Media and Corporate Bond Market Momentum

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Abstract

This paper investigates whether media makes corporate bond momentum. Using a comprehensive data set of media coverage from RavenPack News Analytics between 2000 to 2020, we find that bonds with high media coverage exhibit stronger momentum than those with low media coverage. This difference cannot be explained by conventional risk factors. Media tone enhances news coverage effect and informed trading of bonds with high media coverage leads to stronger momentum in the short run. Momentum reverses in the long run, and bonds with higher media coverage have a more pronounced reversal. The evidence is consistent with theory of investor overreaction.

JEL classification: D03 G12

Keywords: business media, momentum, corporate bond pricing, overreaction

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1. Introduction

Jegadeesh and Titman (1993) first document the evidence of momentum. Stocks that performed better in the past three to twelve months continue to outperform in the next three to twelve months. Since then, voluminous papers have studied momentum from different perspectives in various asset markets (Asness, Moskowitz, and Pedersen, 2013; Erb and Harvey, 2006), over different time horizons (Chabot, Ghysels, and Jagannathan, 2009; Fama and French, 2008), and in countries with different cultural and institutional background (Rouwenhorst, 1998; Chui, Titman and Wei, 2010; Asness, Moskowitz, and Pedersen, 2013).

While the vast literature focuses on stocks, several papers have studied corporate bond momentum and the evidence is mixed. Gebhardt, Hvidkjaer, and Swaminathan (2005) find no momentum for investment-grade corporate bonds,[1] but instead discover a momentum spillover from stocks to bonds. Jostova, Nikolova, Philipov, and Stahel (2013) find significant momentum in high-yield corporate bonds. Using bond yields instead of returns, Guo, Lin, Wu, and Zhou (2022) uncover significant price momentum for both speculative-grade and investment-grade bonds.

The underlying reasons for momentum have not been fully understood. While there are attempts to provide rational explanations for the momentum effect, the size of the momentum profits (about 12%) appears to be too large to reconcile with rational-based theory. This prompts researchers to turn to behavioral explanations. Theory of underreaction suggests that investors underreact to information, which causes slow diffusion of information into security prices and induces momentum (Barberis, Shleifer, and Vishny, 1998; Hong and Stein, 1999; Fama and French, 2012). Daniel, Hirshleifer, and Subrahmanyam (1998) propose a model in which investors' overconfidence and biased self-attribution generate delayed overreaction to

[1] See also Khang and King (2004).

information and result in momentum. Following the study of Daniel et al. (1998), many papers provide evidence that investor overreaction is the momentum driver (Cooper, Gutierrez, and Hameed, 2004; Chui, Titman, and Wei, 2010; Solomon, Soltes, and Sosyura, 2014; Adebambo and Yan, 2016; Chui, Subrahmanyam and Titman, 2022). This line of research focuses on stock momentum, whereas the sources of bond momentum are considerably understudied. This paper attempts to fill this gap by exploring media coverage as a potential driver of momentum in the corporate bond market.

The existing literature suggests that media play an important role in collecting, processing, and interpreting information, which affects trading and asset pricing (Engelberg & Parsons, 2011; Tetlock, 2007). Hong and Stein (2007) suggest that media shape the behavior of investors and the stock market. Using a comprehensive data set of newspaper articles, Hillert, Jacobs, and Muller (2014) find that firms particularly covered by the media exhibit significantly stronger momentum in the stock market. This finding suggests that media coverage is a powerful force that drives stock momentum. However, it remains unclear whether media coverage and tone may contribute to momentum in the corporate bond market.

To address this issue, we employ media coverage and tone data from RavenPack. Following Hong, Lim, and Stein (2000), we rely on a residual media coverage measure from the cross-sectional regression that controls characteristic variables known to affect the likelihood of a firm being covered by media. The momentum strategies are constructed in the same way as Jegadeesh and Titman (1993), and the media coverage (tone) is accumulated (averaged) during the portfolio formation period. Our results show that in the short- and mid-term runs, the momentum is significant for bonds with high media coverage but insignificant for bonds with low media coverage. The difference in momentum returns between the high and low coverage portfolios, which we refer to as media-based momentum, is significant up to a 12-month holding horizon. The media-based momentum cannot be explained by standard risk factors and is robust to using different variables to calculate the residual media coverage. The media-based momentum is much stronger for non-investment-grade (NIG) bonds.

We conduct additional tests to evaluate whether investors' overreaction to media news is the primary reason underlying the media-based momentum. First, we check whether the momentum dynamics driven by media coverage exhibit a predictability pattern consistent with price overreactions to news. The model of Daniel et al. (1998) predicts that the momentum effect will reverse in the long run as investors adjust their beliefs when further public information draws the price back toward fundamentals. To test this hypothesis, we examine the momentum return holding portfolios over various horizons from t+1 to t+12 (mid-term) and t+13 to t+24 (long term) respectively. The results show that both the full sample and NIG bonds exhibit significant media-based momentum in the mid-term but a reversal in the long term. These results are consistent with the overreaction hypothesis.

Second, if overreaction drives the media-based momentum, media tone, which can enhance investors' emotions, should also play a significant role in this process. To investigate this possibility, we add media tone as another predictor in portfolio sorts. If winners (losers) have a positive (negative) media tone during the portfolio formation period, investors will likely be even more overconfident, leading to stronger and more persistent momentum. Consistent with this inference, we find that bonds with positive media tone have higher momentum.

Finally, for an informed but overconfident investor, if subsequent public information confirms his private information, it will trigger further overreaction due to self-attribution bias. To test this hypothesis, we employ the method of Li and Galvani (2021) to classify bonds into top and non-top groups using volumes of institution-sized trades as a proxy for informed/uninformed trading. Compared with the private information held by informed investors, media coverage is more like public information. In the short- and mid-term, high media coverage can trigger further momentum for informed trading. However, in the long run, informed trading with high media coverage has a stronger reversal than uninformed trading. Our results confirm this predictive pattern. Overall, there is strong evidence that media coverage generates momentum through investors' overreaction and self-attribution bias.

This paper contributes to the literature of momentum in financial markets. While there are a few studies on bond momentum, little is known about the underlying forces for this phenomenon. Given that the corporate bond market is a major financing platform for firms, with a market cap roughly equal to equities, it is important to understand the pricing mechanism and efficiency in this market. Corporate bonds are in many ways different from stocks, such as investor clientele, security characteristics, liquidity, and the information environment. Investigating this large asset class can provide important out-of-sample evidence unavailable in tests based on stocks. This paper contributes to the current literature by providing evidence that business media are important for bond momentum. We find that bond momentum behaves quite differently from stock momentum, and the sources of the observed momentum in the corporate bond market also differ from the stock market.

The remainder of this paper is organized as follows. Section 2 discusses data and variables. Section 3 presents empirical results and conducts robustness tests. Section 4 explores the mechanism behind the media effect on momentum, and Section 5 provides additional tests. Finally, Section 6 summarizes the findings and concludes the paper.

2. Data and variables

We obtain the bond issue, issuer, and transaction data from the Fixed Investment Securities (FISD), the enhanced Trading Reporting and Compliance Engine (TRACE), and the National Association of Insurance Commissioners (NAIC). Media information is collected from RavenPack. Firm characteristics data, such as firm size, book-to-market, turnover, and analyst coverage, are collected from the Center for Research in Security Prices (CRSP), Compustat, and I/B/E/S.

2.1 *Corporate bond data*

The issue- and issuer-specific information of corporate bonds are from the FISD database. FISD includes issuance information for all fixed-income securities with a CUSIP, containing issue- and issuer-specific information, such as issue date, coupon rate, maturity, issue amount, and credit ratings. Following the method of Jostova et al. (2013), we eliminate non-US dollar-denominated bonds, bonds with unusual coupons (e.g., step-up, increasing-rate, pay-in-kind, and split-coupons), bonds backed by mortgages or other assets, and bonds that are part of unit deals. We also eliminate bonds with a call or put option. For bond ratings, we use Moody's ratings primarily, and if unavailable, we use Standard and Poor's (S&P) ratings when possible.

Bond transaction data are collected from two databases: TRACE and NAIC. The enhanced TRACE database provides transaction data of publicly traded corporate bonds since July 2002. The NAIC database contains transaction data of publicly traded corporate bonds by life and property and casualty insurance companies and health maintenance organizations (HMOs) from January 1994 to December 2009. For transactions before July 2002, NAIC is the only data source, and after July 2002, TRACE and NAIC data are used simultaneously. If transactions of the same bond are covered in both datasets, we keep only those reported by TRACE. Both

TRACE and NAIC provide daily transaction data. We clean the TRACE data following the procedure of Dick-Nielsen (2014) and remove transactions that are marked as cancellations, corrections, and reversals. In addition, we eliminate bond transactions labeled as when-issued, locked-in, or with special sales conditions. We also remove transaction records with a trading volume of less than $10,000. Private bonds or bonds issued by private firms are dropped.

We obtain firm characteristics data, such as firm size, book-to-market, and turnover, from the Center for Research in Security Prices (CRSP) and Compustat. Analyst coverage data are collected from I/B/E/S. The monthly corporate bond return at month *t* is computed as:

$$r_t = \frac{(P_t + AI_t) + C_t - (P_{t-1} + AI_{t-1})}{P_{t-1} + AI_{t-1}} \qquad (1)$$

where P_t is the price, AI_t is the accrued interest, and C_t is the coupon payment, if any, in month *t*. We use the last daily price of each month to calculate the bond's monthly returns, and the price of the last trading in each day is used to proxy for the daily price. If there is no trading in month *t* or month *t-1*, the monthly return of time *t* is set to missing.

2.2 Media coverage and media tone

Media coverage and tone are the key variables in this paper, collected from RavenPack News Analytics-Dow Jones Edition. The Dow Jones Edition of RavenPack analyzes relevant information from Dow Jones Newswires, regional editions of the Wall Street Journal, Barron's, and MarketWatch. It has published the world's business and financial news since January 1, 2000, which is also the starting point of our sample period. Following Bushman, Williams, and Wittenberg-Moerman (2017), we limit the news type to full articles (a news article composed of both a headline and one or more paragraphs of mostly textual material) to ensure the news contains practical information about the entities. We further restrict our sample data with a relevance score of 80 and above. According to the user guide of RavenPack, the relevance score indicates how strongly related the entity is to the underlying news story. Values above 75 are considered significantly relevant.[2] We count the number of articles about an entity and take ln(1+number of articles) to proxy for the media coverage of a firm. All bonds issued by the same firm then share the common media coverage and tone information. To measure media tone, we use CSS (composite sentiment score) provided by RavenPack. CSS ranges between 0 and 100, representing a given story's news sentiment by combining various textual analysis techniques. Since we care about the direction instead of the magnitude of sentiment, media tone is calculated as (CSS-50)/50, which ranges from -1 to 1. Media tone > 0 means the news is positive; media tone < 0 means the news is negative, and media tone = 0 means the news is neutral.

[Insert Table 1 here]

Table 1 examines the determinants of media coverage using Fama-MacBeth regressions. Consistent with previous literature results, firm characteristics significantly affect media coverage. We need to control these factors to spill out noisy impacts. We choose model IV as our baseline model to calculate residual media coverage because it combines the advantages of including key factors and simplicity. This model is also closely consistent with approaches used in prior research. For example, Hong, Lim, and Stein (2000) use firm size and NASDAQ membership as explanatory variables to calculate residual analyst coverage. Hillert, Jacobs, and Müller (2014) employ firm size, analyst coverage, NASDAQ membership, and S&P 500 dummy to calculate residual media coverage. We also test residual media coverage measured by other models, and the results are robust. Model IV can be written as

$$\begin{aligned}\text{Raw media coverage/Raw media tone} \\ = \alpha + \beta_1 \cdot \text{firm\_size} + \beta_2 \cdot \text{analyst\_coverage} + \beta_3 \cdot \text{NASDAQ} + \varepsilon_{\text{media}}\end{aligned} \quad (2)$$

where raw media coverage is ln(1+no. news), firm_size is ln(1+market capitalization),

[2] Limiting data with relevance score of 90 and above or 100 produces similar results.

analyst_coverage is ln(1+no. earnings estimates), NASDAQ is 1 (0) if the issuer is (not) a NASDAQ membership. Residual media coverage is the residual from the regression, and residual media tone is calculated in the same way.

2.3 Sample description

We combine corporate bond data described in section 2.1 and media coverage data in section 2.2 together. The sample period ranges from January 2000 to December 2020. There are 144,284 bond-month observations, with 2,631 bonds issued by 979 firms.

Panel A of Table 2 displays the descriptive statistics of the sample. Panel B reports the time-series averages of the monthly mean of firm and bond characteristics for tercile portfolios based on raw/residual media coverage. Each month, bonds are sorted into tercile portfolios based on cumulative raw/residual media coverage over the past 6 months. The distributions of firm size, analyst coverage, and NASDAQ dummy show that firm characteristic differences across the raw media coverage portfolios significantly decrease with residual media coverage. For example, the firm size difference between high and low portfolios is 2.68 for raw coverage and 1.93 for residual coverage. The t-value also decreases from 71.08 to 46.85. The results show that residual media coverage can help spill out noisy impacts. The relation between media coverage and bond characteristics is informative. Both raw and residual media coverages are negatively related to bond ratings, age, and coupon, while positively related to bond maturity and issue size. This indicates that the media tends to pay more attention to bonds with better ratings, lower coupon rates, longer maturity, larger issue size, and being more recently issued.

[Insert Table 2 here]

3. Empirical results

3.1 Baseline results

We construct momentum portfolios following Jegadeesh and Titman (1993), except that we use average monthly return instead of cumulative return during the formation period to identify losers and winners. This is because bond transactions are less frequent than stocks and quite a few bonds do not have transactions in some months. Following the bond literature, we set both the formation and holding period to six months and skip one month in between. Residual media coverage is calculated using (2). In each month, we first sort all bonds into terciles based on the cumulative residual media coverage in the formation period, yielding low, medium, and high coverage portfolios. Then within each coverage tercile, bonds are further sorted into three groups based on average monthly returns in the past 6 months, with winners (losers) ranking above the 70th percentile (below the 30th percentile). Finally, we construct a momentum portfolio by longing the winners and shorting the losers. Momentum return (or profit) is the return spread between winners and losers. Panel A of Table 3 shows the results, where J/K=6/6 indicates both the formation period J and holding period K is set to 6 months. Coverage portfolios 1, 2, and 3 represent the lowest, medium, and highest portfolios. Return spread 3-1 is the return difference between coverage portfolio 3 and 1.

[Insert Table 3 here]

Panel A of Table 3 shows that the momentum profits monotonically increase with residual media coverage. The high coverage portfolio has the highest and most significant momentum return of 0.18 (t=2.26). The medium coverage portfolio has the second highest momentum return of 0.13, which is significant at the 10% level (t=1.76), whereas the low coverage portfolio has an insignificant momentum return. The momentum return difference between high- and low-coverage portfolios, defined as media-based momentum in the remainder of the paper, is 0.28 and highly significant (t=3.59). Also, for losers and winners, the return differences between high- and low-coverage portfolios are -0.18 (t=-3.41) and 0.10 (t=1.84), respectively, indicating that winners (losers) with more media coverage tend to have higher (lower) future returns than winners (losers) with less coverage. A possible reason is that bonds with higher coverage catch more investors' attention. The past performances of winners and losers are more likely in the market's spotlight. As a result, more investors chase winners while abandoning losers, yielding dispersed future returns.

Panel B of Table 3 shows that media-based momentum is robust in controlling for risk factors. Following Jostova et al. (2013), we regress media-based momentum on bond risk factors. MKT, SMB, and HML are retrieved from Ken French's website. The default spread (DEF) is the difference between long-term investment-grade and government bonds' monthly returns. The long-term investment-grade bond returns are based on a value-weighted portfolio that includes all investment-grade bonds in our sample with at least ten years to maturity. The term spread (TERM) is the difference between the monthly return of the long-term government bond and the one-month T-bill rate, both from the Federal Reserve Board. $\Delta TERM_t = (TERM_t - TERM_{t-1})$, $\Delta DEFt = (DEF_t - DEF_{t-1})$, $mTERM_t = \Delta TERM_t / (1+TERM_{t-1})$, $mDEF_t = \Delta DEF_t / (1+DEF_{t-1})$.

Using GMM with Newey-West adjusted standard errors, we estimate alphas using the following model:

$$\text{media based momentum}_t = \alpha + \boldsymbol{\beta}' \cdot \mathbf{F}_t + \varepsilon_t \tag{3}$$

where media-based momentum is the return difference between high- and low-coverage portfolios. F_t contains risk factors in different models as described in table 3. Panel B shows that alphas in different models are significant at the 10% level. The value ranges from 0.277 to 0.294, which is close to the media-based momentum in panel A. The results suggest that momentum returns associated with media coverage cannot be explained by conventional risk factors.

Panel C of Table 3 shows the media-based momentum returns when the portfolio holding period is set to 4, 8, and 12 months, respectively. Alpha is the intercept of media-based momentum regressed by multi-factor models. For brevity, only the result of model (7) is displayed. Without special statement, all the Alphas in the remainder of the paper are calculated in this way. Media-based momentum persists up to a 12-month horizon. Though the magnitude of media-based momentum declines from 0.32 to 0.20 when the portfolio is held for 4 months to 12 months, the significance stays quite strong even at 12 months (t=3.06). The contributing power of low and high coverage groups to media-based momentum vary across different holding period. In the short-term, high media coverage is the primary source of media-based momentum. The media-based momentum over a 4-month holding horizon is 0.32 (t=4.01). The momentum return for the high coverage portfolio is 0.23 (t=2.79), which accounts for 72% of the media-based momentum return. In the mid-term, both high coverage momentum and low coverage reversal contribute to the media-based momentum. For example, for the 12-month holding horizon, high coverage momentum is 0.09 (t=1.46), and low coverage reversal is -0.10 (t=-2.10). They contribute almost equally to the media-based momentum return.

3.2 Robustness checks

We begin by testing whether our results are robust to different methods of calculating residual media coverage. In our base model, we use firm size, analyst coverage, and NASDAQ dummy as explanatory variables to calculate residual media coverage. To see if results are sensitive to different regression models, we use the unadjusted media coverage as the benchmark and modify the specification in (2) by including different independent variables.

Panel A of Table 4 reports the results. Alphas are again estimated by the GMM with Newey-West adjusted standard errors. Initial media-based momentum is the raw momentum difference between high- and low-coverage portfolios with the use of different residual coverage calculations. When we use the unadjusted (raw) media coverage, alphas are significant at the 10% level. This is consistent with the literature that raw media coverage contains noise that can weaken the information signal. To see the role of different variables in refining the signal, we remove one or two explanatory variables at a time from the base regression in (2). When adjusting the raw media coverage by firm size and analyst coverage, alphas become more significant, with t-values increasing to 2.14 and 2.24 separately. The results reveal the benefit of reducing noise and increasing the precision of the media coverage signal by adjusting for the characteristic effect. When controlling for the effects of both firm size and analyst coverage, alphas remain significant at the 5% level. When we further control for the book-to-market ratio (BTM) effect, the level of significance for alphas falls back to 10%.

[Insert Table 4 here]

The literature has shown that bond characteristics can affect bond returns. In panel B, we investigate whether bond characteristics, such as maturity, age, rating, and issue size, may absorb the media's effect on bond momentum. To start with, we calculate the bond characteristic-adjusted return. Each month, we split the bonds into deciles based on one bond characteristic. The characteristic-adjusted returns are computed as the individual bond return minus the average return of the characteristic decile to which the bond belongs. Momentum portfolios are constructed similarly to Table 3, except that it's based on the characteristic-adjusted return. As is shown in panel B of table 4, though the momentum returns vary slightly when the return is adjusted by different characteristics, the patterns of media effect on bond momentum are in line with the baseline results. If there is any difference, the media-based returns of winners and losers contribute somewhat differently to the media-based momentum. For example, the media-based momentum of maturity- and age-adjusted returns are 0.27 and 0.26, respectively. Positive media-based returns of winners and negative media-based returns of losers both have significant contributions to the media-based momentum, which is similar to the pattern of the baseline results. However, the situation for rating-adjusted and amount outstanding-adjusted is somewhat different. Media-based momentum of rating-adjusted returns is 0.20, and about 65% of the profit comes from the positive media-based return of losers. Almost contrarily, the media-based momentum of the issuance amount-adjusted returns is 0.24, of which 63% comes from the positive media-based return of winners. Notwithstanding these differences, the media effect on momentum is robust to the bond characteristic adjustment.

3.3 Bond rating and media-based momentum

Prior research shows that ratings play an important role in anomalies. In light of the literature, we examine the effects of ratings on momentum. In each month, bonds with ratings are sorted into 2 groups: bonds rated at or above BBB- are classified as Investment Grade (IG), while those rated below BBB- are classified as Non-Investment Grade (NIG). Within each rating group, we first sort all bonds into terciles based on the cumulative residual media coverage during the past six months. Then within each coverage tercile portfolio, bonds are further sorted into three groups based on average monthly returns in the past six months, with winners (losers) ranking above the 70th percentile (below the 30th percentile). Panel A in Table 5 shows the average monthly return for IG and NIG bonds are 0.60% and 1.62%, respectively. Bonds with high credit risk have high returns. The average monthly residual media coverage is 2.98 for IG bonds and 2.16 for NIG bonds.

[Insert Table 5 here]

Panel B of Table 5 shows that IG bonds have no significant momentum for each media coverage portfolio, and the media-based momentum is also insignificant. In sharp contrast, for NIG bonds, high coverage portfolio has a significant momentum return of 0.57 (t=2.33). This result is consistent with the finding of Jostova et al. (2013). More importantly, the media-based momentum is significant, with an average monthly momentum return of 0.73%. The media-based momentum is concentrated in NIG bonds.

Moreover, the results continue to show that high media coverage is the main source of bond momentum for NIG bonds. A novel finding for NIG bonds is that the media-based momentum is driven by the positive 3-1 return spread between the high and low coverage portfolio of winners (0.81, t=3.58). In contrast, losers only have a small insignificant negative media-based return of -0.04 (t=-0.17). While Table 3 shows that the full media-based momentum is caused by both the positive return spread of winners and the negative return spread of losers, Table 5 shows that the positive effect of high coverage on winners is more pronounced for NIG bonds. The different tendency of IG and NIG bonds persists till 12-months horizon.

3.4 Cross-sectional regression tests

The portfolio analysis shows that momentum returns monotonically relate to residual media coverage and high coverage portfolio is the driver of media-based bond momentum. To substantiate this finding, we next perform cross-sectional regressions with better controls for characteristics and other effects. Table 6 reports the results of OLS regressions. The dependent variable is the forward returns from months t+1 to t+6. The explanatory variables include $r_{t-6,t-1}$, which is the past six-month return from month t-6 to t-1, and $dum\_high/low_{t-6,t-1}$, which equals 1 if the cumulative residual coverage of the bond during the past 6 months ranks in the high/low coverage portfolio and 0, otherwise. Control variables include bond and firm characteristics.

[Insert Table 6 here]

With different regression model setting, the coefficient of $r_{t-6,t-1}$ is significantly positive indicating that the average monthly returns of bonds during the past 6 months positively correlate with the future 6 month returns. The results show evidence that momentum exists in the corporate bond market. The coefficient of dum_high$^*r_{t-6,t-1}$ is of primary interest as it represents the effect of high media coverage on bond momentum. As shown, the coefficient is positive and highly significant. Compared with dum_high$^*r_{t-6,t-1}$, the coefficient of dum_low$^*r_{t-6,t-1}$, is somewhat different. Dum_low$^*r_{t-6,t-1}$ carries a significant negative coefficient. The results suggest that bond momentum effects disperse with media coverage levels. High media coverage can significantly enhance the momentum effect, while low media coverage decreases momentum. This evidence is consistent with the finding of portfolio analysis.

4. Economic mechanism

In this section, we conduct more tests to explore the channels through which media coverage drives bond momentum. We show that the media coverage effect is more consistent with the theory of overconfidence, self-attribution, and security market overreaction proposed by Daniel, Hirshleifer, and Subrahmanyam (1998).

4.1 Long-term reversal

Tests based on long-term reversals help distinguish between overreaction and underreaction-explanations of momentum. If overreaction is the main driver of media-based momentum, then bonds that attract high media coverage should experience a higher momentum peak in the short term and a more pronounced reversal in the long term. This is because high coverage will attract more investor attention and enhance investors' overreaction in the short term, which in turn will exert more downward pressure on the return in the long term when more public information about firm fundamentals is released. We thus follow the literature of information reaction and analyze momentum profits for up to 24 months after portfolio formation. In each month, the momentum strategies are constructed in the same way as in Table 3. The formation period is set to 6 months and the portfolios are held for three horizons from month t+1 to t+12, and from t+13 to t+24.

[Insert Table 7 here]

Panel A of Table 7 shows that the media-based momentum exists for the full sample when the holding period is from month t+1 to t+12. However, when we divide the sample into IG and NIG groups, we find that only NIG bonds exhibit media-based momentum. In contrast, IG bonds exhibit return reversal rather than momentum.

Panel B of Table 7 shows the results in the long term from month t+13 to t+24. The momentum return is negative for the full sample as well as IG and NIG subsamples with the high coverage portfolio showing a stronger reversal. These results are consistent with media coverage enhancing investors' overreaction, which induces short- and medium-term momentum. But in the long term, momentum turns to reversal when more public information arrives, investors adjust their expectations, and prices pull back toward fundamentals.

4.2 Tone-enhanced media-based momentum

If overreaction drives media-based momentum, media tone should reinforce this effect. If winners (losers) get a positive (negative) media tone during the formation period, investors will be even more overconfident about their judgment and abilities. Therefore, media tone can enhance the media-based momentum effect.

[Insert Table 8 here]

To investigate this possibility, we add media tone as an additional sorting variable. Each month, we sort sample bonds into 3x3 portfolios based on media coverage and returns in the past 6 months in the same way as baseline analysis. When computing momentum returns, we add media tone into consideration. Specially, we calculate two momentum returns to investigate the media tone effects. The first momentum return is calculated as the return of winners with a positive tone *minus* the return of losers with a negative tone, which we refer to as PWNL momentum. The second momentum return is calculated as the return of winners with a negative tone *minus* the return of losers with a positive tone, which we refer to as NWPL momentum.

Panel A of Table 8 reports the results for J/K=6/6. The results show that high coverage portfolio has significant PWNL momentum (0.40, t=2.45) but insignificant NWPL momentum (0.04, t=0.28). The results are similar for media-based momentum: 3-1 return for PWNL momentum is 0.41 (t=2.06) while 0.02 (t=0.12) for NWPL momentum. Compared with the baseline results in Table 3, both the high coverage momentum and media-based momentum are much higher for PWNL momentum.

Panel B of Table 8 reports the effect of media tone in the short- and mid-term run, while panel C displays the results in the long-term run. Comparing PWNL and NWPL, we can find that media-based momentum of PWNL is significant and persistent in the short- and mid-term run, and turns to deep reversal in the long run. However, the effect of media coverage on momentum is always insignificant for NWPL either in the short- and mid-term run, or in the long run. Compared with the baseline results, where the media tone effect is missing, PWNL shows a higher peak of momentum in the short- and mid-term run, and turns to deeper reversal in the long run. Specifically, according to panel C of table 3, media-based momentum of the baseline reaches 0.32 (t=4.01) at K=4. With the enhancement of media tone, media-based momentum of PWNL is 0.48 (t=2.64) during the same holding period, which is much higher than the baseline.

Panel B of table 7 indicates that when the portfolio is held from t+13 to t+24, return spread 3-1 of the baseline gets to a reversal of -0.41 (t=-4.91). Panel C of table 8 shows that PWNL has a much deeper reversal of -0.71 (t=-3.39) under the same holding condition. The results provide evidence that media tone can enhance the media-based momentum effect.

4.3 Overconfidence and biased self-attribution

Daniel et al. (1998) document that an informed but overconfident investor will overreact to his private signal. If subsequent public information confirms this signal, it will trigger further overreaction due to self-attribution bias and result in price momentum. Li and Galvani (2021) propose that informed trading lies at the core of the momentum effect for corporate bonds. They split the firm-level bond cross-section into top (non-top) bonds characterized by higher (lower) volumes of institution-sized trades. They find that top bonds exhibit more informed trading and transmit information faster than non-top bonds. Also, fast news spreading yields short-lived momentum in top bonds, whereas momentum in non-top bonds is drawn out (long-lived) due to slow information diffusion. Built on these studies, we use informed trading to proxy for private signals in the corporate bond market and consider media coverage as public information. For informed trading, high media coverage which confirms the private signal can trigger further momentum. In the long run, informed trading with high media coverage should also have a deeper reversal than uninformed trading to compensate for the overreaction effects.

To see if this is the case, we use bivariate portfolio sorts. We identify firm-level top (non-top) bonds following the method of Li and Galvani (2021). In each month and for each firm, the bond with the highest monthly trading volume of institution-sized trade is identified as the top bond of the firm. Other bonds issued by the same firm, with or without institution-sized trades, are all classified as non-top bonds. Institutional trades are trades with a par value >= $500,000. When constructing the top bond momentum strategy, we identify bonds that have been top bonds over the past 6 months. Then the top bonds are sorted into terciles based on cumulative residual media coverage during the formation period. Finally, bonds are further sorted into losers, medium, and winners within each coverage group based on past six-month returns. The momentum portfolio for non-top bonds is constructed analogously.

[Insert Table 9 here]

The results are displayed in Table 9. Panel A compares the momentum effect between top and non-top bonds when J/K=6/6. An interesting finding is that the media-based momentum is mainly caused by the positive return of winners for top bonds, while there is a negative return of losers for non-top bonds. Therefore, higher media coverage plays a more important and positive role in winners' return for top bonds that contain more private information. But for non-top bonds, higher media coverage has no significant effect on the return of winners and even pushes down losers' return.

Since we are interested in the momentum trends of top/non-top bonds in the short- and long-term, we split the momentum returns into two parts: holding the portfolios from t+1 to t+K (K=4, 8, and 12, Panel B) and from t+13 to t+K (K=16, 20, and 24, Panel C). The results confirm our hypothesis. Panel B shows that top bonds have more significant and persistent high coverage and media-based momentum in the short- and mid-term than non-top bonds. One reason is that top bonds contain more informed trading. High media coverage disseminates public information, confirming investors' private information and triggering higher and further momentum. However in the long run, with investors adjusting their beliefs, the higher momentum induced by high media coverage should turns to more sharped reversal. Results in panel C show that this is indeed the case. According to panel C, though both top and non-top bonds turn to have reversal in the long run, both the magnitude and significance of reversal for top bonds are greater than non-top bonds. For example, when the portfolio is held from t+13 to t+16, the high coverage portfolio of top bonds gets reversal return of -0.29 (t=-2.81), lower than the return of non-top bonds (-0.26, t=-3.28). Return spread 3-1 for top bonds is -0.27 (t=-2.28), which is also lower than that of non-top bonds (-0.21,t=-2.55). These results provide evidence that the more profound reversal of top bonds in the long term compensates investor overreaction and biased self-attribution in the short term.

5. Additional tests

5.1 Subsample analysis: market states, media effect, and momentum

The literature suggests that momentum returns in the equity and corporate bond market are state-dependent (Cooper, Gutierrez, and Hameed, 2004; Li and Galvani, 2018). Li and Galvani (2018) find that momentum gains exclusively follow the market upturn. In contrast, down markets herald momentum losses. They document that the strong predictive power of the market state can be attributed to its influence on investors' overconfidence, which originates the momentum effect. In this section, we investigate the media coverage effect on momentum under different market states.

Following Li and Galvani (2018), we define a month as being in the Up (Down) market state if the average monthly market return over t-12 to t-1 is above or equal (below) the average market return over January 2000 to t-1. The earliest objective month is January 2001, 12 months away from the starting month of our sample period. Among a total of 240 months, there are 74 Up and 166 Down months. For each month, we construct a momentum strategy based on residual media coverage and past returns using the same method as our baseline analysis. The holding period is set to six months.

[Insert Table 10 here]

Results show that the media effect on bond momentum still holds with the consideration of market states. As shown in panel A of Table 10, the high coverage momentum for the Up market is 0.55 and significant at the 1% level (t=4.02). While for the Down market, the momentum is insignificant. The media-based momentum shows a similar pattern: The Up market has a significant return of 0.46 (t=3.11), while the Down market has only a slightly significant return of 0.16 (t=1.68). The media coverage effect on momentum is more pronounced and significant for the Up market.

Panel B of Table 10 shows that in the Up market, both the high coverage and media-based momentum are more persistent. In the Up market, the high coverage portfolio still has strong and significant momentum of 0.53 (t=4.73) when K=12.

5.2 Firm-level analysis

The number of bonds issued by firms exhibits a large cross-sectional dispersion. Bonds issued by the same company are exposed to the same fundamentals, information flows, and firm-specific risk and tend to co-move with each other. This raises a concern that our empirical results could be mechanically influenced by multiple bonds issued by the same firm. To address this concern, we redo our tests based on a sample constructed at the firm level. Each month, we only keep one bond with the largest issue size for each issuer. We keep the most newly issued if there are multiple bonds with the same issue size. The momentum strategies are constructed in the same way as in our baseline analysis.

[Insert Table 11 here]

Table 11 shows that the media coverage effect on momentum continue to hold at the firm level. There are several differences between the results at the bond-level and firm level. First, at the firm level, the media-based momentum is dominated by the positive media-based return of winners, but at the bond level, it's driven by both the positive media-based return of winners and the negative media-based return of losers. For example, at the firm level, the media-based return is 0.39 (t=4.99) for winners and -0.00 (t=-0.04) for losers. The media-based momentum is 0.39 (t=3.28). In comparison, at the bond level in Table 3, the media-based momentum is 0.28. The media-based return for winners and losers are 0.10 (t=1.84) and -0.18 (t=-3.41), respectively. Both have a contribution to the media-based momentum. Second, the high-coverage momentum is more persistent at the firm level. The momentum return for the high-coverage portfolio is still significant at the firm level (0.21, t=2.44) when K=12, while it is insignificant at the bond level over the same holding period.

5.3 Buy-side competition, media effect, and momentum

Hoberg, Kumar, & Prabhala (2022) use a novel measure of buy-side competition to explain momentum profits in the equity market. They find that the momentum quintile spread is 1.11% when competition is low and negligible when competition is high. They suggest that slow information diffusion explains the large momentum spreads in low-competition markets. To control the potential impact of competition, we add a buy-side competition factor to our analysis. We construct the measure of buy-side competition using the method of Hoberg, Kumar, and Prabhala (2022). We collect the quarterly fund holding data from Thomson Reuters - eMAXX database. The exact computations of buy-side competition are as follows.

a. Bond momentum z-score: in each month t and for each bond j, we normalize the average monthly return in the past six months $r_{j,t-6,t-1}$ into z-scores, where $z_{j,t} = \frac{r_{j,t-6,t-1} - \overline{r}_t}{\sigma_t}$, where $\overline{r}_t$ and σ_t denote the cross-sectional mean and standard deviation, respectively.

b. Fund momentum z-score: A fund f's z-score is the value-weighted z-score of its holdings in the nearest quarter prior to t. $z_{f,t} = \sum_{j=1}^{n} w_{f,j} \times z_{j,t}$, where $w_{f,j}$ denotes fund f's weight in bond j, and n is the number of bonds the fund holds.

c. Peers: Fund f's rivals [$p_{f1}, p_{f2}, ..., p_{fm}$] are the m funds for which the Euclidean distance $d_{f,f_{pi,t}} < d^*$, where $d_{f,f_{pi,t}} =| z_{pi,t} - z_{f,t} |$, and d^* defines a target granularity. Following the literature, we set d^*=0.05 here and find alternative values produce similar results.

d. Competition faced by a fund: The competition faced by fund $c_{f,t}$ is the summed pairwise similarity between the fund f and its rivals. $c_{f,t} = \sum_{i=1}^{m} s_{f,p_{fi},t}$, where $s_{f,p_{fi},t}$ is the pairwise similarity between fund f and a rival p_{fi}, $s_{f,p_{fi},t} = (D_t - d_{f,p_{fi},t})$ and $D_t = \underset{\forall f_i, f_j (i \neq j)}{argmax} d_{f_i, f_j, t}$. Higher total similarity indicates more intense competition.

e. Bond-level competition: For a bond j at time t held by q funds, the point-in-time bond -specific competition $C_{j,t}$ is the equal-weighted average of the fund-level competition averaged over the set of q funds: $c_{j,t} = \sum_{k=1}^{q} \frac{c_{f_k,t}}{q}$. To avoid look-ahead bias, the final bond-level competition is the 6-month average of monthly competition values lagged one quarter before the month under consideration, that is, $COMP_{j,t} = \frac{\sum_{m=3}^{8} c_{j,t-m}}{6}$.

Each month, we first sort bonds into terciles based on their buy-side competition. Bonds in the highest (lowest) decile are classified as high (low) competition portfolios. Then within each competition portfolio, bonds are further sorted into tercile based on residual media coverage. Finally, bonds are sorted into losers, medium, and winners within each coverage portfolio based on the past six-month return.

[Insert Table 12 here]

Table 12 shows that the media effect on momentum only holds for low-competition portfolios. As is shown in panel A, the low competition group has a significant high-coverage momentum of 0.37 (t=2.96) and media-based momentum of 0.45 (t=3.01). But neither of these two momentums is significant for the high-competition group. This tendency is robust to multi-factor models (panel B) and persists till holding the portfolio for 12 months (pane C). In the spirit of Hoberg, Kumar, & Prabhala (2022), we expect that for bonds with low competition, investors are more diversified in their investment strategies, so information diffusion is slower, and the self-confidence friction of investors makes room for media coverage to take effect. Our results are consistent with this interpretation.

5.4 Different media types and momentum

RavenPack classifies news articles into three types: news flash, full article, and press release. The news flash refers to news articles composed of a headline and no body text. The full article refers to news articles composed of both a headline and one or more paragraphs of mostly textual material. The press release refers to corporate announcements originated by an entity and distributed via a news provider. Different media types can affect capital markets differently in a non-mutually exclusive way. First, some news only disseminates firm-generated information broadly whereas others can create new information for market participants (Drake, Guest, and Twedt, 2014). Second, the information source matters. Empirical evidence suggests that investors consider business press articles a more credible source of information than analyst reports or firm disclosures (Drake et al., 2014; Kothari, Li, and Short, 2009). In the preceding analysis of this paper, media coverage is calculated using only full articles. Full articles can be considered a media type generated from the business press, creating new information instead of merely disseminating information. Both news flash and press releases are media types that only disseminate information without much new information creation. To see if different media types produce different momentum effects, we use the number of news flashes or press releases to calculate residual media coverage.

[Insert Table 13 here]

The results are reported in Table 13. Panel A shows that the average bond-month residual media coverage for news flash and press releases are 4.49 and 4.70, respectively, both higher than 2.71 for full articles. Panel B shows that media-based momentum is strongly significant for news flash up to K=12 and turns into reversal when K=24. But for press releases, the media-based momentum is only slightly significant even at K=4 (0.16, t=1.82) and becomes insignificant at K=6. For high-coverage momentum, though it is significant up to K=6 for both news flash and press release, the magnitude for news flash is higher than for press release. Moreover, the momentum profit for news flash and press releases is much lower and less persistent than in the baseline results using the full article. This is not surprising since full article news contains new information and originates from business press instead of firms. Though news flash creates little new information, it reflects business media's choosing, filtering, and concentration process. In contrast, the press release is solely the broadcasting channel for news originating from firms. This explains why a full article has the strongest effect on investors, while the press release has the weakest effect.

6. Conclusion

Though momentum has been a long-lasting anomaly in the stock market, the sources of this phenomenon are still unclear. Past studies focus on stock momentum phenomenon while the literature on bond momentum is relatively small. Our paper fills in this gap by studying momentum in the corporate bond market from the media perspective.

Our results show that the momentum for bonds with high media coverage is significant whereas it is insignificant for bonds with low coverage. This pattern also holds for NIG bonds, which have significant momentum before considering the effect of media coverage. The results are robust to controlling for risk factors and different residual media coverage calculations. Further analysis shows that investors' overreaction to information is the main mechanism through which media generates momentum. This finding is consistent with the prediction of the model developed by Daniel, Hirshleifer, and Subrahmanyam (1998). We evaluate the overreaction explanation from three aspects. First, we extend the holding period to 24 months and find that the media-based momentum reverses in the long term. This is strong evidence supporting the overreaction hypothesis. Second, exploiting the effect of media tone, we find that media tone enhances investors' overreaction, resulting in higher and more persistent media-based momentum. Finally, we classify informed and uninformed trading to differentiate trades with more or less private information. The results suggest that media coverage enhances investors' overreaction to their private information, which induces longer-lasting momentum in the short and mid-term and a more profound reversal in the long term.

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Table 1. Multivariate regressions to explain media coverage

This table reports the Fama-Macbeth (1973) regression results to explain media coverage. The sample period is 2000.01-2020.12. The dependent variable is media coverage, defined as log(1+no. news). Firm size is defined as log(1+market capitalization). Analyst coverage is calculated as log(1+no. Earnings estimates). NASDAQ dummy is a dummy variable that equals 1 (0) if the firm is (not) listed on NASDAQ. Book-to-market is the firm's equity book-to-market ratio. Turnover is the natural log of the average daily turnover of issuers' stock over the past six months. Daily turnover is calculated as share volume/shares outstanding. Following the method of Anderson and Dyl (2005), for stocks listed on NASDAQ, daily turnover after 01/01/1997 is calculated as 0.62*share volume/shares outstanding. Ivol is calculated following the method of Bandarchuk and Hilscher (2013), based on the Fama-French 3-factor model. The *t*-statistics are in parentheses and are adjusted using Newey and West (1987) with a lag of five months. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Size (I)	Analyst (II)	NASDAQ (III)	Baseline (IV)	Fully (V)
Firm size	0.174***			0.195***	0.250***
	(57.82)			(34.17)	(34.88)
Analyst coverage		0.441***		0.070***	0.022***
		(65.92)		(10.00)	(3.93)
NASDAQ dummy			-0.244***	0.072***	0.067***
			(-25.09)	(11.51)	(8.08)
Book-to-market					0.074***
					(7.25)
Turnover					-0.004
					(-0.81)
Ivol					8.393***
					(16.85)
Constant	0.281***	0.583***	1.576***	-0.073***	-0.633***
	(12.27)	(22.87)	(86.89)	(-2.66)	(-8.99)
Observations	252	252	252	252	252
Adjusted R^2	0.252	0.159	0.032	0.251	0.281

Table 2. Summary Statistics

The table reports summary statistics of the sample. All the data are monthly data. Panel A shows the descriptive statistics of the main variables. Raw media coverage is the total number of articles about a firm in each month. Raw media tone is calculated as (CSS-50)/50, and CSS (composite sentiment score) is extracted from RavenPack. Residual media coverage/tone is calculated using the formula (2) method. The rating ranges from 1 for AAA bonds to 22 for D bonds. Maturity is the natural logarithm of 1 plus the years to maturity. Issue size is in billion dollars and takes the natural logarithm. Age is the natural logarithm of 1 plus the number of years that have elapsed since the year of the company's IPO. Coupon is the bond annual coupon rate. Panel B displays the summary statistics by raw/residual media coverage. In each month, bonds are sorted into tercile based on cumulative raw/residual media coverage during the past 6 months. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Descriptive statistics

	Mean	Median	Min	Max	Std	P25	P75
Raw Media Coverage	44.51	10.00	1.00	990.00	99.71	4.00	34.00
Raw Media Tone	0.00	0.00	-0.92	1.00	0.05	-0.02	0.02
Residual Media Coverage	0.50	0.28	-2.33	4.62	1.23	-0.38	1.21
Residual Media Tone	-0.03	-0.02	-0.93	0.97	0.06	-0.05	0.00
Monthly Return (%)	0.72	0.39	-14.22	25.93	4.20	-0.49	1.65
Rating	8.10	7.00	1.00	22.00	3.97	5.00	10.00
Maturity	2.57	2.40	0.69	4.62	0.68	2.08	3.43
Issue size	5.90	5.70	-6.91	8.52	1.08	5.30	6.62
Age	1.83	1.90	0.15	3.42	0.81	1.20	2.44
Coupon	6.00	6.63	0.13	18.00	2.09	4.63	7.38
Firm Size	9.89	9.90	1.74	14.35	1.66	8.83	11.11
Analyst	2.80	2.89	1.10	3.93	0.49	2.56	3.14
NASDAQ dummy	0.11	0.00	0.00	1.00	0.31	0.00	0.00

Panel B. Summary statistics by raw/residual media coverage

Media	Firm size	Analyst	NASDAQ	Rating	Maturity	Issue size	Age	Coupon
Tercile sorts based on raw media coverage								
Low	8.67	2.55	0.18	9.46	15.00	5.43	1.83	6.05
Medium	9.72	2.82	0.11	8.15	15.54	5.82	1.84	6.01
High	11.23	3.03	0.05	7.01	16.20	6.45	1.81	5.95
High-Low	2.68***	0.50***	-0.16***	-2.47***	1.56***	1.07***	-0.01***	-0.09***
(t-stat)	(71.08)	(45.71)	(-29.73)	(-26.15)	(10.08)	(67.26)	(-0.68)	(-4.32)
Tercile sorts based on residual media coverage								
Low	9.14	2.67	0.16	8.68	15.86	5.48	1.89	6.13
Medium	9.70	2.78	0.13	8.29	16.25	5.72	1.89	6.07
High	10.90	2.96	0.04	7.36	16.59	6.39	1.83	6.05
High-Low	1.93***	0.32***	-0.14***	-1.39***	0.88***	0.97***	-0.06***	-0.10***
(t-stat)	(46.85)	(28.20)	(-24.78)	(-17.01)	(6.21)	(54.72)	(-5.86)	(-4.36)

Table 3. Residual media coverage and momentum returns

This table presents the effects of residual media coverage on momentum returns. In panel A, both the formation and holding periods are set to 6 months and skip one month in between. Residual media coverage portfolios are formed based on the cumulative residual media coverage during the past 6 months. Bonds without any media coverage during the formation period are excluded. Within each coverage portfolio, bonds are further sorted into 3 portfolios based on average monthly returns during the past 6 months, with winners (losers) ranking above the 70th quintile (below the 30th quintile). Coverage portfolio 1, 2, and 3 represent the lowest, medium, and highest coverage portfolios, respectively. Return spread 3-1 is the return difference between high and low coverage groups. Column Loser and Winner display the average monthly returns for losers and winners during the holding period. Column W-L displays the return difference between winners and losers. Panel B shows the estimated alphas (with Newey-West adjusted t-statistics in parentheses) using GMM with different factor models. The dependent variable is media-based momentum return, or the momentum return difference between high and low coverage groups. Factors included in the models are:

(1) mTERM
(2) mDEF
(3) mDEF, mTERM
(4) MKT,SMB,HML
(5) MKT,SMB,HML,MOM
(6) MKT, SMB, HML, mDEF, mTERM
(7) MKT, SMB, HML, ΔDEF, ΔTERM

where MKT, SMB, HML are FF3 factors of Fama and French (1993); the default spread (DEF) is the difference between the monthly returns of long-term investment-grade bonds and long-term government bonds; the term spread (TERM) is the difference between the monthly return of the long-term government bond and the one-month T-bill rate; $\Delta TERM_t=(TERM_t-TERM_{t-1})$, $\Delta DEFt=(DEF_t-DEF_{t-1})$, $mTERM_t=\Delta TERM_t/(1+TERM_{t-1})$, $mDEF_t=\Delta DEF_t/(1+DEF_{t-1})$, which are calculated following Jostova et al. (2013). In panel C, the holding periods are set to 4, 8, and 12 months respectively. Alpha is the intercept of media-based momentum regressed by factors included in model (7). The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline results (J/K=6/6)

	Loser (L)	Winner (W)	W-L	t-stat
Coverage portfolio 1	0.89	0.79	-0.10	(-1.65)
Coverage portfolio 2	0.86	1.00	0.13*	(1.76)
Coverage portfolio 3	0.72	0.89	0.18**	(2.26)
Return spread 3-1	-0.18***	0.10*	0.28***	
t-stat	(-3.41)	(1.84)	(3.59)	

Panel B. Intercepts of multi-factor models for media-based momentum (J/K=6/6)

Factor models	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Alpha	0.280**	0.294**	0.294**	0.284**	0.277**	0.294**	0.281**
t-stat	(2.30)	(2.36)	(2.36)	(2.26)	(2.20)	(2.29)	(2.25)

Panel C. Different holding period (J=6)

	K=4	K=8	K=12
Coverage portfolio 1	-0.09	-0.10*	-0.10**
	(-1.34)	(-1.88)	(-2.10)
Coverage portfolio 3	0.23***	0.14*	0.09
	(2.79)	(1.96)	(1.46)
Return spread 3-1	0.32***	0.24***	0.20***
	(4.01)	(3.48)	(3.06)
Alpha	0.33**	0.27*	0.23*
	(2.78)	(2.23)	(1.92)

Table 4. Robustness checks

This table shows the robustness checks for media-based momentum. For brevity, only multi-factor model (7) in table 3 is used to calculate Alpha. In panel A, residual media coverage is calculated using methods different from the baseline in formula (2). Different explanatory variables are included in the regression model to get residual media coverage. In panel B, each month, characteristic-adjusted returns are computed by subtracting from individual monthly bond return the average monthly return of the characteristic decile to which the bond belongs. Then portfolios are constructed in the same way as Table 3. The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Different empirical designs of residual media coverage

	Raw coverage	Size	Analyst	Size+Analyst	Baseline+BTM
Coverage portfolio 1	0.02	-0.12*	-0.08	-0.08	-0.07
	(0.21)	(-1.88)	(-1.15)	(-1.29)	(-1.12)
Coverage portfolio 3	0.42***	0.21**	0.21**	0.22***	0.25***
	(5.17)	(2.60)	(2.59)	(2.75)	(4.00)
Return spread 3-1	0.41***	0.34***	0.29***	0.30***	0.32***
	(4.93)	(4.17)	(3.61)	(3.85)	(4.26)
Alpha	0.25	0.29**	0.32**	0.27**	0.20*
	(1.63)	(2.14)	(2.24)	(1.98)	(1.80)

Panel B. Momentum profits based on characteristic-adjusted returns

	Maturity-adjusted	Age-adjusted	Rating-adjusted	Issue size-adjusted
Coverage portfolio 1	-0.04	-0.02	0.00	-0.01
	(-0.67)	(-0.42)	(0.08)	(-0.23)
Coverage portfolio 3	0.23***	0.24***	0.21***	0.23***
	(3.08)	(3.14)	(3.54)	(3.03)
Return spread 3-1	0.27***	0.26***	0.20***	0.24***
	(3.71)	(3.59)	(3.00)	(3.24)
Alpha	0.27***	0.26**	0.21**	0.24*
	(2.23)	(2.13)	(2.04)	(1.95)

Table 5. Residual media coverage and momentum returns by bond rating

This table shows the momentum returns considering bond rating. Both the formation and holding periods are set to 6 months. Panel A displays the summary statistics by rating. Bonds rated above BBB are classified as Investment Grade (IG), while bonds rated below BBB are classified as Non-Investment Grade (NIG). Panel B displays the momentum returns for different rating groups. In each month, IG and NIG bonds are sorted into tercile based on the cumulative residual media coverage during the past 6 months. Momentum returns are calculated following the method of Jegadeesh and Titman (1993). The column Alpha shows the intercept of multi-factor models using return spread 3-1 or media-based momentum return as the dependent variable. For brevity, only model (7) in table 3 is used as the basic multi-factor model for all the following results. The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Summary description by bond rating

	Distribution		Monthly Return			Residual Coverage		
Rating	N	Percent(%)	Mean	Median	Std	Mean	Median	Std
IG	72,682	50.37	0.60	0.40	3.06	2.98	2.77	1.48
NIG	18,767	13.01	1.62	0.81	7.19	2.16	1.95	1.07
Not Rated	52,835	36.62	0.67	0.35	4.18	2.40	2.20	1.21

Panel B. Momentum returns for different rating groups (J/K=6/6)

	IG bonds				NIG bonds			
Media coverage	Loser (L)	Winner (W)	W-L	Alpha	Loser (L)	Winner (W)	W-L	Alpha
Coverage portfolio 1	0.73	0.72	-0.01	-0.01	1.28	1.09	-0.14	-0.13
			(-0.21)	(-0.17)			(-1.02)	(-0.70)
Coverage portfolio 2	0.65	0.68	0.03	0.05	1.12	1.00	-0.11	-0.08
			(0.58)	(0.72)			(-0.42)	(-0.20)
Coverage portfolio 3	0.59	0.60	0.02	-0.01	1.31	1.75	0.57**	0.61*
			(0.40)	(-0.08)			(2.33)	(1.68)
Return spread 3-1	-0.15***	-0.12***	0.03	0.01	-0.04	0.81***	0.73**	0.76*
t-stat	(-2.80)	(-2.71)	(0.50)	(0.07)	(-0.17)	(3.58)	(2.48)	(1.78)

Panel C. Different holding periods (J=6)

	IG bonds			NIG bonds		
Holding months	K=4	K=8	K=12	K=4	K=8	K=12
Coverage portfolio 1	0.02	0.04	0.06	-0.22	-0.03	-0.08
	(0.31)	(0.81)	(1.59)	(-1.27)	(-0.24)	(-0.62)
Coverage portfolio 3	0.03	-0.01	-0.05	0.68**	0.42*	0.38*
	(0.46)	(-0.30)	(-1.24)	(2.28)	(1.86)	(1.92)
Return spread 3-1	0.01	-0.05	-0.12***	0.92***	0.41	0.46**
	(0.15)	(-0.94)	(-2.71)	(2.70)	(1.60)	(1.98)
Alpha	0.01	-0.06	-0.13*	0.93*	0.46	0.48
	(0.07)	(-0.71)	(-1.94)	(1.77)	(1.21)	(1.41)

Table 6. Media coverage and bond momentum: cross-sectional regression

The table reports the OLS regression results. The dependent variable is the forward monthly return of each bond from t+1 to t+6. Independent variable $r_{t-6,t-1}$ is the average monthly return from t-6 to t-1. Dum_high/low is a dummy variable, which indicates 1 if the bond belongs to high/low media coverage portfolio and 0 if not. The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable / Models	I	II	III	IV	V
$r_{t-6,t-1}$	4.087***	3.451***	2.520***	3.463***	2.723***
	(11.49)	(6.54)	(3.70)	(5.21)	(4.09)
dum_high$\times r_{t-6,t-1}$		5.832***	2.864***	6.991***	7.331***
		(7.24)	(3.11)	(7.20)	(7.45)
dum_low$\times r_{t-6,t-1}$		-3.632***	-2.602**	-2.589***	-1.905*
		(-4.51)	(-2.49)	(-2.63)	(-1.92)
Age			0.150***	0.038*	-0.005
			(7.44)	(1.82)	(-0.22)
Rating			0.069***	0.007**	0.010**
			(27.91)	(2.15)	(2.52)
Residual media tone			1.096***	1.099***	1.077***
			(6.85)	(7.30)	(7.13)
Maturity			0.006***	0.010***	0.009***
			(8.66)	(13.71)	(11.28)
Book to market				0.304***	0.371***
				(24.04)	(26.53)
Firm size				-0.125***	-0.121***
				(-13.63)	(-12.20)
Analyst				-0.036	-0.053**
				(-1.57)	(-2.02)
Adj. R^2	0.002	0.003	0.027	0.046	0.055
Fama-French 48 industry dummies	no	no	no	no	yes
Month fixed effect	yes	yes	yes	yes	yes

Table 7. Medium-run momentum and long-term reversal

This table displays the momentum returns for the full sample, NIG bonds, and IG bonds over different holding periods. In each month t, the momentum strategies are constructed similarly to Table 3. The portfolios are held from month t+1 to t+12 (panel A), and from t+13 to t+24 (panel B). The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Momentum effect in t+1 to t+12 (J=6)

	Full sample			NIG bonds			IG bonds		
Media coverage	Loser (L)	Winner (W)	W-L	Loser (L)	Winner (W)	W-L	Loser (L)	Winner (W)	W-L
Coverage portfolio 1	0.90	0.79	-0.10**	1.21	1.07	-0.08	0.70	0.76	0.06
			(-2.10)			(-0.62)			(1.59)
Coverage portfolio 3	0.80	0.90	0.09	1.55	1.88	0.38*	0.62	0.57	-0.05
			(1.46)			(1.92)			(-1.24)
Return spread 3-1	-0.09**	0.10**	0.17***	0.31*	0.90***	0.46**	-0.08**	-0.19***	-0.12***
t-stat	(-2.28)	(2.23)	(4.34)	(1.69)	(4.67)	(1.98)	(-2.09)	(-5.88)	(-2.71)

Panel B. Momentum effect in t+13 to t+24 (J=6)

	Full sample			NIG bonds			IG bonds		
Media coverage	Loser (L)	Winner (W)	W-L	Loser (L)	Winner (W)	W-L	Loser (L)	Winner (W)	W-L
Coverage portfolio 1	1.10	1.03	-0.07	1.14	1.10	-0.04	0.90	0.86	-0.04
			(-1.11)			(-0.29)			(-0.59)
Coverage portfolio 3	1.39	0.91	-0.48***	2.75	2.01	-0.73***	1.13	0.63	-0.50***
			(-5.74)			(-2.92)			(-7.01)
Return spread 3-1	0.29***	-0.12**	-0.41***	1.57***	0.92***	-0.67**	0.23***	-0.24***	-0.46***
t-stat	(4.46)	(-2.33)	(-4.91)	(5.52)	(5.21)	(-2.16)	(3.69)	(-5.36)	(-6.35)

Table 8. Tone-enhanced momentum returns

This table presents the results of tone-enhanced momentum returns. Media tone is calculated by (CSS-50)/50, which ranges from -1 to 1. Media tone>0 means the news has positive tone; media tone<0 means the news has negative tone; media tone=0 means the news is neutral. PWNL is the return of winners with a positive tone minus the return of losers with a negative tone. NWPL is the return of winners with a negative tone minus the return of losers with a positive tone. The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Tone-enhanced momentum returns (J/K=6/6)

	PWNL				NWPL			
Media coverage	Loser (L)	Winner (W)	W-L	Alpha	Loser (L)	Winner (W)	W-L	Alpha
Coverage portfolio 1	0.89	0.96	-0.00	-0.03	0.96	0.87	-0.03	-0.06
			(-0.04)	(-0.18)			(-0.25)	(-0.37)
Coverage portfolio 2	0.89	1.07	0.12	0.15	1.07	1.06	0.12	0.11
			(0.86)	(0.74)			(0.86)	(0.61)
Coverage portfolio 3	0.76	1.26	0.40**	0.48**	0.88	0.83	0.04	-0.00
			(2.45)	(2.25)			(0.28)	(-0.02)
Return spread 3-1	-0.13**	0.33*	0.41**	0.52*	-0.06	-0.04	0.02	0.02
t-stat	(-2.24)	(1.74)	(2.06)	(1.92)	(-0.46)	(-0.69)	(0.12)	(0.10)

Panel B. Holding in the short- and mid-term run: from t+1 to t+K (J=6)

	PWNL			NWPL		
Holding months	K=4	K=8	K=12	K=4	K=8	K=12
Coverage portfolio 1	0.01	0.02	0.08	-0.04	0.07	0.08
	(0.07)	(0.18)	(0.79)	(-0.26)	(0.62)	(0.74)
Coverage portfolio 3	0.44***	0.32**	0.36***	0.23	0.07	0.04
	(2.89)	(2.51)	(3.20)	(1.62)	(0.51)	(0.31)
Return spread 3-1	0.48***	0.30*	0.33**	0.27	0.00	-0.04
	(2.64)	(1.94)	(2.23)	(1.44)	(0.03)	(-0.22)
Alpha	0.57**	0.37	0.40*	0.26	-0.01	-0.05
	(2.29)	(1.54)	(1.74)	(1.28)	(-0.05)	(-0.24)

Panel C. Holding in the long term: from t+13 to t+K (J=6)

	PWNL			NWPL		
Holding months	K=16	K=20	K=24	K=16	K=20	K=24
Coverage portfolio 1	0.17	0.22	0.20	0.30**	0.26**	0.19*
	(0.85)	(1.17)	(1.07)	(2.61)	(2.41)	(1.80)
Coverage portfolio 3	-0.24*	-0.42***	-0.51***	0.19	0.16	0.13
	(-1.96)	(-3.93)	(-5.11)	(1.09)	(1.06)	(0.83)
Return spread 3-1	-0.41*	-0.64***	-0.71***	-0.11	-0.09	-0.06
	(-1.74)	(-2.97)	(-3.39)	(-0.52)	(-0.49)	(-0.29)
Alpha	-0.36	-0.61*	-0.75**	-0.22	-0.08	-0.07
	(-1.11)	(-1.89)	(-2.57)	(-0.81)	(-0.32)	(-0.30)

Table 9. Informed trading and momentum

This table shows the momentum returns considering the factor of informed trading. In month *t*, and for each issuer *i*, the three bonds with the highest total volumes of institutional trades (if any) are identified as the firm i's top-three bonds in month t. Henceforth, the top-three bonds are called, for brevity, the top bonds. The remaining bonds issued by firm *i* in month t are the non-top bonds of firm i. Note that firms are not required to have three top bonds, or any top bond, in order to have a non-top bond. Institutional trades are trades with a par value >= $500,000. To form a top bond momentum strategy in the formation month t, we identify bonds that have been continuously top bonds over the formation period. Then the top bonds are sorted into tercile based on cumulative residual media coverage during the formation period. Within each coverage group, bonds are further sorted into losers, medium, and winners based on past monthly returns. The momentum portfolio for non-top bonds is constructed analogously. Panel A shows the momentum returns when J/K=6/6. In panel B, tested holding periods are from month t+1 to t+K, and K is set to 4, 8, and 12, respectively. In panel C, tested holding periods are from month t+13 to t+K, and K is set to 16, 20, and 24, respectively. The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Informed trading and momentum (J/K=6/6)

	Non-top				Top			
Media coverage	Loser (L)	Winner (W)	W-L	Alpha	Loser (L)	Winner (W)	W-L	Alpha
Coverage portfolio 1	0.72	0.75	0.04	0.02	0.85	0.78	-0.07	-0.06
			(0.64)	(0.17)			(-0.96)	(-0.57)
Coverage portfolio 2	0.74	0.81	0.08	0.03	0.89	0.93	0.03	0.01
			(1.03)	(0.20)			(0.37)	(0.07)
Coverage portfolio 3	0.62	0.72	0.09	0.08	0.83	1.30	0.47***	0.44**
			(1.06)	(0.51)			(4.14)	(2.09)
Return spread 3-1	-0.09	-0.04	0.05	0.06	-0.02	0.52***	0.54***	0.50**
t-stat	(-1.30)	(-0.93)	(0.64)	(0.50)	(-0.27)	(5.31)	(4.42)	(2.29)

Panel B. Holding in the short- and mid-term run: from t+1 to t+K (J=6)

	Non-Top			Top		
Holding months	K=4	K=8	K=12	K=4	K=8	K=12
Coverage portfolio 1	0.05	0.07	0.07	-0.09	-0.09	-0.03
	(0.88)	(1.04)	(1.33)	(-1.07)	(-1.40)	(-0.58)
Coverage portfolio 3	0.15	0.03	-0.03	0.55***	0.44***	0.43***
	(1.62)	(0.32)	(-0.43)	(4.30)	(3.80)	(4.24)
Return spread 3-1	0.10	-0.04	-0.10	0.64***	0.53***	0.47***
	(1.08)	(-0.48)	(-1.37)	(4.89)	(4.28)	(4.12)
Alpha	0.12	-0.05	-0.12	0.62***	0.50**	0.43**
	(0.95)	(-0.40)	(-1.02)	(2.90)	(2.26)	(2.13)

Panel C. Holding in the long term: from t+13 to t+K (J=6)

	Non-Top			Top		
Holding months	K=16	K=20	K=24	K=16	K=20	K=24
Coverage portfolio 1	-0.05	0.01	-0.01	-0.02	-0.02	-0.06
	(-1.00)	(0.20)	(-0.20)	(-0.37)	(-0.35)	(-1.09)
Coverage portfolio 3	-0.26***	-0.09	-0.01	-0.29***	-0.21**	-0.11
	(-3.28)	(-1.31)	(-0.22)	(-2.81)	(-2.05)	(-1.06)
Return spread 3-1	-0.21**	-0.10	-0.01	-0.27**	-0.19	-0.05
	(-2.55)	(-1.39)	(-0.07)	(-2.28)	(-1.59)	(-0.43)
Alpha	-0.25*	-0.19	-0.08	-0.40***	-0.30*	-0.19
	(-1.70)	(-1.47)	(-0.66)	(-2.66)	(-1.86)	(-1.17)

Table 10. Subsample analysis: up and down markets

This table shows the media-based momentum under different market states. Following the method of Li and Galvani (2018), we define month t as being in the Up (Down) market state if the average monthly return of the equally weighted market portfolio in our sample over t-12 to t-1 is above or equal (below) the return constructed in the same way over January 2000 to t-1. In panel A, both the formation and holding periods are set to 6 months. In panel B, the holding period is set to 4, 8, 12 months respectively. The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Market state and momentum returns (J/K=6/6)

	Up				Down			
Media coverage	Loser (L)	Winner (W)	W-L	Alpha	Loser (L)	Winner (W)	W-L	Alpha
Coverage portfolio 1	0.83	0.70	0.08	0.05	0.89	0.97	-0.13*	-0.13
			(0.73)	(0.35)			(-1.72)	(-1.05)
Coverage portfolio 3	0.74	0.77	0.55***	0.49**	0.62	1.17	0.02	0.03
			(4.02)	(2.14)			(0.23)	(0.17)
Return spread 3-1	-0.27***	0.20	0.46***	0.46*	-0.08	0.07	0.16*	0.16
t-stat	(-3.64)	(1.63)	(3.11)	(1.67)	(-1.28)	(1.15)	(1.68)	(1.17)

Panel B. Different holding periods (J=6)

	Up			Down		
Holding months	K=4	K=8	K=12	K=4	K=8	K=12
Coverage portfolio 1	0.06	0.15	0.20**	-0.13	-0.16**	-0.21***
	(0.55)	(1.47)	(2.37)	(-1.49)	(-2.37)	(-3.38)
Coverage portfolio 3	0.62***	0.51***	0.53***	0.07	-0.01	-0.09
	(4.18)	(3.92)	(4.73)	(0.67)	(-0.17)	(-1.14)
Return spread 3-1	0.56***	0.36**	0.33***	0.20**	0.14*	0.12
	(3.95)	(2.58)	(2.68)	(2.06)	(1.79)	(1.57)
Alpha	0.50**	0.37	0.33	0.22	0.14	0.11
	(2.18)	(1.52)	(1.50)	(1.59)	(1.12)	(0.88)

Table 11. Firm-level analysis

This table presents the effects of residual media coverage on momentum returns at the firm level. Each month and for each issuer, we only keep one bond with the largest issuing size. If multiple bonds have the same issuing size, we keep the most newly issued one. The momentum strategies are constructed in the same way as the baseline. The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline results (J/K=6/6)

Media coverage	Loser (L)	Winner (W)	W-L	alpha
Coverage portfolio 1	0.88	0.80	-0.08	-0.09
			(-0.98)	(-0.80)
Coverage portfolio 3	0.88	1.19	0.31***	0.31*
			(3.16)	(1.83)
Return spread 3-1	-0.00	0.39***	0.39***	0.40**
t-stat	(-0.04)	(4.99)	(3.28)	(2.12)

Panel B. Residual media coverage and momentum returns: different holding period

Holding months	K=4	K=8	K=12
Coverage portfolio 1	-0.13	-0.06	-0.09
	(-1.42)	(-0.79)	(-1.37)
Coverage portfolio 3	0.26**	0.29***	0.21**
	(2.31)	(3.16)	(2.44)
Return spread 3-1	0.39***	0.35***	0.29***
	(2.95)	(3.18)	(2.94)
Alpha	0.40**	0.30*	0.28
	(2.19)	(1.65)	(1.54)

Table 12. Buy-side competition and bond momentum

This table shows the media and momentum returns considering the factor of buy-side competition. We construct the measure of buy-side competition of bond level following the method of Hoberg, Kumar, and Prabhala (2022). In each month, we first sort bonds into tercile based on their buy-side competition. Bonds in the highest (lowest) tercile are classified as high (low) competition portfolios. Then within each competition portfolio, bonds are further double sorted based on past residual media coverage and returns in the same way with the baseline. In panel A, both the formation and holding period are set to 6 months. In panel B, the holding period is set to 4, 8 and 12 months respectively. The *t*-statistics are in parentheses. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Buy-side competition and momentum returns (J/K=6/6)

	Low competition				High competition			
Media coverage	Loser (L)	Winner (W)	W-L	Alpha	Loser (L)	Winner (W)	W-L	Alpha
Coverage portfolio 1	0.94	0.86	-0.08	-0.10	0.58	0.52	-0.06	-0.00
			(-0.77)	(-0.69)			(-1.19)	(-0.07)
Coverage portfolio 3	0.88	1.25	0.37***	0.35*	0.50	0.49	-0.01	0.01
			(2.96)	(1.70)			(-0.15)	(0.12)
Return spread 3-1	-0.06	0.39***	0.45***	0.43**	-0.08**	-0.03	0.05	0.04
t-stat	(-0.56)	(3.85)	(3.01)	-2.06	(-2.22)	(-0.92)	(1.04)	-0.69

Panel B. Different holding period (J=6)

	Low competition			High competition		
Holding months	K=4	K=8	K=12	K=4	K=8	K=12
Coverage portfolio 1	-0.18	-0.05	-0.00	-0.01	-0.04	0.06
	(-1.60)	(-0.57)	(-0.05)	(-0.23)	(-0.75)	(1.34)
Coverage portfolio 3	0.52***	0.34***	0.31***	-0.02	-0.03	-0.04
	(3.66)	(2.82)	(2.97)	(-0.45)	(-0.77)	(-1.29)
Return spread 3-1	0.70***	0.39***	0.32**	-0.01	0.01	-0.11**
	(3.99)	(3.07)	(2.57)	(-0.17)	(0.20)	(-2.32)
Alpha	0.68***	0.38*	0.25	-0.02	-0.03	-0.13*
	(2.78)	(1.88)	(1.24)	(-0.28)	(-0.54)	(-1.87)

Table 13. Different media types and momentum

This table displays the media effect on bond momentum under different media types. According to the user guide of RavenPack, News flash refers to a news article composed of a headline and no body text. A press release refers to a corporate announcement originated by an entity and distributed via a news provider. In panel A, we focus on the sum of media coverage of individual bonds during the formation period, which is set to 6 months. Raw coverage is log(1+no. articles). Residual coverage is calculated based on formula (2). In panel B, media coverage is calculated using only News flash and Press releases, respectively. The momentum strategy is constructed in the same way as the baseline. The signs *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Summary statistics of raw and residual media coverage (J=6)

	Mean	Median	Min	Max	Std	Sum
			Raw coverage			
News flash	14.23	13.37	0.69	35.60	7.10	1,497,199.70
Press release	11.25	9.78	0.69	33.18	6.45	1,175,109.60
			Residual coverage			
News flash	4.49	3.41	-6.78	26.01	5.40	401,917.19
Press release	4.70	3.10	-4.19	24.28	5.16	417,728.35

Panel B. Momentum effect under different media types (J=6)

	News flash				Press release			
Holding months	K=4	K=6	K=12	K=24	K=4	K=6	K=12	K=24
Coverage portfolio 1	-0.05	-0.09	-0.05	-0.03	0.01	0.02	0.03	-0.03
	(-0.76)	(-1.42)	(-0.96)	(-0.75)	(0.16)	(0.24)	(0.65)	(-0.79)
Coverage portfolio 3	0.20^{**}	0.16^{**}	0.11	-0.11^{**}	0.17^{**}	0.13^{*}	0.04	-0.10^{**}
	(2.38)	(1.98)	(1.62)	(-2.35)	(2.06)	(1.67)	(0.74)	(-2.02)
Return spread 3-1	0.26^{***}	0.25^{***}	0.15^{**}	-0.09^{*}	0.16^{*}	0.11	0.01	-0.07
	(3.11)	(3.17)	(2.34)	(-1.84)	(1.82)	(1.35)	(0.14)	(-1.48)