho^{FD}_{i,Mar}(\sigma^{FD}_{i,Mar})$ and $\rho^{NFD}_{i,Mar}(\sigma^{NFD}_{i,Mar})$ denote the correlation coefficient (covariance) between firm *i*'s excess returns and market excess returns on film and non-film days, respectively. σ^{FD}_{i} (σ^{FD}_{Mar}) and σ^{NFD}_{i} (σ^{NFD}_{Mar}) are the standard deviation of firm *i*'s excess returns (market excess returns) on film release and non-film days, respectively. The first three column shows how much (in %) these three components contribute to the change in the correlation coefficient, where A1, A2, and A3 are defined as follows.

$$1 = \underbrace{\frac{log\frac{\sigma^{FD}_{i,Mar}}{\sigma^{NFD}_{i,Mar}}}{log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}}}}_{A1} + \underbrace{\left[-\frac{log\frac{\sigma^{FD}_{i}}{\sigma^{NFD}_{i}}}{log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}}}\right]}_{A2} + \underbrace{\left[-\frac{log\frac{\sigma^{FD}_{Mar}}{\sigma^{NFD}_{Mar}}}{log\frac{\rho^{FD}_{i,Mar}}{\rho^{NFD}_{i,Mar}}}\right]}_{A3} \quad (5)$$

The last column shows the percentage difference in the covariances for firm *i*'s excess return and market excess return between film and non-film days (i.e., $\frac{\sigma^{FD}_{i,Mar} - \sigma^{NFD}_{i,Mar}}{\sigma^{NLD}_{i,Mar}}$). We perform the paired *t*-test to test the mean difference and Wilcoxon signed-rank to test the median difference. We report the *p*-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Tables 5 and 6 confirm the effect of Hollywood film release events on the change in stock return comovement even after controlling for seasonality and weekend effects.[15]

[13] In a similar vein, one may concern that the findings can be driven by the vacation months when the movie releases are concentrated. To address this valid concern, we conduct an additional robustness test by replicating the main analysis on the stock return comovement with the markets for vacation months (i.e., June/July/August/September and December) and non-vacation months (i. e., January, February, March, April, May, October, and November). In line with the main analysis, we use two proxies for stock return comovement with the markets, including (1) Pearson correlation coefficient between stock excess return and market excess return, and (2) adjusted R2 by regressing the market model. We find that stock returns comove more with the markets on film days than non-film days for both vacation months and non-vacation months. In addition, we find that there is no difference in stock return comovement with the markets on film days (non-film days) between vacation months and non-vacation months. The results suggest that our findings are not affected by a "vacation distraction" effect. We report these results in Table A3 in the Appendix and thank an anonymous referee for suggesting this test.

[14] 955 (81%) of our sample film days fall on Friday with only 7 film days are on Saturday and Sunday.

[15] There might be a concern that a time-varying variable such as overall market sentiment can affect the return comovement. We address this concern by also controlling for the Baker and Wurgler (2006)'s sentiment index following similar analyses we performed to control the seasonality and weekend effects. Our findings remain highly consistent. We further employ the Oster's, (2009) test for coefficient stability under the effect of unobserved factors. We find that the effect of unobserved factors needs to be around two times larger than that of the included explanatory variables to invalidate our findings. This implies that our findings are not materially subject to bias due to omitted variables. Results are available upon request.

Table 4
Spillover effects of stock return comovement with the market.

	Panel A: k = 2				*Panel B: k = 4*			
	Correlation Coefficient		Adjusted R-squared		Correlation Coefficient		Adjusted R-squared	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
(1) Film Day *t*	0.183	0.171	0.088	0.038	0.183	0.171	0.088	0.038
(2) Pre-Release Days (*t* - *k*)	0.177	0.156	0.078	0.031	0.171	0.163	0.068	0.028
(3) Post-Release Days (*t* + *k*)	0.176	0.152	0.079	0.031	0.171	0.160	0.065	0.027
(4) Non-Film Days	0.171	0.141	0.051	0.020	0.168	0.136	0.049	0.019
(1)–(2)	0.006**	0.015***	0.010***	0.007***	0.012***	0.009***	0.019***	0.010***
	(0.016)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
(1)–(3)	0.006***	0.020***	0.008***	0.007***	0.012***	0.011***	0.022***	0.011***
	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(1)–(4)	0.012***	0.030***	0.037***	0.018***	0.015***	0.036***	0.038***	0.019***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(2)–(3)	0.001	0.005*	−0.001	0.000	0.000	0.002	0.003***	0.001
	(0.677)	(0.482)	(0.208)	(0.002)	(0.962)	−0.36	(0.001)	(0.363)
(2)–(4)	0.006***	0.015***	0.027***	0.011***	0.003	0.027***	0.019***	0.009***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.126)	(0.000)	(0.000)	(0.000)
(3)–(4)	0.005***	0.010***	0.029***	0.010***	0.003*	0.025***	0.016***	0.008***
	(0.003)	(0.000)	(0.000)	(0.000)	(0.084)	(0.000)	(0.000)	(0.000)

The table presents the stock return comovement with the market on film days, pre-film days, post-film days and non-film days. We define pre-film days and post-film days as spillover days. We capture the stock return comovement with the market by (1) the time series Pearson correlation of stock excess returns and market excess returns and (2) the adjusted R-squared obtained by regressing the CAPM model. These are calculated separately on film days, pre-film days, post-film days and non-film days. We perform the paired *t*-test to test the mean difference and Wilcoxon signed-rank to test the median difference. We report the *p*-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

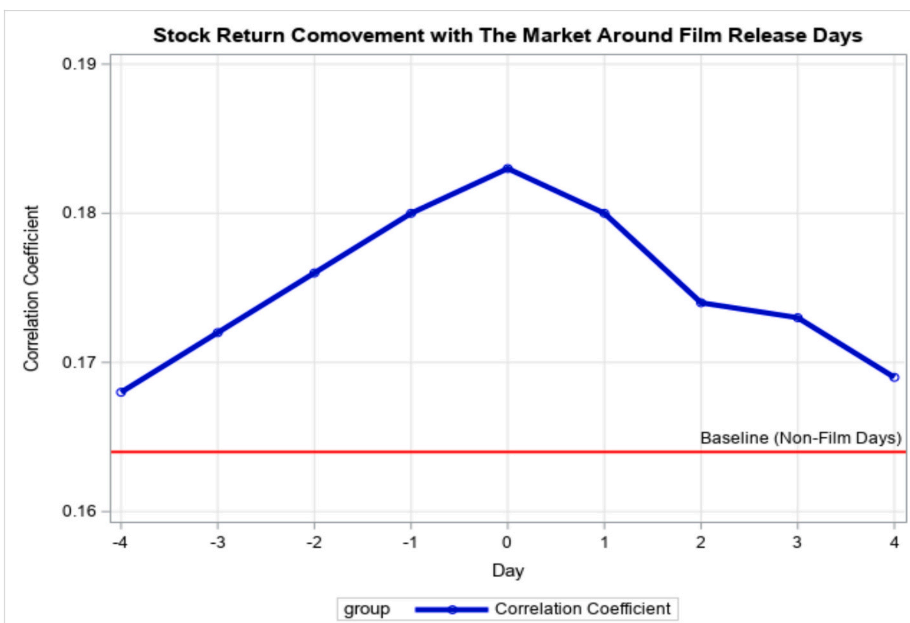

Fig. 2. Stock return comovement with the market around film release days (proxied by Pearson correlations between stock excess return and the market excess return).

5. Further analysis

5.1. Multiple vs single film days

In this section, we conjecture that big events with more than one movie released attract more strongly investor attention away from the financial markets. We first define a multiple film day as a day with more than one film released, while a single film day with only one film released. The results are reported in Table 7. In general, we show that stock returns comove more with the market on multiple film days than on single film days, which is in line with our conjecture that investors are more distracted on big film days. We also show that stock return comovement with the market is higher on both single and multiple film days than on non-film days although the increase is significantly larger for days with multiple film releases. Specifically, Table 7 shows that the mean and median difference in Pearson correlation coefficient between multiple and single film days are 0.022 and 0.069, respectively. The figures between multiple (single) and non-film days are 0.026 (0.005) and 0.092 (0.023), respectively. All difference tests are statistically significant at the conventional levels.

5.2. Movies with A-list star actors

The effect of movies on investor attention may well be different

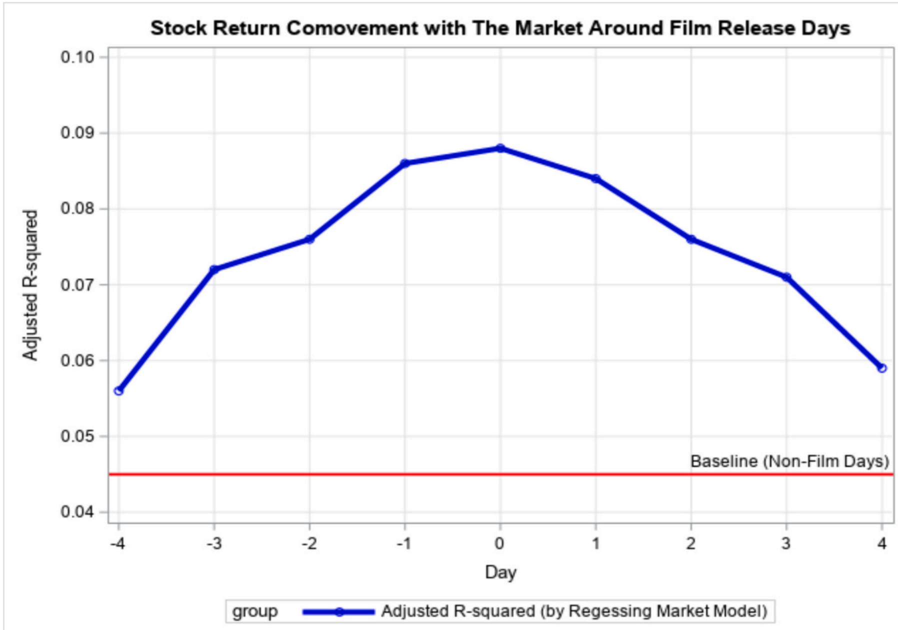

Fig. 3. Stock return comovement with the market around film release days (proxied by adjusted R-squared from the market model regressions).

Table 5
Seasonality adjusted return comovement.

Panel A: Difference Tests for Seasonality-Controlled Adjusted R-squareds			
	Film Days (1)	Non-Film Days (2)	(1)–(2)
Mean	0.262	0.063	0.199***
			(0.000)
Median	0.168	0.033	0.135***
			(0.000)
Panel B: Regressions of Adjusted R-squareds on Film Day and Monthly Dummies			
Hollywood_Film	0.030***	0.034***	
	(0.000)	(0.000)	
Month Fixed Effects	No	Yes	
Adj. R-squared	0.004	0.006	
Observations	2,477,179	2,477,179	

The table presents the stock return comovement with the market with seasonality adjustments. In Panel A, we first capture the adjusted R-squared by regressing the CAPM model with a series of month dummies to control for seasonality effects. This is done for each firm on film and non-film days separately. Next, we report the mean, median, their differences, and perform the paired *t*-test to test the mean difference and Wilcoxon signed-rank to test the median difference. In Panel B, we first obtain each firm's monthly adjusted R-squared from the CAPM model. Second, we regress these on *Hollywood Film*, a dummy variable that takes the value of one if at least one Hollywood film is released in a month and zero otherwise. We include a series of month dummies in the second step to control for seasonality effects. We report the *p*-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

between those with A-list star casts and those without. The promotion of films often begins even before production, with the announcement of the A-list cast generating significant public interest and media coverage. For instance, the announcement of A-list stars joining Christopher Nolan's film "Oppenheimer" generated a trend on social media and extensive coverage, illustrating how actors are crucial in film publicity campaigns.[16] A recent survey conducted in 2023 by the National Research Group, a firm specializing in entertainment and technology, which asked respondents to "name up to five actors that would make them most interested in going to the movie theatre", highlighted the significant draw of A-list stars. This survey's result indicates the strong influence A-list actors have on audience decisions to watch movies in theatres.[17] According to Elberse (2007), which investigates the dynamics of star power in the film industry, the involvement of powerful actors and actresses contributes significantly to a film's success. This influence extends beyond just their acting skills, encompassing factors like a loyal fan base, a knack for choosing promising projects, and a strong box-office record.

Given the above arguments, we expect that film's actors attract investors differently and that films with A-list stars may impose a stronger

Table 6
Return comovement – weekend effects.

	Correlation Coefficient		Adjusted R-squared	
	Mean	Median	Mean	Median
(1) Weekend Film Days	0.186	0.188	0.098	0.045
(2) Non-Weekend Film Days	0.177	0.147	0.080	0.034
(3) Non-Film Days	0.174	0.140	0.052	0.020
(1)–(2)	0.009***	0.041***	0.018***	0.011***
	(0.000)	(0.000)	(0.000)	(0.000)
(1)–(3)	0.012***	0.048***	0.046***	0.026***
	(0.000)	(0.000)	(0.000)	(0.000)
(2)–(3)	0.003*	0.007***	0.028***	0.015***
	(0.056)	(0.000)	(0.000)	(0.000)

The table compares stock return comovement with the market on weekend film days, non-weekend film days, and non-film days. We define weekend film days as Friday, Saturday and Sunday film days, while non-weekend film days are others. We capture the stock return comovement with the market by (1) the time series Pearson correlation of stock excess returns and market excess returns and (2) the adjusted R-squared obtained by regressing the CAPM model. This is done for each firm and each group of (non-)film days separately. We perform the paired *t*-test to test the mean difference and Wilcoxon signed-rank to test the median difference. We report the *p*-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

[16] See, https://www.bu.edu/prlab/2022/04/19/how-does-public-relations-work-in-the-film-industry/

[17] See, https://thedirect.com/article/movie-stars-popular-2023-data

impact on investor attention compared to other films, and hence leading to higher stock return correlations with the market. To address this question, we categorize Hollywood movies featuring A-list star actors as those that include the participation of actors and actresses who have previously received major accolades such as Oscars, Golden Globes, or BAFTAs. We then replicate the main analysis to measure the stock return comovement with the market separately on the releasing days of films with A-list stars (called A-star film days), and films without the A-stars (called Non-A-star film days) and compare them with that on non-film days.

We report the results in Table 8. In general, we find that both types of film days exhibit a statistically and significantly higher stock return comovement with the market compared to non-film days, but a more noticeable surge is observed on A-star film days. In term of the correlation coefficient, we find that the stock return comovement with the market on A-star film days is 7.4 percentage points (mean) or 7.2 percentage points (median) higher than that on Non-A-star film days. We also observe the same patterns with adjusted R-squared. The findings lend support to the hypothesis that investors are more strongly distracted from the financial markets by movies having A-list star actors in their cast, resulting in higher stock return correlations with the market.

5.3. Blockbuster vs non-blockbuster film days

Blockbuster movies are more attractive to the media than non-blockbuster ones.[18] Hence, wider media coverage on blockbuster film days potentially attracts more investor attention away from the financial markets. Consistent with the literature (e.g., Veldkamp, 2006; Veldkamp & Wolfers, 2007), we argue that when investors are exogenously fascinated away from the financial markets on blockbuster film days, they pay more attention to the market shocks than to firm-specific information, leading to the higher correlation between stock returns with the market. Indeed, this is what we find.

We split our Hollywood film release days into blockbuster and non-blockbuster film days based on different criteria such as the total box office revenue, the initial revenue (i.e., on release date), the initial number of tickets sold (i.e., on release date) and the production budget. For each criterium, we classify films in to high and low groups based on the median value in a year. For example, films with the total revenue higher (lower) than the median total revenue across films in the same year are included in the high (low) total revenue group. Next, for each firm, we calculate the proxies for stock return comovement with the market on release days for these groups separately. As before, we use stock return comovements on non-film days as benchmarks.

We report the results for different criteria in Table 9. In general, we find that stock returns comove more with the market on blockbuster film days than non-blockbuster film days, supporting our arguments. We also show that stock return comovement with the market is higher on both blockbuster and non-blockbuster film days than on non-film days. Specifically, Panel A of Table 9 presents the results for the first definition of blockbuster and non-blockbuster film days based on total revenue. The mean and median of difference in stock correlation coefficient with the market (adjusted R-squared) between high and low revenue films are 0.015 (0.026) and 0.031 (0.006) on their release days, respectively.[19]

Table 7
Return comovement – multiple vs single film days.

	Correlation Coefficient		Adjusted R-squared	
	Mean	Median	Mean	Median
(1) Multiple Film Days	0.201	0.232	0.116	0.067
(2) Single Film Days	0.179	0.163	0.086	0.034
(3) Non-Film Days	0.174	0.140	0.052	0.02
(1)–(2)	0.022***	0.069***	0.030***	0.033***
	(0.000)	(0.000)	(0.000)	(0.000)
(1)–(3)	0.026***	0.092***	0.064***	0.048***
	(0.000)	(0.000)	(0.000)	(0.000)
(2)–(3)	0.005*	0.023***	0.034***	0.014***
	(0.089)	(0.000)	(0.000)	(0.000)

The table compares stock return comovement with the market on single film days, multiple film days, and non-film days. We define single film days as days with only one film released while multiple film days as days with more than one film released. We capture the stock return comovement with the market by (1) the time series Pearson correlation of stock excess returns and market excess returns and (2) the adjusted R-squared obtained by regressing the CAPM model. This is done for each firm and each group of (non-)film days separately. We perform the paired *t*-test to test the mean difference and Wilcoxon signed-rank to test the median difference. We report the *p*-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8
Return comovement – Hollywood A-list star actors.

	Correlation Coefficient		Adjusted R-squared	
	Mean	Median	Mean	Median
(1) A-star Film Days	0.255	0.222	0.116	0.058
(2) Non-A-star Film Days	0.181	0.150	0.074	0.031
(3) Non-Film Days	0.174	0.140	0.052	0.020
(1)–(2)	0.074***	0.072***	0.042***	0.027***
	(0.000)	(0.000)	(0.000)	(0.000)
(1)–(3)	0.081***	0.082***	0.064***	0.039***
	(0.000)	(0.000)	(0.000)	(0.000)
(2)–(3)	0.006***	0.01***	0.022***	0.012***
	(0.000)	(0.000)	(0.000)	(0.000)

The table presents the stock return comovement with the market for movies with A-list star actors (A-star film days), movies without A-list star actors (Non-A-star film days) and non-film days. We first capture the stock return comovement with the market by (1) the time series Pearson correlation of stock excess returns and market excess returns and (2) the adjusted R-squared obtained by regressing the CAPM model. This is done for each firm and each mentioned movie category across its release days. We also calculate correlation coefficient and adjusted R-squared for non-film days as a benchmark. We perform the paired t-test to test the mean difference and Wilcoxon signed-rank to test the median difference. We report the p-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

[18] Considering another interesting angle, we stratify our sample by genres of films. We find that stock return comovement with the market is higher on horror and fantasy film days and lower on action and comedy film days. We also find corroborating evidence: the abnormal Google SVI for 'Fantasy Film' and 'Horror Film' is significantly higher than that for 'Action Film' and 'Comedy Film' on film days when we split the searches by genres. These results are consistent with findings in the psychology literature such that movies that evoke fear, anxiety, horror, and disgust tend to draw a great deal of our attraction, thrill, and enjoyment because those dreadful factors stimulate the fear system that has evolved within us throughout the entire history of humankind (e.g., Clasen, 2012; Ohman & Mineka, 2001). When playing with fear or immersing ourselves in horror movies, we may learn important lessons regarding the dangers of the world and how to respond to them (e.g., Scrivner et al. (2024)). The psychological benefits of fear could explain why the horror entertainment is a strongly thriving industry and more than half of us enjoy horror movies (Clasen, Kjeldgaard-Christiansen, & Johnson, 2020). Fantasy films, another movie genre that is booming considerably over time, take viewers to a world of impossibilities with magical, extraordinary, and supernatural events. There are several reasons behind the attractiveness of fantasy films including the need of escaping from reality, fantasizing in dimensions of imagination, and portraying a world with different set of relationships, emotions, and events, and understanding our wishes, desires, motivation, and beliefs (Zipes, 2009). Results are available upon request.

[19] For brevity, we do not report stock return correlation coefficients and adjusted R-squareds on blockbuster, non-blockbuster film days and non-film days. The results are available upon request.

Table 9
Return comovement for blockbuster film days.

		Hi - Lo	Hi - Non-Film	Lo - Non-Film
Panel A: Total Box Office Revenue				
Correlation Coefficient	Mean	0.015***	0.019***	0.004*
		(0.000)	(0.000)	(0.097)
	Median	0.031***	0.078***	0.047***
		(0.000)	(0.000)	(0.000)
Adjusted R-squared	Mean	0.026***	0.056***	0.030***
		(0.000)	(0.000)	(0.000)
	Median	0.006***	0.024***	0.018***
		(0.000)	(0.000)	(0.000)
Panel B: Revenue on Release Date				
Correlation Coefficient	Mean	0.100***	0.105***	0.005*
		(0.000)	(0.000)	(0.088)
	Median	0.068***	0.101***	0.033***
		(0.000)	(0.000)	(0.016)
Adjusted R-squared	Mean	0.021***	0.055***	0.033***
		(0.000)	(0.000)	(0.000)
	Median	0.010***	0.030***	0.020***
		(0.000)	(0.000)	(0.000)
Panel C: Number of Ticket Sales on Release Date				
Correlation Coefficient	Mean	0.093***	0.099***	0.006*
		(0.000)	(0.000)	(0.061)
	Median	0.062***	0.095***	0.034***
		(0.000)	(0.000)	(0.001)
Adjusted R-squared	Mean	0.024***	0.056***	0.032***
		(0.000)	(0.000)	(0.000)
	Median	0.013***	0.031***	0.019***
		(0.000)	(0.000)	(0.000)
Panel D: Production Budget				
Correlation Coefficient	Mean	0.048***	0.052***	0.004*
		(0.000)	(0.000)	(0.096)
	Median	0.090***	0.133***	0.043***
		(0.000)	(0.000)	(0.000)
Adjusted R-squared	Mean	0.025***	0.056***	0.031***
		(0.000)	(0.000)	(0.000)
	Median	0.018***	0.031***	0.013***
		(0.000)	(0.000)	(0.000)

The table compares the stock return comovement with the market on blockbuster film days, non-blockbuster film days, and non-film days. Specifically, we split our Hollywood film release days into blockbuster and non-blockbuster film days based on different criteria such as the total box office revenue, the revenue on release date, the number of tickets sold on release date, and the production budget. For each criterium, we classify films in to high (Hi) and low (Lo) groups based on the median value in a year. For example, films with the total revenue higher (lower) than the median total revenue across films in the same year are included in the Hi (Lo) total revenue group. Next, for each firm, we calculate the proxies for stock return comovement with the market on release days for these groups separately. As before, we use stock return comovements on non-film days as benchmarks. We report the mean and median of the differences. We perform the paired *t*-test to test the mean difference and Wilcoxon signed-rank to test the median difference. We report the *p*-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

All difference tests are statistically significant. We also present paired difference tests between the high (low) revenue film days and non-film days in column 2 (3). The results are consistent with the main findings reported in Table 3 as stock return comoves more with the market on film days than on non-film days. Panels B—D document robust results in which we re-define blockbuster and non-blockbuster films. All robust results are statistically significant at the conventional lelvels.

6. Trading surrounding film release events

We next question whether investors could earn abnormal returns by following a hypothetical trading strategy that exploits the investors' distraction away from the financial markets on the Hollywood film release days. Our previous analysis supports that investors tend to focus on market-level information rather than firm-specific information when they are distracted away from the financial market due to limited human cognitive ability. This leads to a higher stock returns comovement with the market. In other words, the firm-specific information may not fully be incorporated in the stock prices on a short-term basis, and this can lead to short-term mispricing of stocks. This mispricing would be corrected when investor inattention dissipates, which may take a few days as suggested in our previous analysis. In this section, therefore, we aim to design a profitable trading strategy surrounding the Hollywood film release events to illustrate a financial implication of our main findings. Specifically, we hypothesize that if a stock has a large Hollywood beta, it is, on average, likely to be overpriced (underpriced) during market upwards (downwards). Our hypothesis is supported if one can earn abnormal returns by separating the overpriced and underpriced groups of stocks in each Holywood film release event and then performing a long-short strategy.

To identify the overpriced and underpriced groups of stocks corresponding to each Hollywood film release event t, we run an extended version of the Fama-French five factor model using one year data up to 10 days before the event as follows:

$$\begin{aligned}\left(Ret_{i,w}-Ret_{f,w}\right) =&\alpha_i+\beta_{i,o,t}\left(Ret_{m,w}-Ret_{f,w}\right)^{*}\mathrm{D}\left(Ret_{m,w}>0\right)^{*}Holywood_w \\ &+\beta_{i,u,t}\left(Ret_{m,w}-Ret_{f,w}\right)^{*}\mathrm{D}\left(Ret_{m,w}<0\right)^{*}Hollywood_w \\ &+\beta_1\left(Ret_{m,w}-Ret_{f,w}\right)+\beta_2 SMB_w+\beta_3 HML_w+\beta_4 RMW_w \\ &+\beta_5 CMA_w+e_{i,w}\end{aligned} \quad (8)$$

where $Ret_{i,w}$ is the return of firm i on day w; $Ret_{f,w}$ is the risk-free rate on day w. $Holywood_w$ is a dummy for Hollywood events, receiving a value of one on Hollywood film release days and zero on other days within the estimation window. D(.) is equal to one if the logical function is correct and zero otherwise. As per our conjecture discussed previously, $\beta_{i,o,t}$ in Eq. (8) captures the additional sensitivity of the likely overpriced stock's returns to market returns for each Hollywood film release event t. For brevity, we call $\beta_{i,o,t}$ as "overpriced" beta, and similarly, $\beta_{i,u,t}$ as "underpriced" beta. It is worth noting that the higher values of these betas indicate a higher chance of mispricing. We obtain the Fama–-French five common risk factors: the CRSP value-weighted market excess return, ($Ret_{m,w}$ – $Ret_{f,w}$), and the size (*SMB*), book-to-market (*HML*), operating profitability (*RMW*), and investment (*CMA*) factors from Kenneth French's website.[20]

After estimating the "overpriced" and "underpriced" betas for each stock in each Hollywood film release event, we sort stocks based on each type of betas into quintiles for each event to form five "overpriced" portfolios and five "underpriced" portfolios, respectively. After that, we apply the usual long-short strategy by longing (shorting) "underpriced" ("overpriced) beta portfolios at the beginning of a holding period and unwinding the positions at the end of the holding period. We consider a number of holding periods h, for a robustness check purpose, $h = [-2,0]$, $[-2,1]$, $[-2,2]$, $[-3,0]$, and $[-3,1]$. Finally, we evaluate the abnormal return of each long-short portfolio, α_p, using the Fama–French five factor model.

We report the α_p results based on value-weighted portfolio returns in Table 10 and leave the equally weighted results in Table A4 in the Appendix.[21] We find supporting results for our conjecture that portfolios being more sensitive to Hollywood film releases apparently earn larger abnormal returns and this is more so for shorter holding windows. The portfolios being the least sensitive to the event do not seem to generate abnormal returns. Interestingly, the long "underpriced" beta portfolios – short "overpriced" beta portfolios strategy, as shown in the last columns, generates larger abnormal returns when the position starts two days before the Hollywood film release events, 11.9%, 13.2%, and 13.5%, over the [−2, 0], [−2, 1], and [−2, 2] holding horizons.[22] These results are highly consistent with Figs. 2 and 3, in which we observe that the highest rate of an increase in the stock return comovement with the market starts from two days prior to the event.

7. Conclusion

Existing theoretical research predicts that when investors are exogenously attracted away from the financial markets, investors pay

Table 10
Trading strategy – value-weighted portfolio returns.

Holding Periods	"Underpriced" Betas					"Overpriced" Betas					Long Underpriced - Short Overpriced Strategy				
	1 (Lowest)	2	3	4	5 (Highest)	1 (Lowest)	2	3	4	5 (Highest)	1 (Lowest)	2	3	4	5 (Highest)
[−2, 0]	−0.011	0.012	0.035***	0.037***	0.047***	0.019	0.037***	0.053***	0.051***	0.072***	0.008	0.048*	0.088***	0.088***	0.119***
	(0.018)	(0.015)	(0.013)	(0.013)	(0.016)	(0.017)	(0.014)	(0.012)	(0.013)	(0.015)	(0.034)	(0.028)	(0.025)	(0.026)	(0.031)
[−2, 1]	−0.006	0.013	0.035***	0.042***	0.057***	0.024	0.036***	0.055***	0.052***	0.075***	0.018	0.049*	0.090***	0.094***	0.132***
	(0.018)	(0.015)	(0.013)	(0.013)	(0.015)	(0.016)	(0.014)	(0.012)	(0.013)	(0.015)	(0.034)	(0.028)	(0.025)	(0.026)	(0.030)
[−2, 2]	−0.001	0.015	0.036***	0.042***	0.058***	0.028	0.037***	0.054***	0.052***	0.077***	0.026	0.051*	0.09***	0.094***	0.135***
	(0.017)	(0.014)	(0.013)	(0.013)	(0.015)	(0.026)	(0.014)	(0.012)	(0.013)	(0.015)	(0.033)	(0.028)	(0.025)	(0.026)	(0.03)
[−3, 0]	−0.016	0.014	0.033***	0.036***	0.03**	0.008	0.028**	0.046***	0.046***	0.047***	−0.008	0.042	0.078***	0.082***	0.077***
	(0.017)	(0.014)	(0.012)	(0.013)	(0.015)	(0.016)	(0.013)	(0.012)	(0.012)	(0.014)	(0.032)	(0.027)	(0.024)	(0.025)	(0.029)
[−3, 1]	−0.014	0.014	0.034***	0.037***	0.031**	0.010	0.029**	0.047***	0.047***	0.048***	−0.004	0.043*	0.080***	0.084***	0.079***
	(0.016)	(0.014)	(0.012)	(0.013)	(0.015)	(0.016)	(0.013)	(0.012)	(0.012)	(0.014)	(0.032)	(0.027)	(0.024)	(0.025)	(0.029)

This table presents the value weighted abnormal returns of each portfolio, α_p, by regressing its excess returns on the Fama–French five factors using different holding periods. For the "underpriced" ("overpriced") beta portfolios, we long (short) them at the beginning of a holding period and short (long) at the end of the holding period. The last five columns represent the abnormal returns of the long "underpriced" beta portfolio and short "overpriced" beta portfolio in the corresponding quintile. The portfolios are formed corresponding to quintiles of the "underpriced" betas ($\beta_{i,u,t}$), and "overpriced" betas ($\beta_{i,o,t}$), which are estimated by firm by satellite events as follows. For each satellite event on date t, we employ one year data up to 10 days prior to the event (i.e., from $t-375$ to $t-10$) to run the following model:

$(Ret_{i,w} - Ret_{f,w}) = \alpha_i + \beta_{i,o,t}\,(Ret_{m,w} - Ret_{f,w})^{*}\mathrm{D}(Ret_{m,w} > 0)^{*}Hollywood_w + \beta_{i,u,t}\,(Ret_{m,w} - Ret_{f,w})^{*}\mathrm{D}(Ret_{m,w} < 0)^{*}Hollywood_w + \beta_1\,(Ret_{m,w} - Ret_{f,w}) + \beta_2 SMB_w + \beta_3 HML_w + \beta_4 RMW_w + \beta_5 CMA_w + e_{i,w}$ (8)

where $Ret_{i,w}$ is the return of firm i on day w ($w = t-375, \ldots, t-10$); $Ret_{f,w}$ is the risk-free rate on day w. $Hollywood_w$ is dummy Hollywood event, which receives a value of one on Hollywood film release days and zero on other days within the estimation window. D(.) receives value of one if the logical function is correct and zero otherwise. Controls are the Fama–French five common risk factors: the CRSP value-weighted market excess return, ($Ret_{m,w}$ - $Ret_{f,w}$), and the size (*SMB*), book-to-market (*HML*), operating profitability (*RMW*), and investment (*CMA*) factors. Robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

[20] https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[21] To address the potential concern about omitted variable bias in model (8), We conduct the Oster's (2009) test for coefficient stability under the effect of unobserved factors. We find that, on average, the effect of unobserved factors needs to be 2.5 times larger than that of the included explanatory variables to invalidate our findings. Therefore, our results are not subject to the problem of omitted variables. Results are available upon request.

[22] Based on Fong, Holden, and Trzcinka (2017), the average round-trip effective spread for U.S. listed stocks is approximately 2 basis points. Our strategy generates an average return between 7.7 and 13.5 basis points over a 3- or 5-day window surrounding the Hollywood film release date. This suggests that our trading strategy remains significantly profitable after adjusting for transaction costs.

disproportionally less attention to firm-specific information than market-wide information (Peng & Xiong, 2006; Veldkamp, 2006; Veldkamp & Wolfers, 2007). A lower level of investors' attention should result in higher stock return comovement with the market. We consider Hollywood film release events as exogenous shocks to U.S. investors' attention and examine individual stock return comovement with the market on such days.

We first validate Hollywood film release events as exogenous shocks to investors' attention by investigating changes in their trading activities and Google SVI for "Hollywood" around event days. We capture investors' trading activities by share turnover and find that they are lower on film days than on non-film days. In contrast, Google SVI for the keyword 'Hollywood' is higher on film days than on non-film days. These results confirm that Hollywood film release events distract investors from the financial markets.

We next show that stock returns comove more with the market on Hollywood film release days. Our results are not driven by seasonality or weekend effects. We also document spillover effects of Hollywood film events as stock return comovement with the market increases gradually on pre-event days and then peaks on official film days before decreasing on post-event days. We also show similar effects for stock return comovement with industry returns. These findings suggest that investors pay more attention not only to the market but also to industry information during Hollywood film release events, resulting in higher return comovement with both the market and industry returns. Considering the attractiveness of A-list star actors, we document that the effect on stock return comovement is stronger when for films with A-list star actors. Collectively, our results provide causal evidence for the effect of attention-grabbing film events on stock return comovements. We also find that investors can earn abnormal returns by following a trading strategy that employs Hollywood film-induced mispricing surrounding event days.

Our study offers two main contributions. First, we fill in the gap in empirical research that uses investor attention to explain phenomena in the financial markets following prior theoretical work (e.g., Veldkamp, 2006; Veldkamp & Wolfers, 2007). We next contribute the literature that explains return comovement in the financial markets (e.g., Barberis & Shleifer, 2003; Eun, Wang, & Xiao, 2015; Kumar, 2009; Roll, 1988). Our study offers new insights by linking investor attention to the stock return comovement. We show that when investors' attention is drawn towards non-financial exogenous events, they tend to pay less attention to learning about firm-specific information than market shocks, leading stock returns to comove more with market returns.

Data availability

No

Appendix

Table A1
Individual stock return comovement with industry.

	Film Days (1)	Non-Film Days (2)	(1)–(2)
Panel A: Correlation Coefficient			
Mean	0.178	0.169	0.009*** (0.000)
Median	0.163	0.129	0.033*** (0.000)
Panel B: Adjusted R-squared			
Mean	0.086	0.052	0.034*** (0.000)
Median	0.034	0.017	0.017*** (0.000)

The table presents the stock return comovement with the industry on film days and non-film days. We capture the stock return comovement with the industry by (1) the time series Pearson correlation of stock excess returns and industry excess returns and (2) the adjusted R-squared obtained by regressing the industry model. This is done for each firm on film and non-film days separately. We perform the paired *t*-test to test the mean difference and Wilcoxon signed-rank to test the median difference. We report the *p*-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A2
Stock return comovement with the market on day $t + 1$.

Panel A: Stock Return Comovement

		Film Days (1)	Non-Film Days (2)	(1)–(2)
Correlation Coefficient	Mean	0.179	0.174	0.005**
				(0.044)
	Median	0.199	0.139	0.060***
				(0.000)
Adj. R-squared	Mean	0.083	0.052	0.032***
				(0.000)
	Median	0.041	0.019	0.022***
				(0.000)

Panel B: Decomposition of the Changes in Correlation Coefficient

	Percentage Contribution			%D in Covariance
	A1	A2	A3	
Mean	125%***	−0.3%	−27%***	0.128***
	(0.000)	(0.985)	(0.000)	(0.000)
Median	126%**	−0.4%	−23%***	0.090*
	(0.000)	(0.975)	(0.000)	(0.052)

The results in this table are derived in a similar manner as those in Table 3, except that the event day t (i.e., film release day) is moved to $t + 1$ trading day. See Table 3 for more detail.

Table A3
Return comovement – vacation month effect.

	Correlation Coefficient		Adjusted R-squared	
	Mean	Median	Mean	Median
Panel A: Vacation Months (June, July, August, September, and December)				
(1) Film Days	0.184	0.190	0.089	0.036
(2) Non-Film Days	0.174	0.139	0.053	0.019
Panel B: Non-Vacation Months (January, February, March, April, May, October, and November)				
(3) Film Days	0.182	0.187	0.086	0.035
(4) Non-Film Days	0.176	0.142	0.051	0.020
(1)–(2)	0.010***	0.051***	0.036***	0.018***
	(0.000)	(0.000)	(0.000)	(0.000)
(1)–(3)	0.002	0.002	0.003*	0.002
	(0.614)	(0.504)	(0.066)	(0.187)
(2)–(4)	−0.002	−0.003	0.002	−0.001
	(0.247)	(0.117)	(0.118)	(0.139)
(3)–(4)	0.007***	0.045***	0.035***	0.015***
	(0.008)	(0.000)	(0.000)	(0.000)

The table compares stock return comovement with the market between vacation and non-vacation months. We define June, July, August, September, and December as vacation months and other months as non-vacation months. We capture the stock return comovement with the market by (1) the time series Pearson correlation of stock excess returns and market excess returns and (2) the adjusted R-squared obtained by regressing the CAPM model. This is done for each firm and each group of (non-)film days separately. We perform the paired t-test to test the mean difference and Wilcoxon signed-rank to test the median difference. We report the p-value in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A4
Trading strategy – equally weighted portfolio returns.

Holding Periods	"Underpriced" Betas					"Overpriced" Betas					Long Underpriced - Short Overpriced Strategy				
	1 (Lowest)	2	3	4	5 (Highest)	1 (Lowest)	2	3	4	5 (Highest)	1 (Lowest)	2	3	4	5 (Highest)
[−2, 0]	−0.002	0.018	0.04***	0.046***	0.059***	0.026	0.042***	0.056***	0.057***	0.076***	0.023	0.060**	0.096***	0.102***	0.136***
	(0.017)	(0.015)	(0.013)	(0.013)	(0.015)	(0.016)	(0.014)	(0.012)	(0.013)	(0.015)	(0.034)	(0.028)	(0.025)	(0.026)	(0.030)
[−2, 1]	0.000	0.021	0.041***	0.048***	0.061***	0.030	0.043***	0.059***	0.061***	0.079***	0.029	0.063**	0.100***	0.108***	0.140***
	(0.017)	(0.014)	(0.013)	(0.013)	(0.015)	(0.026)	(0.014)	(0.012)	(0.013)	(0.015)	(0.033)	(0.028)	(0.025)	(0.026)	(0.030)
[−2, 2]	0.003	0.021	0.043***	0.048***	0.064***	0.032	0.043***	0.058***	0.060***	0.080***	0.035	0.064**	0.101***	0.108***	0.144***
	(0.017)	(0.014)	(0.013)	(0.013)	(0.015)	(0.026)	(0.013)	(0.012)	(0.013)	(0.015)	(0.033)	(0.027)	(0.024)	(0.025)	(0.030)
[−3, 0]	−0.011	0.018	0.036***	0.04***	0.037**	0.011	0.033**	0.049***	0.049***	0.051***	0.001	0.051*	0.085***	0.089***	0.088***
	(0.016)	(0.014)	(0.012)	(0.013)	(0.015)	(0.016)	(0.013)	(0.012)	(0.012)	(0.014)	(0.032)	(0.027)	(0.024)	(0.025)	(0.029)
[−3, 1]	−0.008	0.018	0.037***	0.040***	0.040***	0.015	0.034***	0.049***	0.049***	0.054***	0.007	0.052**	0.086***	0.089***	0.094***
	(0.016)	(0.014)	(0.012)	(0.012)	(0.014)	(0.015)	(0.013)	(0.012)	(0.012)	(0.014)	(0.031)	(0.027)	(0.024)	(0.025)	(0.029)

This table presents the equally weighted abnormal returns of each portfolio, α_p, by regressing its excess returns on the Fama–French five factors using different holding periods. For the "underpriced" ("overpriced") beta portfolios, we long (short) them at the beginning of a holding period and short (long) at the end of the holding period. The last five columns represent the abnormal returns of the long "underpriced" beta portfolio and short "overpriced" beta portfolio in the corresponding quintile. The portfolios are formed corresponding to quintiles of the "underpriced" betas ($\beta_{i,u,t}$), and "overpriced" betas ($\beta_{i,o,t}$), which are estimated by firm by satellite events as follows. For each satellite event on date t, we employ one year data up to 10 days prior to the event (i.e., from $t - 375$ to $t - 10$) to run the following model:
$(Ret_{i,w} - Ret_{f,w}) = \alpha_i + \beta_{i,o,t}\ (Ret_{m,w} - Ret_{f,w})^{*}\mathrm{D}(Ret_{m,w} > 0)^{*}Hollywood_w + \beta_{i,u,t}\ (Ret_{m,w} - Ret_{f,w})^{*}\mathrm{D}(Ret_{m,w} < 0)^{*}Hollywood_w + \beta_1\ (Ret_{m,w} - Ret_{f,w}) + \beta_2 SMB_w +$
$\beta_3 HML_w + \beta_4 RMW_w + \beta_5 CMA_w + e_{i,w}$ (8)
where $Ret_{i,w}$ is the return of firm i on day w ($w = t - 375, \ldots, t - 10$); $Ret_{f,w}$ is the risk-free rate on day w. $Hollywood_w$ is dummy Hollywood event, which receives a value of one on Hollywood film release days and zero on other days within the estimation window. D(.) receives value of one if the logical function is correct and zero otherwise. Controls are the Fama–French five common risk factors: the CRSP value-weighted market excess return, ($Ret_{m,w}$ - $Ret_{f,w}$), and the size (*SMB*), book-to-market (*HML*), operating profitability (*RMW*), and investment (*CMA*) factors. Robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

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