# The Market's Reaction to Changes in Performance Rankings within Industry

Jared Jennings
Olin School of Business
Washington University
jaredjennings@wustl.edu

Hojun Seo
Olin School of Business
Washington University
hojun.seo@wustl.edu

Mark T. Soliman*
Marshall School of Business
University of Southern California
msoliman@usc.edu

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Abstract:

We examine how investors value changes in the relative ranking of the firm within its industry based on performance (measured as ROE, ROA and Profit Margin). We find that short window equity returns are significantly related to changes in the firm's performance ranking within the industry, especially when the firm's ranking has been stable in the recent past. We also provide evidence that managers manipulate earnings to improve their performance ranking. Our results suggest that the firm's industry ranking constitutes an additional and relevant benchmark for investors and managers that has not been explored by prior research. Our final analysis also suggests that investors focus on a firm's industry ranking is warranted due to the information gleaned about firm's competitive advantage and sustainability of future earnings. It appears that investors use the entire distribution of earnings to evaluate a firm's performance and not just analyst expectations or the prior period's performance.

Keywords: performance ranking, earnings, benchmarking

JEL classification: M40; M41

## 1. Introduction

A lucid benchmark that investors use to assess the firm's performance is analyst expectations (Graham, Harvey, and Rajgopal, 2005; Bhojraj, Hribar, Picconi, and McInnis, 2009). The financial press commonly compares the firm's announced earnings to what analysts and other market participants expect. Not surprisingly, the prior literature has primarily focused on the benefits that a firm experiences when meeting or beating analyst expectations. For example, Kasznik and McNichols (2002) and Fischer, Jennings, and Soliman (2014) provide both empirical and theoretical evidence that firms meeting or beating analyst expectations have higher returns and stock prices than firms that do not. However, the firm's performance relative to analyst expectations is certainly not the only benchmark that investors use to assess the firm's performance over the prior quarter and possible implications for the future. Market participants, such as the media, often compare the performance of the firm with that of other firms in the same industry and either implicitly or explicitly *rank* how firms compare to competitors. For example, The New York Times (2015) recently compared the operating incomes of Apple and Microsoft, implicitly ranking each firm's performance and the Wall Street Journal (2012) noted that Lenovo increased personal computer shipments from 2010 to 2012, improving its ranking from 4$^{th}$ to 2$^{nd}$ in the industry. This type of analysis is common. The Wall Street Journal (2014) compared the operating profit margins for several firms in the automotive industry when evaluating the operating performance of Chrysler. Similar examples dot the financial press landscape. Despite this common approach in the popular press, the academic literature has done little to explore the notion of whether investors rank firms in the same industry. We examine whether 1) there is any new information conveyed in industry rankings, 2) investors price this information and 3) managers respond by attempting to improve their manipulate their industry ranking.

In this paper, we examine whether relevant information is communicated through a change in the firm's ranking (based on performance measures such as return on assets, return on equity, and profit margin) within the industry. By doing so, we hope to explore and better understand the capital market implications when the firm's performance ranking changes as well as the types of benchmarks investors

use to evaluate the firm's performance. Despite the fact that the financial press and financial statement users have compared the firm's performance relative to other firms in the industry, empirical academic evidence examining how changes to the firm's performance ranking within the industry informs capital markets is minimal.[1] We also examine whether managers opportunistically manage earnings to affect the firm's performance ranking and whether market participants anticipate the manipulation of earnings when it is more likely to be opportunistic.

A firm's performance can be decomposed into a firm-specific and non-firm-specific component (e.g., Waring, 1996; Rumelt 1991; McGahan and Porter 2002). The non-firm-specific component of the firm's performance is influenced by industry or market level shocks that affect all firms and may be useful in evaluating the overall health of the industry or market. However, the component of performance that is largely informative to the firm's individual performance is the firm-specific component, which is determined by the firm's competitive advantage within the industry and is the source for intra-industry heterogeneity (e.g., Rumelt, 1991; Nelson, 1991; McGahan and Porter, 2002). Hence, investors are more likely to focus on a change in the firm-specific component of performance when evaluating the firm's individual performance within the industry.[2] If the competitive advantage of the firm is not readily substituted or imitated by rivals, then the change in the firm's competitive advantage is expected to reflect an increase in expected future shareholder profits generated by the firm (e.g., Peteraf, 1993).

We argue that the firm's performance ranking within industry is an important information source that allows investors to understand the firm-specific component of the firm's performance and changes in this ranking may give insight into competitive advantage. We remove the industry-specific and market-specific information related to the firm's performance by calculating the performance rankings within

[1] A similar notion exists in the contracting literature, where Relative Performance Evaluation (RPE) theory has been extensively studied. Since Holmstrom (1982), much of the empirical RPE literature examines weather the compensation committee uses the performance of peer firms to filter out the effect of common external shocks from the firm's performance to evaluate CEOs (Aggarwal and Samwick, 1999; Gibbons and Murphy, 1990). According to the RPE theory, the CEO's exposure to uncontrollable risks can be eliminated by filtering out the effect of common external shocks when determining the CEO's compensation, leading to increased contracting efficiency (Holmstrom, 1982).

[2] These concepts are found in other areas of the literature and are not new. For example, the CAPM argues that only firm-specific risk should be priced and all sources of risk can be diversified away and the compensation literature argues that only firm-specific performance, controllable by the manager, should be compensated.

industry. Thus, examining changes to the relative performance of the firm within an industry allows investors to infer whether or not the firm's management has been successful at generating a competitive advantage within the industry, providing additional insights into the overall performance of the firm that are not identified by simply examining whether the firm beats an external benchmark (e.g., analyst forecasts or prior earnings).

Using a sample of 203,056 firm/quarter observations from 1997 to 2013, we attempt to measure whether and how investors value a change in the firm-specific component of performance by examining changes in the firm's performance ranking within its industry. To calculate changes in the firm's performance ranking, we compare an initial ranking of the firm's performance, based on expected earnings, to the realized ranking of the firm's performance, based on realized earnings.[3] Consistent with expectations, we find that the change in the firm's performance ranking is positively associated with buy-and-hold abnormal short window returns during the three-day period surrounding the earnings announcement, after controlling for the firm's earnings surprise and other firm characteristics. In fact, surprisingly, the positive market reaction to an increase in the firm's performance ranking within the industry is approximately 87% of the market's reaction to a similar change in the firm's earnings surprise. This strong evidence suggests that investors use the relative performance of the firm within the industry to assess the firm's ability to generate profits for shareholders.

Next, we examine whether the stability of the firm's past performance ranking influences the investors' reaction to a change in the performance ranking of the firm in the current period. If the firm-specific component of performance has been stable (volatile) in the recent past, a change in the firm's

[3] The change in the firm's performance ranking is specifically defined as the change in the firm's performance ranking based on IBES-reported Actual EPS at the earnings announcement compared to the firm's performance ranking based on expected earnings two days prior to the earnings announcement. To measure the firm's performance ranking relative to industry peers, we use either peer firms' expected or announced earnings, depending on whether peer firms have already announced earnings. We discuss the construction of this variable more in depth in Section 3. While we could examine the change in the firm's performance ranking at various points during the fiscal period, we choose the earnings announcement date for two reasons. First, the earnings announcement is a significant firm event that reveals information about the firm, prompting investors to evaluate the firm's performance, increasing the power of our tests. Second, management announces earnings during the earnings announcement, allowing us to evaluate the market's response to the change in the firm's performance ranking relative to the market's response to the earnings surprise. This allows us to evaluate the incremental informativeness of the change in the firm's performance ranking conveyed by the release of earnings.

performance ranking in the current period is more (less) likely to provide an informative signal about the change in the expected performance or competitiveness of the firm within the industry. Consistent with our prediction, we find that investors' reaction to a change in the performance ranking of the firm is greatest (lowest) when the firm's past performance ranking has been stable (volatile) over the preceding 16 quarters. We estimate that the market reaction to a change in the firm's performance ranking is approximately 130% (45%) of the market's reaction to the firm's earnings surprise when the volatility of firm's past performance ranking within the industry is in its lowest (highest) percentile.

In 1998, Arthur Levitt, former SEC commissioner, expressed concern that firms were using earnings management to meet or beat analyst expectations.[4] Since then, several papers have examined how managers might influence analyst expectations or manipulate earnings to opportunistically exceed analyst expectations. The prior literature has provided evidence consistent with managers using accrual manipulation (e.g., Abarbanell and Lehavy, 2003; Burgstahler and Eames, 2006), expectations management (e.g., Matusmoto, 2002), real activities manipulation (e.g., Roychowdhury, 2006), and non-GAAP earnings manipulation (e.g., Doyle, Jennings, and Soliman, 2013) to opportunistically exceed analyst expectations. Therefore, if the firm's performance ranking within the industry is an important benchmark used by investors to evaluate the firm's performance, we anticipate that managers also have the incentive to opportunistically manipulate their performance ranking.

Since changes in the firm's performance ranking can change each time a firm in the industry announces earnings (which may occur frequently during the quarter), managers are likely unable to utilize many of the previously documented earnings management tools due to potentially sudden changes in the firm's performance ranking as other firms in the industry announce earnings. Accordingly, we focus on the opportunistic exclusion of expenses from non-GAAP earnings (e.g., Bradshaw and Sloan, 2002; Doyle et al., 2003; Bowen et al., 2005; Doyle et al., 2013) to examine whether managers opportunistically manipulate the firm's performance ranking. The opportunistic exclusion of expenses from non-GAAP earnings does not require journal entries, a change in the operations of the firm, or extensive justification

[4] http://www.sec.gov/news/speech/speecharchive/1998/spch220.txt

for excluding expenses with the auditor. Consistent with our expectation, we find evidence consistent with managers excluding expenses from non-GAAP earnings to improve the firm's performance ranking within the industry. Further, our results appear to be primarily driven by the excluded expenses that prior literature has found to be more opportunistic in nature (i.e., other exclusions), as documented in Doyle et al. (2013).[5] However, similar to investors partially unwinding the opportunistic use of exclusions to meet or beat expectations (Doyle et al., 2013), investors appear to partially unwind manager's attempts to improve their ranking further confirming the importance of this benchmark, We find evidence that investors' positive reaction to the improvement in the firm's performance ranking is significantly reduced, but still positive, when the exclusions are more likely to be opportunistic.

In each of our tests described above, we control for firm size, book-to-market ratio, sales growth, the magnitude of the earnings surprise, revenue surprise, changes in industry-adjusted return on assets, accruals, industry competition, the firm's initial ranking within the industry, and the volatility of the firm's performance ranking changes within the industry over the past 16 quarters. We also cluster the standard errors by firm and quarter to correct for potential serial and cross-sectional correlation (Peterson, 2009).

Finally, we explore *why* investors are pricing this ranking (and why managers are trying to artificially achieve it). We investigate whether the firm's relative performance ranking within the industry measures some form of competitive advantage and look at whether earnings persistence is positively associated with changes to the firm's industry ranking. Earnings innovations are more likely to persist if the firm has a competitive advantage within the industry. If a change in the firm's performance ranking

[5] We note that the initial ranking (analysts' median forecasts) and the realized ranking (announced earnings) are both forecasted on the same basis, which is typically called "core" or "street" earnings. Therefore, the exclusions of expenses are not necessarily going to mechanically increase the firm's performance ranking in the industry because analysts forecast "core" earnings and not exclusions (Doyle et al., 2013). Similar to Doyle et al. (2013), we also perform two tests to alleviate the concern that we are not simply documenting a mechanical correlation between the changes in the firm's performance ranking and using exclusions. First, we find no evidence that income-decreasing exclusions decrease the firm's performance ranking, which would arise if exclusions were mechanically related to the change in the firm's performance ranking. Second, we decompose total exclusions into special items (i.e., expected exclusions) and other exclusions (i.e., unexpected exclusions) and find that the use of income-increasing special items appears to be positively associated with the change in the firm's performance ranking but not to the extent that income-increasing other exclusions affect the change in the firm's performance ranking.

within the industry captures changes to the firm's competitive advantage, then we predict earnings to be more persistent in future periods. Consistent with our expectations, we find that earnings are more persistent when the firm's performance ranking increases, after controlling for known determinants of future earnings. These results provide additional evidence that the change in the relative ranking of the firm reflects changes to the competitive advantage of the firm.

This paper contributes to the literature in two key ways. First, we document another important and significant benchmark that investors use to evaluate the firms' performance – the relative ranking of the firm's performance within the industry. Put differently, our study suggests that investors evaluate the firm's performance based on the entire distribution of earnings in a given industry to shed additional light on the firm's competitive position within the industry. The prior literature, however, has primarily focused on the costs and benefits of meeting or beating analyst expectations (e.g., Degeorge et al., 1999; Matsumoto, 2002; Skinner and Sloan, 2002; Fischer et al., 2014), increasing earnings or revenues from the prior period (e.g., Burgstahler and Dichev, 1997; Degeorge et al., 1999; Ertimur, Livnat, and Martikainen, 2003; Jegadeesh and Livnat, 2006), or reporting earnings greater than zero (e.g., Burgstahler and Dichev, 1997). We extend the prior literature by showing that a potentially equally important benchmark that investors use to evaluate firm's performance has been neglected by the literature. Our evidence suggests that earnings convey useful information to investors about unexpected earnings innovations as well as changes in the firm's competitive position within the industry.

Second, we find that the opportunistic use of positive exclusions is not limited to meeting or beating analyst expectations but is also associated with manipulating the firm's relative ranking within the industry. The vast majority of the extant literature seems to focus on management manipulating earnings to meet or beat the analysts' consensus forecast (Doyle et al., 2013), to increase earnings from the prior period (Burgstahler and Dichev, 1997; Degeorge et al., 1999), or to avoid negative earnings (Burgstahler and Dichev, 1997). The prior literature pays little attention to the earnings management incentives for firms that are well above or below these specific benchmarks. We provide evidence that managers have

incentives to manipulate earnings even though they may be comfortably below or above these specific benchmarks documented in the extant literature.

In the next section, we develop our hypotheses. In Section 3, we describe our empirical tests. We discuss our results in Section 4 and Section 5. We discuss the results from additional robustness tests in Section 6. We conclude our study in Section 7.

## 2. Hypothesis Development

Analyst expectations are a widely used benchmark used to assess the performance of the firm. The financial media routinely cites analyst expectations when reporting the firm's performance as a relevant benchmark in comparing expected performance to actual performance. When the actual performance of the firm is higher than expectations, firms typically experience positive abnormal returns. Kasznik and McNichols (2002) provide empirical evidence that firms that meet or beat analyst expectations experience a positive return premium on their stock. Fischer et al. (2014) provide theoretical and empirical evidence that a rational pricing bubble forms as the number of consecutive quarters that meet or beat analyst expectations increases. Therefore, meeting or beating expectations appears to positively affect the stock price of the firm, increasing management's incentives to meet or beat analyst expectations. Consistent with these findings, in a survey of firm executives, Graham, Harvey, and Rajgopal (2005) find that 74% of firm executives believe that the analysts' consensus forecast is an important benchmark when reporting earnings.

However, meeting or beating analyst expectations is likely not the only benchmark that market participants use to assess the performance of the firm. Analysts and journalists commonly evaluate the performance of the firm relative to other firms that are in the same industry (e.g., Boni and Womack, 2006; Kadan et al., 2012; Calia, 2014; Roger, 2013; Orlick, 2012). Analysts tend to incorporate firm rankings into recommendations; however, other firm, industry, and market factors also heavily influence these recommendations. The financial press also compares the performance of a firm to the performance of other firms in the industry. There is also new evidence that investors co-search for the SEC filings of

firms that have similar fundamentals (Lee, Ma, and Wang, 2014), suggesting that investors evaluate firms relative to other firms in the marketplace. Despite the above, there has been little empirical evidence on how investors react to changes in the relative performance ranking of the firm. To the best of our knowledge, Graham et al. (2005) do not ask corporate executives as to whether the firm's performance ranking within the industry is an important benchmark to firm executives. The absence of this question could be due to the focus of the extant accounting and finance literature on meeting or beating analyst expectations, avoiding losses, and reporting positive increases in earnings. Therefore, we do not currently have much evidence on the relative importance of the firm's performance ranking within the industry.

Rumelt (1991) decomposes overall firm performance into three components: 1) the overall business cycle component, 2) the industry component, and 3) the business-specific component. Rumelt (1991) documents that the business-specific, or firm-specific, component of performance is the most significant driver of the firm's overall performance. Rumelt argues that the firm-specific component of performance is mainly determined by "the presence of business-specific skills, resources, reputations, learning, patents, and other intangible contributions to stable differences among business-unit returns." McGahan and Porter (2002) analyze the variance of accounting profitability and also find consistent evidence that the firm-specific component of performance has the largest influence on overall firm performance. Waring (1996) finds that the persistence of the firm-specific component of performance substantially varies across different industries and documents that variables such as the percentage of professional workers, the degree of unionization, the percentage of consumer purchases, the number of firms within the industry, economies of scale, and R&D intensity have strong influences on the persistence of the firm-specific component of performance. Overall, prior research suggests that the firm-specific component of performance is a significant predictor of the firm's overall profitability.

Based on the above discussion, we anticipate that investors primarily evaluate the overall performance of the firm based on the firm-specific component of performance, which allows investors to better understand the competitive advantages held by the firm in the industry and market. If rivals cannot easily imitate the competitive advantages held by the firm, then these competitive advantages are

expected to be sustained, allowing the firm to generate greater returns for shareholders (e.g., Peteraf, 1993; Barney 1986; Barney 1991). Therefore, a change in the firm-specific component of performance, which is likely associated with the firm's competitive position within the industry, ultimately conveys information to investors about the firm's ability to continue as a going concern and the firm's ability to generate profits for its shareholders.

We argue that investors obtain information regarding changes to the firm-specific component of performance, which likely indicates the competitive position of the firm within the industry, by observing *changes to the firm's performance ranking* within the industry. Of course, managers are always pursuing various strategic activities to establish competitive advantages in order to differentiate themselves from their rivals. However, the effectiveness of those activities may not be directly observable and may not be properly evaluated by investors when immediately implemented. Litov et al. (2012) argue that market participants face significant information problems resulting from managerial proprietary insights about the future value of the firm's unique strategy. They also argue that "if managers do not possess proprietary insights, and instead all opportunities are transparently obvious to the market, replication of strategies will occur and arbitrageurs will buy the resources required by the managers and sell them to the firms at prices near their value added in the manager's strategy, thereby dissipating any value to be created by the strategy (Barney, 1986)." In addition, significant uncertainty exists as to whether the particular strategy can establish competitive advantages that generate sustainable future profits. Therefore, market participants are less likely to fully understand the implications of various strategic activities until earnings are released. The firm's earnings function as a summary statistic for the strategic activities implemented by the manager, allowing investors to evaluate the firm relative to other firms in the industry.[6] Therefore, we anticipate that the firm's earnings provide information about the competitive advantages held by the firm in the industry, which are revealed through realized earnings.

[6] The competitive advantages that generate higher firm performance may not be sustainable in the future if the strategy can be easily replicated by rivals. We discuss this issue in detail in Hypothesis 2.

We argue that one of important ways to infer the firm-specific component of performance is to observe the firm's performance ranking within the industry, which removes industry-specific and market-specific information and focuses on intra-industry firm performance. We specifically predict that investors positively (negatively) value an increase (decrease) in the performance ranking of the firm within the industry. We state our hypothesis in alternative form below.

*H1 – Investors positively (negatively) value an increase (decrease) in the firm's relative performance ranking within the industry.*

Depending on the firm and/or industry characteristics, the firm's performance ranking may fluctuate significantly, providing a less informative signal about changes to the firm's competitive advantage within the industry. For instance, if rivals are able to imitate the strategies of the firm relatively easily, then an increase in the firm's performance ranking is expected to reverse quickly, leading to volatile performance ranking changes. In this case, investors are more likely to view changes to the firm's performance ranking in the current period as a temporary fluctuation rather than an indication of a persistent shift in the firm's competitive advantage within the industry. However, if the past volatility of the firm's performance ranking is low, we anticipate that the change in the firm's performance ranking in the current period provides investors with a more informative signal of how the firm's competitive position within the industry has shifted, leading to a greater investor response. Therefore, we predict that investors react stronger (weaker) to a change in the firm's performance ranking when the volatility of the firm's past performance rankings is lower (higher). Our hypothesis is stated in alternative form below.

*H2 – Investors react more (less) strongly to a change in the firm's performance ranking when the past volatility of the firm's past performance ranking is low (high).*

The prior literature suggests that managers use various methods to manipulate either analyst forecasts or earnings to meet or beat analyst expectations. For example, prior studies examine whether managers use accrual manipulation (e.g., Abarbanell and Lehavy, 2003; Burgstahler and Eames, 2006), expectations management (e.g., Matusmoto, 2002), real activities manipulation (e.g., Roychowdhury,

2006), and non-GAAP earnings manipulation (e.g., Doyle et al., 2013) to opportunistically exceed analyst expectations. In addition, Graham et al. (2005) survey corporate executives and document that corporate executives have strong incentives to manipulate earnings to meet or beat analyst expectations due to the pressure from capital markets. Therefore, if the relative performance of the firm within the industry is another important benchmark that investors use to evaluate firm performance, we anticipate that management also has incentives to opportunistically manipulate earnings to improve the firm's performance ranking within the industry.

Despite the wide range of methods that managers can utilize to manipulate the firm's performance ranking, we anticipate that managers are likely to rely on the opportunistic exclusion of expenses from non-GAAP earnings when manipulating the firm's performance ranking (e.g., Doyle et al. 2013). Manipulating the firm's earnings to increase its performance ranking is different from manipulating earnings to meet or exceed analyst expectations. Analyst expectations are typically determined a couple weeks prior to the announcement of earnings. Managers are able to observe the analysts' expectations and choose the method that is most appropriate to meet or beat those expectations. However, the change in the firm's performance ranking is dynamic in that the performance ranking is determined by both the firm's earnings as well as peer firms' earnings. Put differently, the firm's performance ranking in the industry could change anytime a peer firm within the industry announces earnings or when analysts revise their expectations for peer firms within the industry.

As a result, manager's ability to manipulate earnings through the management of real activities, accruals, and market expectations is substantially reduced. Managing earnings through the manipulation of real activities likely requires a significant amount of planning and time, which generally happens prior to the fiscal period end. Analyst expectations could be managed downward prior to observing earnings of other firms in the industry; however, the manager would not know how much he/she would have to manage analyst expectations downward if other firms' earnings have not been revealed. Therefore, the management of analyst expectations is likely less effective when managers are attempting to improve the firm's relative performance ranking. Discretionary accruals require journal entries and require planning

and justification to the auditor, reducing the likelihood that the manager is able to use discretionary accruals to manipulate the performance ranking of the firm. Unlike the aforementioned earnings management tools, redefining non-GAAP earnings (i.e., opportunistically excluding expenses from non-GAAP earnings) does not require journal entries or extensive justification to the auditor. Therefore, we expect that redefining non-GAAP earnings is the most effective method for managers to increase the performance ranking of the firm. We specifically predict that managers exclude expenses from non-GAAP earnings to improve the firm's performance ranking within the industry. We state our hypothesis in alternative form below.

*H3 –* *Managers exclude expenses from non-GAAP earnings to increase the firm's relative performance ranking within the industry.*

Doyle et al. (2013) find that firms that are more likely to opportunistically exclude expenses from non-GAAP earnings have earnings surprises that are less informative to investors. Doyle et al. (2013) specifically document that the market reaction to the earnings surprise is discounted when investors suspect that mangers have opportunistically used income-increasing exclusions to artificially meet or beat analyst expectation. Similarly, if investors suspect that managers are opportunistically using exclusions to increase the firm's performance ranking, we expect investors to discount changes to the firm's performance ranking. We state the related hypothesis in alternative form below.

*H4 –* *Investors' reaction to the firm's relative performance ranking changes in the industry is weaker when the change in the firm's relative performance ranking is coupled with the exclusion of expenses from non-GAAP earnings.*

## 3. Empirical Design

### 3.1. The Market's Reaction to Changes in Performance Rankings

In Hypothesis 1, we predict that investors positively (negatively) react to an increase (decrease) in the firm's relative performance ranking within the industry. In the main analyses, we use the Global Industry Classification Standard (GICS) codes to define the industry to which a firm belongs. Bhojraj et

al. (2003) document that firms in the same GICS classifications have higher profitability and growth correlations than firms that share the same Standard Industrial Classification (SIC) codes, North American Industry Classification System (NAICS) codes, and Fama-French classification codes. They conclude that GICS is a better industry classification to identify industry peers that compete in similar product markets.

Using GICS codes to define the industry, we measure the change in the firm's performance ranking within the industry on the date of the firm's earnings announcement. While we could examine the change in the firm's performance ranking at various points during the fiscal period, we choose the earnings announcement date for two reasons. First, the earnings announcement is a significant firm event that reveals information about the firm, prompting investors to evaluate and revise their expectations about the firm's performance ranking. Second, earnings are released during the earnings announcement, allowing us to examine the market's response to the change in the firm's performance ranking relative to the market's response to the earnings surprise. Therefore, we can control for the firm's earnings surprise in the regression analyses, allowing us to isolate the incremental effect of the change in the firm's performance ranking on stock returns. We employ the following regression model to examine investors' response to changes in the firm's performance ranking.

$$\begin{aligned} 3DayRet_{i,t} = \quad & \alpha + \beta_1 \Delta Ranking_{i,t} + \beta_2 Surprise_{i,t} + \beta_3 STD\_\Delta Ranking_{i,t} + \beta_4 Initial\ Ranking_{i,t} + \\ & \beta_5 HHI_{j,t} + \beta_6 \Delta Industy\text{-}Adjusted\ ROA_{i,t} + \beta_7 SalesGrowth_{i,t} + \beta_8 Book\text{-}to\text{-}Market_{i,t} + \\ & \beta_9 \ln(Size_{i,t}) + \beta_{10} Accruals_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{1}$$

The subscript *i*, *j*, and *t* represent the firm, the industry, and fiscal quarter, respectively. The dependent variable is the $3DayRet_{i,t}$ variable, which is equal to the three-day market-adjusted buy-and-hold abnormal return centered on the earnings announcement for firm *i* in quarter *t*. The main independent variable of interest is the $\Delta Ranking_{i,t}$ variable, which is measured as firm *i*'s performance ranking within the industry on the earnings announcement date in quarter *t* (i.e., $Realized\ Ranking_{i,t}$) less firm *i*'s performance ranking within the industry two days prior to the earnings announcement date in

quarter *t* (i.e., *Initial Ranking*$_{i,t}$), divided by the total number of firms in the industry. We more explicitly discuss the calculation of the $\Delta$*Ranking*$_{i,t}$ variable below.

The *Initial Ranking*$_{i,t}$ variable is equal to the expected earnings of firm *i* based on the consensus earnings per share (EPS) forecast, which is the median analyst forecast calculated two days prior to the earnings announcement in quarter *t*.[7] If the consensus EPS forecast is missing, the expected earnings of firm *i* is equal to the IBES-reported actual EPS in quarter *t-4*, which assumes that expected earnings follow a seasonal random walk (e.g., Freeman and Tse, 1989; Bernard and Thomas, 1990). We then rank the expected earnings for firm *i* with the realized or expected earnings for all other firms sharing the same GICS code (i.e., peer firms) on the same date. If peer firms have already announced earnings, we use realized earnings. If peer firms have not already announced earnings, we calculate the expected earnings for peer firms following the same procedure described above. Prior to calculating the initial ranking of the firm *i* in quarter *t*, we standardize the realized and expected earnings for all firms in the industry by multiplying each EPS figure by the number of shares (depending on the IBES basic/diluted flag) adding total interest expense multiplied by one less marginal tax rates, and dividing by the average total assets for each firm (i.e., return on assets = (net income + interest expense× (1 – Marginal Tax Rate)) / Average Total Assets).[8,9]

We calculate the realized ranking of firm *i* in quarter *t* at the earnings announcement date (i.e., *Realized Ranking*$_{i,t}$) similarly to how we calculated the *Initial Ranking*$_{i,t}$ variable with the one exception. Instead of using expected earnings for firm *i*, we use the realized earnings for firm *i* that are announced at the earnings announcement date for quarter *t*. We then rank firm *i*'s realized earnings relative to peer

[7] We calculate the *daily* median EPS consensus analyst forecast using the I/B/E/S unadjusted detail file. We specifically calculate the median EPS consensus based on individual analyst forecasts, which are required to be reported within the 90-day window immediately preceding the consensus forecast date to ensure that our analyst consensus is not based on stale forecasts. We exclude individual analyst forecasts if I/B/E/S excludes the forecasts from calculating IBES-reported median EPS consensus. If the daily median EPS consensus analyst forecast is missing, we supplement our data by using IBES-reported median EPS consensus forecasts (i.e., IBES item *MEDEST*). All our results remain unchanged when we do not supplement our data.

[8] Marginal tax rate is assumed as the top statutory federal tax rate plus 2% average state tax rate (Nissim and Penman 2003).

[9] All our results remain the same if we do not add back interest expenses. In addition, all results remain the same if we use total sales (i.e., profit margin), book value of equity, or market value of equity as a deflator.

firms' realized or expected earnings, depending on whether or not peer firms have announced their earnings on the earnings announcement date of firm *i* in quarter *t*.

To finally finish the calculation of the $\Delta Ranking_{i,t}$ variable, we subtract the *Initial* $Ranking_{i,t}$ variable from the *Realized* $Ranking_{i,t}$ variable and divide by the number of firms in the industry. We anticipate finding a positive coefficient on the $\Delta Ranking_{i,t}$ variable in equation (1), which is consistent with investors positively valuing an improvement to the firm's performance ranking in the industry.

We also include several control variables in the model that are likely to be simultaneously associated with performance ranking changes and the market's reaction to the earnings announcement. All variables are also defined in Appendix A. The $Surprise_{i,t}$ variable is the earnings surprise for firm *i* in quarter *t*, which is equal to the IBES-reported Actual EPS figure less the expected earnings, which is either the median consensus analyst forecast or, if analyst forecast is missing, IBES-reported Actual EPS in quarter *t-4*, divided by stock price at the end of quarter *t*. The $STD\_\Delta Ranking_{i,t}$ variable is the standard deviation of the $\Delta Ranking_{i,t}$ variable over the previous 16 quarters (we require a minimum of 8 quarter observations), which is converted to range between zero and one.[10] The *Initial* $Ranking_{i,t}$ variable is the performance ranking of firm *i* two days prior to the earnings announcement date for quarter *t* and is described above in detail. The $HHI_{j,t}$ variable is the Herfindahl-Hirchman Index, measured as the sum of squared market shares of all firms in an industry during quarter *t*. The $\Delta$*Industry-Adjusted* $ROA_{i,t}$ variable is measured as changes in firm *i's* industry-adjusted return on assets between quarter *t* and quarter *t-4*. Once again, industry is defined as firms in the same GICS code. The *Book-to-Market*$_{i,t}$ variable is calculated by dividing the book value of equity by the market value of equity at the end of quarter *t*. The *SalesGrowth*$_{i,t}$ variable is equal to net sales in quarter *t* divided by net sales in quarter *t-4*. The ln($Size_{i,t}$) variable is equal to the natural logarithm of the market value of equity at the end of quarter *t*. *Accruals*$_{i,t}$ is measured as firm *i*'s GAAP EPS less cash flows from operations per share in quarter *t* divided by the

[10] We do this conversion using the stata command *cumul* (i.e., cumulative distribution function), which we do because our cross-sectional test of *H2*, which uses the volatility of past ranking changes as a conditioning variable. By using this converted variable, the estimated coefficients can be easily interpreted to determine the extent of the market reaction to performance ranking changes at different percentile of the distribution of the volatility of past ranking changes (e.g., Aggarwal and Samwick, 1999). All results remain the same if we use original values.

stock price at the end of quarter *t*. For all our tests, we cluster the standard errors by calendar quarter and firm to correct for cross-sectional and serial-correlation in the standard errors (Petersen, 2009).

In an additional robustness test, all independent variables in equation (1) are decile-ranked to facilitate the comparison between the market's reaction to the earnings surprise ($Surprise_{i,t}$) and the market's reaction to the change in the performance ranking ($\Delta Ranking_{i,t}$). We create decile-ranked variables by ranking each variable into deciles (i.e., 0 through 9) and dividing by 9. The coefficients on the decile-ranked variables represent the market's reaction to an increase from the 1st to 10th decile of each variable. Using the decile-ranked variables, we are able to compare the economic magnitude of the difference between the market's reaction to an increase in the firm's performance ranking and the market's reaction to an increase in the firm's earnings surprise.

Hypothesis 2 predicts that the market reaction to an improvement in the firm's performance ranking is stronger (weaker) when the firm's performance ranking has been stable (volatile) in the recent past, making the current quarter's ranking change more (less) notable and informative to investors. To test this hypothesis, we include the $\Delta Ranking_{i,t} \times STD\_\Delta Ranking_{i,t}$ interaction in equation (1) and expect a negative coefficient on this interaction variable.

$$\begin{aligned} 3DayRet_{i,t} = \quad & \alpha + \beta_1 \Delta Ranking_{i,t} + \beta_2 STD\_\Delta Ranking_{i,t} + \beta_3 \Delta Ranking_{i,t} \times STD\_\Delta Ranking_{i,t} + \\ & \beta_4 Surprise_{i,t} + \beta_5 Initial\ Ranking_{i,t} + \beta_6 HHI_{j,t} + \beta_7 \Delta Industy\text{-}Adjusted\ ROA_{i,t} + \\ & \beta_8 SalesGrowth_{i,t} + \beta_9 Book\text{-}to\text{-}Market_{i,t} + \beta_{10} \ln(Size_{i,t}) + \beta_{11} Accruals_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{2}$$

All variables are as previously defined and are defined in Appendix A. As noted earlier, the $STD\_\Delta Ranking_{i,t}$ variable ranges from zero to one; therefore, the estimated coefficient on the interaction between the $\Delta Ranking_{i,t}$ and $STD\_\Delta Ranking_{i,t}$ variables can be easily interpreted (e.g., Aggarwal and Samwick 1999). The coefficient on the interaction represents the change in the market's response to the firm's performance ranking changes as the $STD\_\Delta Ranking_{i,t}$ variable moves from its 1st to 99th percentiles of its distribution. That is, a negative coefficient on the interaction between the $\Delta Ranking_{i,t}$ and $STD\_\Delta Ranking_{i,t}$ variables suggests that the market's reaction to a change in the firm's performance ranking is muted when the volatility of the firm's past performance ranking changes increases.

3.2. Managers' Use of Exclusions and Changes in Performance Rankings

We now present the empirical design we use to examine Hypothesis 3, which predicts that managers opportunistically use non-GAAP exclusions to increase the firm's performance ranking. To test this prediction, we use the following regression model, in which the $\Delta Ranking_{i,t}$ variable is specified as the dependent variable.

$$\begin{aligned}\Delta Ranking_{i,t} = {} & \alpha + \beta_1 Pos\ Other\ Excl\ Use_{i,t} + \beta_2 Pos\ Special\ Items\ Use_{i,t} + \beta_3 Book\text{-}to\text{-}Market_{i,t} + \\ & \beta_4 SalesGrowth_{i,t} + \beta_5 \ln(Size) + \beta_6 \Delta Industy\text{-}Adjusted\ ROA_{i,t} + \beta_7 Profitable_{i,t} + \\ & \beta_8 MBE_{i,t} + \beta_9 \ln(NUMEST_{i,t}) + \beta_{10} HHI_{j,t} + \beta_{11} STD\_\Delta Ranking_{i,,t} + \beta_{12} Initial \\ & Ranking_{i,t} + \varepsilon_{i,t}\end{aligned} \quad (3)$$

The independent variable of interest is the *Pos Other Excl Use*$_{i,t}$ (*Pos Special Item Use*$_{i,t}$) variable, which is an indicator variable equal to one if other exclusions (special Items) are positive; otherwise zero. To calculate the *Pos Other Excl Use*$_{i,t}$ (*Pos Special Item Use*$_{i,t}$) variable, we first identify the total amount of exclusions by subtracting GAAP EPS from IBES-reported Actual EPS (Doyle et al., 2013). We define GAAP EPS as earnings per share before extraordinary items and discontinued operations, using either basic or diluted EPS, depending on the IBES basic/diluted flag. Next, we divide the total amount of exclusions into expected and unexpected exclusions, which we proxy for using special items and other exclusions, respectively. We define special items as operating income per share less GAAP EPS. We then define other exclusions as total exclusions less special items, which capture the unexpected income-increasing exclusions.

Positive other exclusions and special items capture expenses that are excluded from non-GAAP earnings but included in GAAP earnings. If analysts understand and can estimate the expenses that managers exclude from non-GAAP earnings, analysts should also exclude these expenses from their forecasts. Therefore, if the magnitude or existence of expenses excluded from non-GAAP earnings are expected by analysts, then management's use of other exclusions or special items should not mechanically result in an improvement to the performance ranking of the firm since the firm's initial and realized ranking are prepared on the same basis (Doyle et al., 2013). However, since management can

manipulate exclusions, managers have the opportunity to exclude recurring expenses from non-GAAP earnings that are not expected by analysts, potentially increasing the performance ranking of the firm. Consistent with this argument, Doyle et al. (2003) find that other exclusions predict negative future operating cash flows, suggesting that other exclusions have recurring expense properties. Consistent with Doyle et al. (2003), Doyle et al. (2013) find that other exclusions are more likely to be associated with meeting or beating analyst expectations compared to special items. This evidence is consistent with management strategically classifying recurring expenses as other exclusions to increase non-GAAP earnings.

If managers primarily use other exclusions to influence the firm's performance ranking then we would expect to observe a significantly positive coefficient on the *Pos Other Excl Use*$_{i,t}$ variable and an insignificant coefficient on the *Pos Special Item Use*$_{i,t}$ variable. However, it is possible that we find a positive coefficient on the *Pos Special Item Use*$_{i,t}$ variable if analysts are not able to perfectly anticipate and identify special items without any bias. Regardless of whether the coefficient on the *Pos Special Item Use*$_{i,t}$ variable is positive, we expect the coefficient on the *Pos Special Item Use*$_{i,t}$ variable to be significantly lower than the coefficient on the *Pos Other Excl Use*$_{i,t}$ variable.

Following Doyle et al. (2013), we include several other control variables that are not included in regression (1). The *Profitable*$_{i,t}$ variable is an indicator variable equal to one if firm *i's* IBES-reported Actual EPS in quarter *t* is positive, zero otherwise. The *MBE*$_{i,t}$ variable is intended to control the effect of positive exclusions on the likelihood of meeting or beating analyst expectations (Doyle et al., 2013) and is equal to one if firm *i's* earnings surprise in quarter *t* is non-negative, zero otherwise. The ln(*NUMEST*$_{i,t}$) variable is the natural logarithm of the number of analysts following firm *i* in quarter *t*.

3.3. The effect of exclusions on the market's reaction to the firm's performance ranking changes

In H4, we predict that the market's response to the change in the performance ranking will be discounted if the market can identify firms that are more likely to be manipulating earnings to improve the firm's performance ranking. We estimate the below regression to test H4.

$$3DayRet_{i,t} = \alpha + \beta_1 \Delta Ranking_{i,t} + \beta_2 Pos\ Other\ Excl\ Use_{i,t} + \beta_3 \Delta Ranking_{i,t} \times Pos\ Other\ Excl\ Use_{i,t} + \beta_4 Pos\ Special\ Items\ Use_{i,t} + \beta_5 \Delta Ranking_{i,t} \times Pos\ Special\ Items\ Use_{i,t} + \beta_6 Surprise_{i,t} + \beta_7 STD\_\Delta Ranking_{i,t} + \beta_8 Initial\ Ranking_{i,t} + \beta_9 HHI_{j,t} + \beta_{10} \Delta Industy\text{-}Adjusted\ ROA_{i,t} + \beta_{11} SalesGrowth_{i,t} + \beta_{12} Book\text{-}to\text{-}Market_{i,t} + \beta_{13} \ln(Size_{i,t}) + \beta_{14} Accruals_{i,t} + \varepsilon_{i,t} \quad (4)$$

The coefficient on the $\Delta Ranking_{i,t} \times Pos\ Other\ Excl\ Use_{i,t}$ interaction is the primary coefficient of interest. If the firm's use of positive other exclusions increases the likelihood that firms are opportunistically manipulating earnings to influence market participants' perception on the firm's performance ranking, then a negative coefficient on the interaction between the $\Delta Ranking_{i,t}$ and *Pos Other Excl* $Use_{i,t}$ variables would suggest that investors discount changes in the firm's performance ranking when the likelihood of earnings manipulation is higher.

## 4. Data and Descriptive Statistics

Data for our empirical tests were obtained from the intersection of I/B/E/S, COMPUSTAT, and CRSP. We start our analysis in 1995 because individual analyst forecasts are relatively sparse prior to 1995 (Clement et al., 2011). Since one of our main control variables, $STD\_\Delta Ranking_{i,t}$, requires at least past 8 quarters of data, our sample period ranges from 1997 to 2013. We retrieve quarterly financial statement data from COMPUSTAT and daily stock return data from CRSP. We require at least 10 firm-quarter observations in each industry for each quarter to calculate the performance ranking changes for each firm in the industry. We only keep firm/quarter observations with fiscal quarter ends of March, June, September, and December.[11] We also require firm/quarter observations to have sufficient data to calculate the independent and dependent variables in each regression. Our final sample consists of 203,056 firm-quarter observations ranging from 1997 to 2013. The number of observations in any particular test varies

[11] We include only firms that have calendar/quarter fiscal period ends to ensure that the earnings windows are the same for each firm in the industry. For example, we do not want to compare earnings that are generated from September to November for one firm to earnings that are generated from October to December of another firm because there could be an industry or market shock in December that make the earnings of the two firms less comparable.

depending on the availability of data necessary for each test. All continuous variables are winsorized at 1% and 99%.

Panel A of Table 1 presents descriptive statistics for the full sample. We note that the average (median) change in the firm's performance ranking ($\Delta Ranking_{i,t}$) is 0.004 (0.000). The average (median) earnings surprise ($Surprise_{i,t}$) is -0.004 (0.010). We note that the average and median changes in the $\Delta Ranking_{i,t}$ and $Surprise_{i,t}$ variables are reasonably close to zero. We expected the mean and median values to be close to zero for the $\Delta Ranking_{i,t}$ variable given its construction. The mean and median values for the $Surprise_{i,t}$ variable suggests that analyst forecasts are relatively unbiased. Mean and the median values of all other variables are similar to those reported in prior research. For instance, the mean of the MBE variable is 0.64, suggesting that the majority of firms (64%) meet or beat their earnings expectations. The mean (median) book-to-market ratio is 0.668 (0.519) and the mean (median) sales growth is 1.148 (1.076), which are both similar values to those found in prior studies (e.g., Doyle et al., 2013).

Table 2 reports the Pearson and Spearman correlations for the primary variables in our study. We provide preliminary support for our first hypothesis by finding a positive correlation between the $3DayRet_{i,t}$ and $\Delta Ranking_{i,t}$ variables, suggesting that investors positively value changes in the firm's performance ranking. We also find a positive correlation between the $3DayRet_{i,t}$ and $Surprise_{i,t}$ variables, which is consistent investors positively responding to unexpected earnings. The $\Delta Ranking_{i,t}$ variable is also positively correlated with the $Surprise_{i,t}$ variable (Pearson correlation 0.61), the $Profitable_{i,t}$ variable (Pearson correlation 0.25), and the $\Delta Industry\text{-}Adjusted\ ROA_{i,t}$ variable (Pearson correlation 0.40), suggesting that firms that have a greater earnings surprise, are profitable, and have better industry-adjusted performance are more likely to experience an increase in its performance ranking.[12] This further highlights the need to control for various measures of the firm's performance in our multivariate regressions analyses.

[12] Given the higher correlation between the $\Delta Ranking_{i,t}$ variable and other performance controls, we check the Variance Inflation Factor (VIF) in all subsequent regression analyses and find that multicollinearity problem is not present in our analyses.

Panel A of Table 3 presents descriptive statistics on the likelihood that firms maintain their performance ranking when they announce earnings. Using the *Initial Ranking*$_{i,t}$ variable, we divide the firm/quarter observations into quintiles, which are denoted in the first column of Panel A. We also divide the firm/quarter observations into quintiles using the *Realized Ranking*$_{i,t}$ variable, which are denoted in the first row of Panel A. The number and percentage of firm/quarter observations that are categorized into each *Initial Ranking*$_{i,t}$ quintile and *Realized Ranking*$_{i,t}$ quintile are found at the intersection of these two quintile categories. As we expected, we find that firms are more likely to maintain their performance rankings. For example, approximately 75% of the firm/quarter observations that are initially ranked to be in the 1$^{st}$ performance quintile end up having a realized ranking in the same 1$^{st}$ performance quintile. We also note that the likelihood of a firm changing its performance ranking decreases as we move away from the diagonal (i.e., firms maintaining the same initial and realized performance ranking deciles). For example, only 2% of the firm/quarter observations are initially ranked as being in the 1$^{st}$ performance quintile and end up having a realized ranking in the 4$^{th}$ performance quintile. This evidence suggests that performance rankings are relatively stable. As a result, a change in the performance ranking of the firm is more likely to provide information to investors about a notable change to the performance of the firm.

Similarly to how we examine the number and percentage of firms that change performance rankings in Panel A, we also examine the market reaction when a firm experiences a change in performance ranking in Panel B of Table 3. The market reaction is measured as the three-day market-adjusted stock returns surrounding the earnings announcement. Similar to Panel A, we include each *Initial Ranking*$_{i,t}$ quintile in the first column and each *Realized Ranking*$_{i,t}$ quintile in the first row of the table. The values that lie at the intersection of each *Initial Ranking*$_{i,t}$ and *Realized Ranking*$_{i,t}$ quintile represent the average market reaction for those firms that fall into this category. For example, we find that firms with an initial ranking in the 1$^{st}$ quintile that end with a realized ranking in the 5$^{th}$ decile experience market returns of 0.027 on average, which is significant at the 1% level. In Panel B of Table 3, we find that the average stock returns are strictly monotonic across all realized ranking quintiles within each initial ranking quintile. For example, a firm with an initial ranking in the 1$^{st}$ quintile would experience a

monotonic increase in average stock returns as the firms' realized ranking moves from 1st quintile to the 5th quintile. That is, the market reaction appears to increase (decrease) when the realized performance improves (deteriorates) relative to the initial performance, providing additional univariate evidence in support of our first hypothesis .[13]

Figure 1 graphically depicts the average market reactions across realized ranking quintiles for each initial ranking quintile. For example, Figure 1a provides a graphical representation of how realized returns increases from the 1st to 5th realized ranking quintile when the firm's initial ranking is in the 1st quintile. The vertical axis represents average market-adjusted stock returns and the horizontal axis represents realized ranking quintiles. Each graph in Figure 1 provides graphical evidence that the average stock returns are strictly monotonic across realized ranking quintiles within each initial ranking quintile, which is consistent with our first hypothesis.

To further check the overall average effect on returns as the performance ranking changes, we examine the average returns when the performance ranking of the firm increases or decreases by one, two, three, and four quintiles. For example, we compute the average return for all firms that increase one quintile (e.g., initial ranking is equal to 1 and the realized ranking is equal to 2) and include it under the category "+1". Similarly, we compute the average return for all firms that increase two quintiles (e.g., initial ranking is equal to 2 and the realized ranking is equal to 4) and include it under the category "+2". Figure 2 provides graphical evidence that market reactions increase monotonically as firms experience greater ranking changes relative to their initial performance rankings, providing additional univariate support for our first hypothesis.

Taken together, the results in Table 3, Figure 1, and Figure 2 are consistent with our first hypothesis that investors positively (negatively) value an increase (decrease) in the firm's relative performance ranking. However, we note that the market reactions examined in Panel B of Table 3 does

[13] We also note that nearly monotonic relations in average returns are observed as we move from the 1st to 5th initial ranking quintile within each realized ranking quintile. However, we believe that examining how the average return changes as we move from the 1st to 5th realized ranking quintile within each initial ranking quintile is more intuitive because the initial ranking is first observed by investors and the realized ranking is subsequently realized.

not include control variables and other performance measures that are correlated with the change in the firm's performance ranking, and thus, the result may not indicate the *incremental* effect of the change in the firm's performance ranking. We attempt to estimate the incremental effect on the market reaction after controlling other performance measure in the multivariate regression analysis in the next section.

## 5. Empirical Results

### 5.1. Results for H1: Market reactions to performance ranking changes

In Hypothesis 1, we predict that stock returns surrounding earnings announcement dates are positively correlated with the firm's performance ranking changes within the industry after controlling the effect of the earnings surprise along with other specific firm and industry characteristics. Table 4 presents the results from equation (1) with the three-day buy-and-hold abnormal returns ($3DayRet_{i,t}$) surrounding the earnings announcement date as the dependent variable and the firm's performance ranking changes ($\Delta Ranking_{i,t}$) as the primary independent variable of interest. In column (1) and (2), we omit the control variables from the analysis and include the $\Delta Ranking_{i,t}$ and $Surprise_{i,t,}$ variables in separate regressions. We find a positive and significant (1% level) coefficient on both the $\Delta Ranking_{i,t}$ variable as well as the $Surprise_{i,t,}$ variable in column (1) and (2), respectively. This evidence is consistent with investors positively (negatively) valuing an increase (decrease) in the firm's performance ranking and an unexpected increase (decrease) in earnings. We note that the $R^2$ is equal to 3.9% when the $\Delta Ranking_{i,t}$ variable is the independent variable in column (1) and 1.9% when the $Surprise_{i,t,}$ variable is the independent variable in column (2). Using a Vuong (1989) test, we find that the $R^2$ calculated when the $\Delta Ranking_{i,t}$ variable is the independent variable is statistically greater (Z-statistics = 21.312) than the $R^2$ calculated when the $Surprise_{i,t,}$ variables is the dependent variable, suggesting that changes in performance rankings explain more of the variation in the three-day market reaction around the earnings announcement than the earnings surprise.[14]

[14] We find the same result when we include control variables in each regression.

In column (3), we include both the $\Delta Ranking_{i,t}$ and $Surprise_{i,t,}$ variables together in the same regression. We find positive and significant coefficients on both variables, consistent with investors positively valuing an improvement in the firm's relative performance ranking as well as unexpected earnings. This evidence also suggests that the change in the firm's performance ranking conveys incremental information to the capital markets over the earnings surprise. It is also worth noting that the magnitude of coefficient on the $Surprise_{i,t}$ variable is substantially reduced in column (3) relative to column (2) while the magnitude of coefficient on the $\Delta Ranking_{i,t}$ variable remains relatively the same in column (3) relative to column (1). This evidence further suggests that the $\Delta Ranking_{i,t}$ variable provides information distinct from information contained in the earnings surprise. In column (4) of Table 4, we include control variables to reduce the likelihood of correlated omitted variables. We continue to find that the coefficients on the $\Delta Ranking_{i,t}$ and $Surprise_{i,t,}$ variables are significantly positive at the 1% level.

To gauge the relative effect of a change in the relative performance ranking of the firm and the earnings surprise, we report the regression results using decile-ranked independent variables, as described in Section 3, in column (5). The coefficient on the decile-ranked $\Delta Ranking_{i,t}$ variable is equal to 0.033 and continues to be significant at the 1% level. Similarly, the coefficient on the $Surprise_{i,t,}$ variable is significant at the 1% level and is equal to 0.038. The coefficient on each of the decile-ranked independent variables can be interpreted as the change in dependent variable as the independent variable moves from the $1^{st}$ to $10^{th}$ decile. Therefore, the positive coefficient on the decile-ranked $\Delta Ranking_{i,t}$ ($Surprise_{i,t}$) variable implies that an increase in the $\Delta Ranking_{i,t}$ ($Surprise_{i,t}$) variable from the $1^{st}$ to $10^{th}$ decile results in a 3.3% (3.8%) three-day buy-and-hold abnormal return, which we believe is economically significant. The effect of the change in the firm's performance ranking ($\Delta Ranking_{i,t}$) on the firm's returns appears to be approximately 86.8% (= 0.033/0.038) of the effect of the firm's earnings surprise on the firm's returns. In summary, the results in Table 4 suggest that the improvement in the firm's performance ranking is an important metric that investors use to assess the firm's performance. These results also suggest that investors evaluate firm performance based on the entire distribution of earnings in the industry rather than just based on analyst expectations of performance.

5.2. Results for H2: Market reactions to performance ranking changes conditioning on the volatility of past performance ranking changes

We next examine Hypothesis 2, which predicts that investors' response to a change in the firm's performance ranking in the current period is more (less) pronounced when the firm's volatility in past performance ranking changes is low (high). Table 5 presents the estimation results. In column (1), we find a positive and significant (1% level) coefficient on the $\Delta Ranking_{i,t}$ variable, suggesting that the market reaction to changes in the performance ranking is greatest when the volatility of past performance ranking changes is in its lowest percentile of the distribution. Consistent with expectations, we find a negative and significant (1% level) coefficient on the $\Delta Ranking_{i,t} \times STD\_\Delta Ranking_{i,t}$ interaction, suggesting that the market reaction decreases as the volatility of past performance ranking increases. We re-preform our analysis using decile-ranked independent variables in column (2). The coefficient on the decile-ranked $\Delta Ranking_{i,t}$ variable in column (2) suggest that the market reaction to an increase from the 1st to 10th performance ranking decile is equal to 5.2% when the $STD\_\Delta Ranking_{i,t}$ variable is in its lowest percentile of the distribution. The interaction between the $\Delta Ranking_{i,t}$ and $STD\_\Delta Ranking_{i,t}$ variables is equal to -0.034, suggesting that the market reaction to an increase from the 1st to 10th performance ranking decile is equal to 1.8% (1.8% = 0.052 – 0.034) when the $STD\_\Delta Ranking_{i,t}$ variable is in its highest percentile of the distribution.[15] We also find that the sum of the coefficients on the $\Delta Ranking_{i,t}$ variable and the $STD\_\Delta Ranking_{i,t} \times \Delta Ranking_{i,t}$ interaction is still positive and significant at the 1% level. Compared to earnings surprise, the market's reaction to the change in the firm's performance ranking is approximately 130% (45%) of the market's reaction to the earnings surprise when the volatility of the firm's past performance ranking changes is in its lowest (highest) percentile of the distribution.

5.3. Results for H3: Earnings manipulation and changes in performance ranking

In Hypothesis 3, we predict that management has incentives to manipulate earnings to affect the firms' performance ranking within the industry. We present our results using equation (3) in Table 6.

[15] The market response to the firm's performance ranking change at the median percentile of the distribution of the volatility of past ranking changes is equal to 0.052 – (1/2)*0.034 = 0.035, and we note that this estimate is similar to the estimate in the full sample as reported in the column (5) in Table 4.

Consistent with our expectation, we find positive coefficients on the *Pos Other Excl Use*$_{i,t}$ variable and the *Pos Special Items Use*$_{i,t}$ variable, which are significant at the 1% level. This evidence suggests that both the use of positive other exclusions and special items are associated with the change in the firm's performance ranking. As we noted earlier, if analysts are not able to perfectly anticipate and identify special items without any biases, it is not surprising that we find a positive coefficient on the *Pos Special Item Use*$_{i,t}$ variable. We test the difference between those two coefficients and find that the coefficient on the *Pos Other Excl Use*$_{i,t}$ variable is significantly greater than the coefficient on the *Pos Special Items Use*$_{i,t}$ variable at the 1% level (F-statistics equal to 37.09).

Similar to Doyle et al. (2013), we also examine whether *negative* other exclusions are associated with decreases in the firm's performance ranking. Doyle et al. (2013) provide evidence that negative other exclusions do not decrease the likelihood of the firm meeting or beating analyst expectations while positive other exclusions increase the likelihood. They do this to provide evidence the exclusions do not mechanically affect the likelihood of meeting or beating expectations. In an untabulated test, we include an indicator variable for both negative and positive other exclusions as well as negative and positive special items and find that the use of *negative* other exclusions is not associated with decreases in the firm's performance ranking, suggesting that the relation between the use of positive other exclusions and the change in the firm's performance ranking is not mechanical. This evidence is consistent with managers using other exclusions, which are more likely to be used opportunistically, to manipulate the relative performance ranking of the firm.

### 5.4. Results for H4: Differential market responses to performance ranking changes when the likelihood of manipulation increases

In this section, we examine H4, which predicts that the market discounts its response to the change in the firm's performance ranking when the likelihood of manipulation is the highest. Table 7 presents the regression results using equation (4). We find a significantly positive coefficient on the $\Delta Ranking_{i,t}$ variable, which is consistent with H1. We find a negative and significant (5% level) coefficient on the $\Delta Ranking_{i,t} \times$ *Pos Other Excl Use*$_{i,t}$ interaction, which is consistent with our

expectations outlined in H4. The coefficient of -0.012, suggests that the market's reaction to an improvement in the firm's performance ranking is discounted approximately 12.1% (-0.121 = -0.012 / 0.099) when using positive other exclusions relative to the market reaction when positive other exclusions are not present. Interestingly, the sum of the coefficients on the $\Delta Ranking_{i,t}$ variable the $\Delta Ranking_{i,t} \times Pos\ Other\ Excl\ Use_{i,t}$ interaction is still positive and significant at the 1% level, suggesting that the market reaction to a change in the performance ranking of the firm is still positive when it is more likely that managers are manipulating the firm's performance ranking. In contrast to other exclusions, we find the statistically positive coefficient on the $\Delta Ranking_{i,t} \times Pos\ Special\ Items\ Use_{i,t}$ interaction, suggesting that the exclusion of special items are performing more of an informational role rather than opportunistic manipulation role, similar to the results in Kolev et al. (2008) and Doyle et al. (2013).

The results in Table 7 suggest that managers manipulate the performance ranking by excluding expenses from non-GAAP earnings. The results in Table 8 suggest that managers only partially discount an improvement to the firm's performance ranking. If investors were able to see through the manipulation, we would have expected the positive market reaction to an increase in the performance ranking of the firm to be eliminated. However, we argue that investors cannot necessarily unravel opportunistic exclusion because they are not always able to identify which exclusions are opportunistic. Doyle, Soliman, and Jennings (2013) provide evidence consistent with analyst not being able to reverse all opportunistic exclusions. If this is the case, the manager may still benefit from opportunistically excluding expenses from earnings to improve the performance ranking.

## 6. Additional tests

### 6.1. The effect of changes in performance rankings on ROA persistence

We argue that a change in the firm's performance ranking provides investors with information regarding changes to the firm's competitiveness within the product market, leading to more sustainable future profits. To support this argument, we examine whether firms with higher performance rankings or

increased performance rankings in the industry have greater earnings persistence using the following model.

$$ROA_{i,t+\tau} = \alpha + \beta_1 ROA_{i,t} + \beta_2 D\_Ranking_{i,t} + \beta_3 ROA_{i,t} \times D\_Ranking_{i,t} + \beta_4 Surprise_{i,t} + \beta_5 STD\_\Delta Ranking_{i,t} + \beta_6 Initial\ Ranking_{i,t} + \beta_7 HHI_{j,t} + \beta_8 \Delta Industy\text{-}Adjusted\ ROA_{i,t} + \beta_9 SalesGrowth_{i,t} + \beta_{10} Book\text{-}to\text{-}Market_{i,t} + \beta_{11} \ln(Size_{i,t}) + \beta_{12} Accruals_{i,t} + \varepsilon_{i,t} \quad (5)$$

The dependent variable is firm *i*'s return on assets ($ROA_{i,t+\tau}$) at period $t+\tau$. The coefficient on the $ROA_{i,t}$ variable reflects earnings persistence. The $D\_Ranking_{i,t}$ variable is either the decile-ranked firm *i*'s realized performance ranking at the earnings announcement date or the decile-ranked change in firm *i*'s performance ranking at the earnings announcement date. We interact the $ROA_{i,t}$ and the $D\_Ranking_{i,t}$ variables and expect to find a positive coefficient on this interaction, suggesting that firms with greater realized performance rankings or improvements in their performance rankings have higher earnings persistence. Table 8 presents the estimation results of the equation (5).

In column (1) of Panel A, the dependent variable is specified as the one-year-ahead same quarter return on assets ($ROA_{i,t+4}$) with the $ROA_{i,t}$ variable as the sole independent variable. In our sample, we find that average earnings persistence is 0.708 in column (1), which is similar to the level of earnings persistence reported in the prior studies (e.g., Dichev and Tang, 2008). In column (2), we include the decile-ranked realized ranking ($D\_Realized\ Ranking_{i,t}$) variable along with its interaction with the $ROA_{i,t}$ variable. We continue to find a positive and significant (1% level) coefficient on the $ROA_{i,t}$ variable equal to 0.683. We also find a positive and significant (1% level) coefficient on the interaction between the $ROA_{i,t}$ and the decile-ranked realized ranking ($D\_Realized\ Ranking_{i,t}$) variables, suggesting that the persistence of earnings increases for firms as the firm's realized performance ranking increases from its 1st to 10th decile. This result holds when we include other control variables in column (3). In column (4) and column (5), we use two-year-ahead same quarter return on assets ($ROA_{i,t+8}$) and three-year-ahead same quarter return on assets ($ROA_{i,t+12}$), respectively, as the dependent variable and continue to find consistent evidence supporting our prediction. In Panel B of Table 8, we use the decile-ranked variable of

changes in performance ranking ($D\_\Delta Ranking_{i,t}$) as a conditioning variable and continue to find results similar to those found in Panel A. Overall, the results in Table 8 corroborate our argument that a firm's performance ranking provides information concerning the firm's competitive advantages in the product market, which are associated with greater sustainable future profits.

6.2. Industry-adjusted buy-and-hold abnormal returns

We argue that changes in performance ranking provide information about the firm-specific component of performance as compared with the industry-wide or market-wide component of performance. In our main empirical tests, we use market-adjusted buy-and-hold abnormal returns to examine whether or not market participants respond to the firm's performance ranking changes. However, there is a possibility that the significantly positive coefficient on the $\Delta Ranking_{i,t}$ variable might contain industry-wide information and investors respond to the information. To rule out this possibility, we calculate industry-adjusted buy-and-hold abnormal stock returns at the earnings announcement date of each firm and we reperform our tests found in Table 4, which are found in Table 9.[16] Consistent with our expectations, we find significantly positive coefficient on the $\Delta Ranking_{i,t}$ variable in all specifications at the 1% level. We also note that the coefficients are very similar in Table 4 and 9. This evidence suggests that the $\Delta Ranking_{i,t}$ variable captures the firm-specific component of performance not the industry-specific component of performance and that market participants respond to the changes in the firm's performance ranking.

6.3. The changes in analyst recommendations surrounding earnings announcement

As an additional robustness test, we include changes in the consensus analyst recommendations to ensure that we are not documenting changes in analyst recommendations that might be occurring around the earnings announcement. Stickel (1985) provides evidence that the market reacts to changes in relative recommendations by Value Line Investments. Boni and Womack (2006) provide evidence that stock

[16] We specifically calculate the equal-weighted average stock returns using stock returns of all firms in the same industry (GICS codes) as firm *i* surrounding the firm *i*'s earnings announcement (excluding firm *i* from the calculation) and subtract it from firm *i*'s 3-day buy-and-hold stock returns, and use this industry-adjusted abnormal return as a dependent variable.

recommendations are associated with the rankings of firms within an industry. However, stock recommendations do not only reflect changes in the firm's performance ranking. Stock recommendations could also reflect industry trends or conditions.

Nevertheless, it is possible that a change in analyst recommendations coincide with changes in the relative performance of the firm within the industry. Therefore, we re-run each of our tests previously reported in this paper including the change in the consensus analyst recommendation as an additional independent variable to ensure that the abnormal returns surrounding the earnings announcement are not attributed to changes in analyst recommendations. All of our results are qualitatively and quantitatively similar after controlling analyst recommendation changes surrounding the earnings announcement except for results documented in Table 7. However, we note that the number of observations is substantially decreased from 203,506 to 91,268 when we include the change in the consensus analyst recommendation as an additional control variable, which could result in a lower powered test.

### 6.4. Additional Alternative Specifications

We perform several additional tests to examine the robustness of our results. In our first test, we delete all observations in which there is no change between the initial and realized performance ranking and rerun our main results found in Table 4. In untabulated results, we find qualitatively similar results to those results reported in Table 4. Our results do not seem to be driven by firm/year observations with no change the firm's performance ranking. Second, we drop all observations that experience an increase or a decrease in the performance ranking of more than one quintile. In other words, we delete all firm/year observations in which the absolute value of the difference between the initial ranking and realized ranking quintiles is greater than one. The untabulated results suggest that our results are qualitatively similar to those in Table 4. Our results do not appear to be driven by firm/year observations with extreme changes in the firm's performance ranking. Third, we assess whether small firms are driving our results. We eliminate all observations with stock price less than $3 or total assets less than $5 million and find that the results are qualitatively similar. Based on the above, it does not appear that firm/year with little economic significance are driving our results.

## 7. Conclusion

In this study, we predict and find evidence that investors positively value improvements in the firm's performance ranking within the industry. We measure the change in the firm's performance ranking within the industry by considering how a realized ranking based on the released EPS figure at the earnings announcement date is different from an initially expected ranking based on expected earnings immediately prior to the earnings announcement. Using this measure, we specifically find that the buy-and-hold market-adjusted abnormal returns surrounding the earnings announcement are positively associated with the change in the firm's performance ranking after controlling the earnings surprise and other control variables. We also predict and find that if the firm has a history of stable (volatile) performance ranking changes, the market response to the change in the firm's performance ranking is stronger (weaker). Finally, we predict and find evidence consistent with managers opportunistically excluding expenses from non-GAAP earnings to influence the investors' perception regarding the firm's performance ranking. However, it appears that investors price protect themselves by discounting the change in the firm's performance ranking that is associated with income-increasing unexpected exclusions.

This study provides empirical evidence that earnings realizations convey useful information to investors regarding the firm's ability to compete within the industry. The prior research has examined the information conveyed at specific points in the earnings distribution, such as around analyst expectations, zero net income, and increases in earnings relative to the prior fiscal period. We attempt to provide evidence that investors use the entire distribution of earnings within the industry to assess the firm's performance. We also believe that the evidence in this paper provides one explanation for why firms might engage in earnings management activities even when they are comfortably above or below traditional benchmarks.

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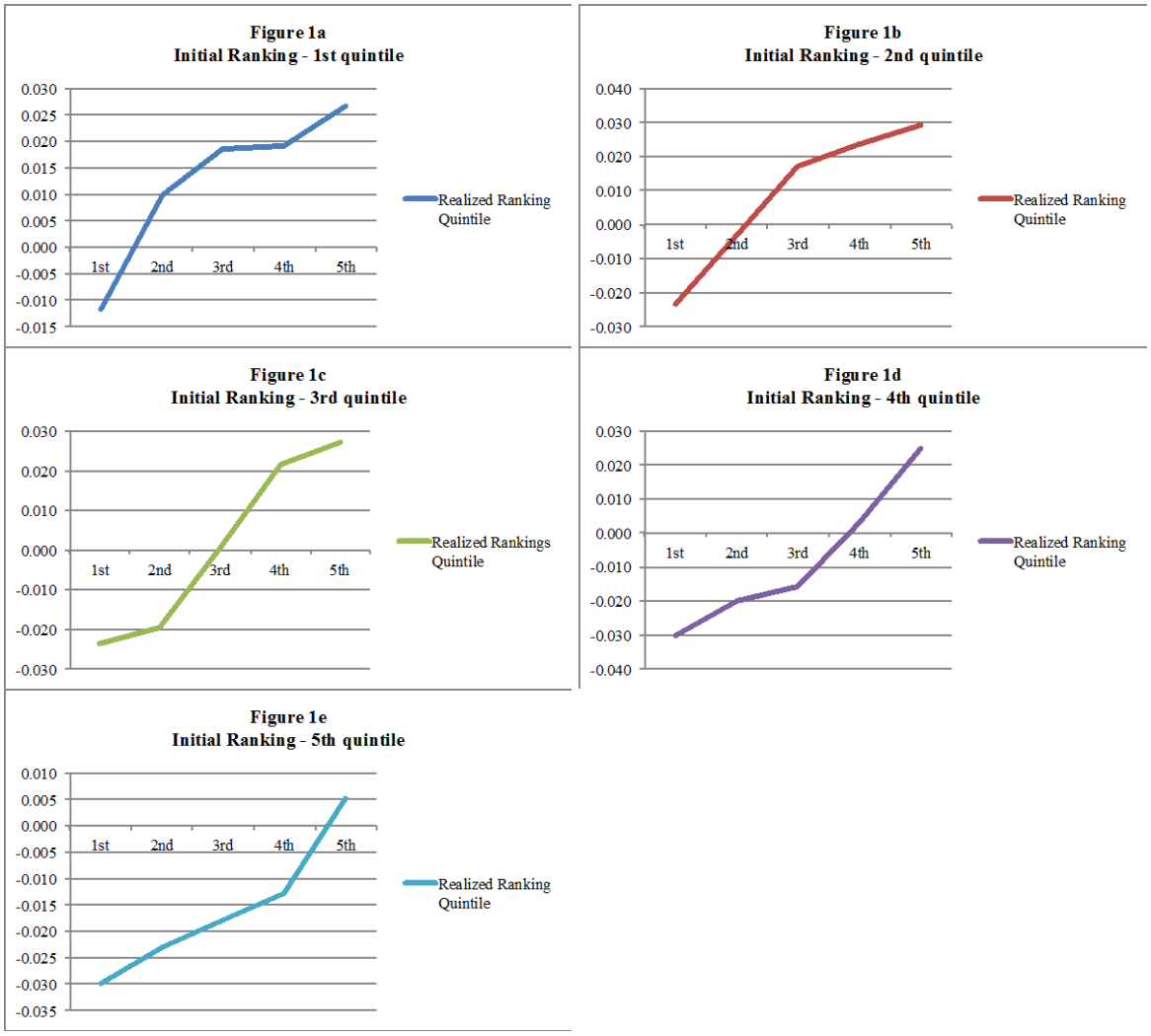
**Appendix A. Variable Definitions**

| Variables | Descriptions |
|---|---|
| $3DayRet_{i,t}$ | $3DayRet_{i,t}$ is firm *i*'s three-day buy-and-hold stock returns centered on the earnings announcement in quarter *t* less three-day value-weighted CRSP market returns over the same window. |
| $\Delta Ranking_{i,t}$ | $\Delta Ranking_{i,t}$ is measured by firm *i*'s realized ranking at the earnings announcement in quarter *t* less firm *i*'s initial ranking two days prior to the earnings announcement in quarter *t*, divided by the number of firms in the same industry. Realized (Initial) ranking is equal to firm *i*'s performance ranking within 6-digit GICS industry based on firms' realized (expected) earnings plus interest expenses multiplied by one minus marginal tax rates, divided by average total assets. Marginal tax rate is assumed as the top statutory federal tax rate plus 2% average state tax rate (Nissim and Penman, 2003). Realized (expected) earnings are measured by IBES-reported Actual EPS (either the consensus IBES median analyst forecast or IBES-reported Actual EPS in quarter *t-4* if the consensus IBES median forecast is missing) multiplied by the number of shares outstanding. If industry peer firms have already announced earnings, peer firms' announced earnings are used to determine firm *i*'s realized and initial rankings; otherwise peer firms' expected earnings are used. |
| $Initial\ Ranking_{i,t}$ | $Initial\ Ranking_{i,t}$ is firm *i*'s initial ranking in the industry in quarter *t* and it is described above. |
| $Realized\ Ranking_{i,t}$ | $Realized\ Ranking_{i,t}$ is firm *i*'s realized ranking in the industry in quarter *t* and it is described above. |
| $STD\_\Delta Ranking_{i,t}$ | $STD\_\Delta Ranking_{i,t}$ is measured by the standard deviation of the $\Delta Ranking_{i,t}$ variable using past 16 quarters observations (a minimum of 8 quarters observations is required). This variable is converted to range between 0 and 1. |
| $\ln(NUMEST_{i,t})$ | $\ln(NUMEST_{i,t})$ is equal to the natural logarithm of the number of analysts following firm *i* in quarter *t*. |
| $Surprise_{i,t}$ | $Surprise_{i,t}$ is firm *i*'s earnings surprise in quarter *t* as measured by firm *i*'s IBES-reported Actual EPS (IBES item *VALUE*) less expected earnings. Expected earnings are measure by either the consensus median EPS forecast in quarter *t* or firm *i*'s IBES-reported Actual EPS in quarter *t-4* if the consensus median EPS forecast is missing. If the dependent variable in the regression equation is stock returns, the earnings surprise is scaled by price (Compustat item *prccq*). The median EPS consensus are calculated based on individual analyst forecasts, which are required to be reported within a 90-day window |

| | |
|---|---|
| | preceding the daily date to ensure that our analyst consensus is not based on stale forecasts. We exclude individual analyst forecasts if I/B/E/S excludes the forecasts from calculating IBES-reported median EPS consensus. If the daily median EPS consensus analyst forecast is missing, we supplement our data by using IBES-reported median EPS consensus forecasts (i.e., IBES item MEDEST) |
| $MBE_{i,t}$ | $MBE_{i,t}$ is an indicator variable equal to one if the $Surprise_{i,t}$ variable is positive; zero otherwise |
| $ln(SIZE_{i,t})$ | $\ln(Size_{i,t})$ is equal to the natural logarithm of firm *i*'s market value of equity at the end of quarter *t* (Compustat item *prccq* multiplied by Compustat item *cshoq*). |
| $Book\text{-}to\text{-}Market_{i,t}$ | $Book\text{-}to\text{-}Market_{i,t}$ is measured by firm *i*'s book value of equity (Compustat item *seqq*) divided by the market value of equity at the end of quarter *t*. |
| $SalesGrowth_{i,t}$ | $SalesGrowth_{i,t}$ is equal to firm *i*'s net sales in quarter *t* (Compustat item *saleq*) divided by net sales in quarter *t-4*. |
| $Accruals_{i,t}$ | *Accruals* is measured as firm *i*'s GAAP EPS (Compustat item *epspxq*) less cash flows from operation per share in quarter *t* (Compustat item *oancfy* divided by Compustat item *cshprq*) divided by price at the end of quarter *t-1* (Compustat item *prccq*). |
| $Profitable_{i,t}$ | $Profitable_{i,t}$ is an indicator variable equal to one if firm *i*'s IBES-reported Actual EPS in quarter *t* is positive; zero, otherwise. |
| $HHI_{j,t}$ | $HHI_{j,t}$ is Herfindahl-Hirschman Index measured as the sum of squared market shares of all firms in an industry during quarter *t*. |
| $\Delta Industry\text{-}Adjusted\ ROA_{i,t}$ | $\Delta Industry\text{-}Adjusted\ ROA_{i,t}$ is calculated as firm *i*'s industry-adjusted return on assets in quarter *t* less firm *i*'s industry-adjusted return on assets in quarter *t-4*. Return on assets of firm *i* in quarter *t* is measured by firm *i*'s IBES-reported Actual EPS in quarter *t* multiplied by the number of shares plus interest expenses (Compustat item *xintq*) multiplied by one minus marginal tax rates, divided by average total assets (Compustat item *atq*). Marginal tax rate is assumed as the top statutory federal tax rate plus 2% average state tax rate (Nissim and Penman, 2003). To calculate industry adjusted return on assets, the median return on assets of the industry in quarter *t* is subtracted from firm *i*'s return on assets in quarter *t*. |
| $Pos\ Special\ Items\ Use_{i,t}$ | $Pos\ Special\ Items\ Use_{i,t}$ is an indicator variable equal to one if special items are positive; zero otherwise. Special items are defined as firm *i*'s operating income per share (Compustat item *opepsq*) less GAAP EPS before extraordinary items in quarter *t*. |

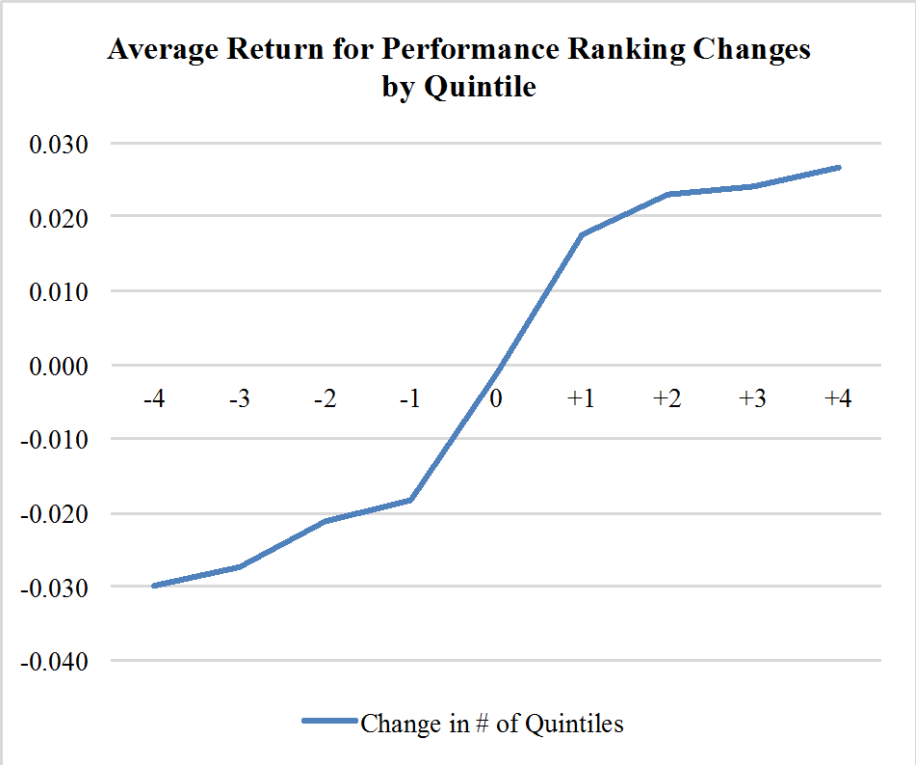
| | |
|---|---|
| *Pos Other Excl Use*$_{i,t}$ | *Pos Other Excl Use*$_{i,t}$ is an indicator variable equal to one if other exclusions are positive; zero otherwise. Other exclusions are defined as exclusions less special items. Exclusions are defined as firm *i*'s IBES-reported Actual EPS less GAAP EPS before extraordinary items in quarter *t* (Compustat item *epspxq* or *epsfxq* depending on IBES basic/diluted flag). |

**Figure 1. Performance ranking changes and abnormal stock returns**




The figures above represent the average return for each realized return quintile within each initial ranking quintile.

**Figure 2. Average Return for Performance Ranking Changes by Quintile**




The figure above represents the average return for firms that experience increases and decreases from the initial ranking to the realized ranking quintile. The "-4", "-3", "-2", and "-1" categories represent the average return for all firms that have a decrease of 4, 3, 2, and 1 quintiles from the initial ranking to realized ranking quintiles. The "0" category represents the average return for all firms that experience not change from the initial ranking to realized ranking quintile. The "1", "2", "3", and "4" categories represents the average return for all firms that have an increase of 1, 2, 3, and 4 quintiles from the initial ranking to realized ranking quintiles.

**Table 1 Descriptive statistics**

| | N | Mean | Std | P25 | Median | P75 |
|---|---|---|---|---|---|---|
| $3DayRet_{i,t}$ | 203,056 | 0.001 | 0.087 | -0.040 | -0.001 | 0.040 |
| $Initial\ Ranking_{i,t}$ | 203,056 | 0.515 | 0.279 | 0.280 | 0.517 | 0.753 |
| $Realized\ Ranking_{i,t}$ | 203,056 | 0.519 | 0.288 | 0.269 | 0.526 | 0.771 |
| $\Delta Ranking_{i,t}$ | 203,056 | 0.004 | 0.159 | -0.024 | 0.000 | 0.042 |
| $STD\_\Delta Ranking_{i,t}$ | 203,056 | 0.115 | 0.098 | 0.045 | 0.085 | 0.156 |
| $NUMEST_{i,t}$ | 203,056 | 5.787 | 6.143 | 1.000 | 4.000 | 8.000 |
| $Surprise_{i,t}$ | 203,056 | -0.004 | 0.195 | -0.030 | 0.010 | 0.047 |
| $MBE_{i,t}$ | 203,056 | 0.640 | 0.480 | 0.000 | 1.000 | 1.000 |
| $ln(SIZE_{i,t})$ | 203,056 | 6.180 | 1.991 | 4.755 | 6.138 | 7.512 |
| $Book\text{-}to\text{-}Market_{i,t}$ | 203,056 | 0.668 | 0.632 | 0.296 | 0.519 | 0.841 |
| $Sales\ Growth_{i,t}$ | 203,056 | 1.148 | 0.453 | 0.956 | 1.076 | 1.227 |
| $Accruals_{i,t}$ | 203,056 | -0.058 | 0.182 | -0.082 | -0.029 | 0.001 |
| $Profitable_{i,t}$ | 203,056 | 0.747 | 0.435 | 0.000 | 1.000 | 1.000 |
| $\Delta Industry\text{-}adjusted\ ROA_{i,t}$ | 203,056 | -0.001 | 0.031 | -0.006 | 0.000 | 0.005 |
| $HHI_{j,t}$ | 203,056 | 0.073 | 0.057 | 0.040 | 0.056 | 0.089 |

This table reports descriptive statistics for all sample firms with available information. The sample period ranges from 1997 to 2013. All variables are defined in Appendix A and all continuous variables are winsorized at the 1 and 99th percentiles.

**Table 2 Correlations**

| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | $3DayRet_{i,t}$ | | **0.03** | **0.13** | **0.20** | **-0.02** | **0.01** | **0.17** | **0.22** | **0.01** | **0.02** | **0.06** | **0.01** | **0.13** | **0.12** | 0.00 |
| (2) | $Initial\ Ranking_{i,t}$ | **0.04** | | **0.84** | **-0.22** | **-0.15** | **0.23** | **-0.01** | **0.07** | **0.34** | **-0.28** | **0.06** | **0.06** | **0.49** | **0.05** | **0.01** |
| (3) | $Realized\ Ranking_{i,t}$ | **0.14** | **0.85** | | **0.34** | **-0.16** | **0.24** | **0.33** | **0.35** | **0.35** | **-0.30** | **0.12** | **0.11** | **0.61** | **0.27** | **0.01** |
| (4) | $\Delta Ranking_{i,t}$ | **0.26** | **-0.11** | **0.31** | | **-0.03** | **0.03** | **0.61** | **0.51** | **0.04** | **-0.06** | **0.12** | **0.09** | **0.25** | **0.40** | 0.00 |
| (5) | $STD\_\Delta Ranking_{i,t}$ | **-0.03** | **-0.18** | **-0.18** | **-0.01** | | **-0.41** | **-0.05** | **-0.13** | **-0.44** | **0.11** | **0.01** | **-0.01** | **-0.18** | **-0.02** | **0.02** |
| (6) | $NUMEST_{i,t}$ | **0.03** | **0.25** | **0.26** | **0.04** | **-0.51** | | **0.07** | **0.15** | **0.70** | **-0.20** | **0.03** | 0.00 | **0.23** | **0.01** | **0.01** |
| (7) | $Surprise_{i,t}$ | **0.27** | **0.00** | **0.35** | **0.83** | **-0.06** | **0.09** | | **0.53** | **0.10** | **-0.12** | **0.11** | **0.18** | **0.29** | **0.38** | 0.00 |
| (8) | $MBE_{i,t}$ | **0.24** | **0.07** | **0.35** | **0.73** | **-0.15** | **0.17** | **0.83** | | **0.16** | **-0.13** | **0.11** | **0.09** | **0.29** | **0.27** | 0.00 |
| (9) | $ln(SIZE_{i,t})$ | **0.03** | **0.34** | **0.35** | **0.05** | **-0.45** | **0.75** | **0.13** | **0.17** | | **-0.36** | **0.06** | **0.06** | **0.38** | **0.06** | **-0.03** |
| (10) | $Book\text{-}to\text{-}Market_{i,t}$ | **0.01** | **-0.31** | **-0.32** | **-0.04** | **0.17** | **-0.25** | **-0.08** | **-0.13** | **-0.33** | | **-0.16** | **-0.27** | **-0.16** | **-0.05** | 0.00 |
| (11) | $SalesGrowth_{i,t}$ | **0.10** | **0.16** | **0.24** | **0.16** | **-0.06** | **0.10** | **0.18** | **0.19** | **0.14** | **-0.23** | | **0.10** | **0.07** | **0.25** | **-0.02** |
| (12) | $Accruals_{i,t}$ | **-0.01** | **-0.01** | **0.03** | **0.06** | **0.01** | -0.06 | **0.06** | **0.06** | **-0.06** | **-0.22** | **0.12** | | **0.06** | **0.08** | **0.02** |
| (13) | $Profitable_{i,t}$ | **0.14** | **0.49** | **0.60** | **0.25** | **-0.17** | **0.26** | **0.29** | **0.29** | **0.39** | **-0.06** | **0.21** | **-0.08** | | **0.21** | **-0.02** |
| (14) | $\Delta Industry\text{-}adjusted\ ROA_{i,t}$ | **0.16** | **0.09** | **0.31** | **0.42** | **0.01** | 0.00 | **0.44** | **0.37** | **0.06** | **-0.09** | **0.28** | **0.05** | **0.23** | | 0.00 |
| (15) | $HHI_{i,t}$ | **-0.01** | **0.01** | **0.01** | **0.01** | **0.01** | **0.06** | **0.02** | **0.01** | **-0.02** | -0.06 | **-0.03** | **0.08** | **-0.07** | -0.01 | |

This table presents Pearson (Above) / Spearman (Below) correlations. Correlations that are significant at 1% level are bolded. The sample period ranges from 1997 to 2013. All variables are defined in Appendix A and all continuous variables are winsorized at the 1 and 99th percentiles.

**Table 3 Univariate analysis**

**Panel A Transition Matrix**

| | Realized Rankings | | | | | |
|---|---|---|---|---|---|---|
| Initial Rankings | 1st | 2nd | 3rd | 4th | 5th | Sum |
| 1st | **30,595** | 6,970 | 1,320 | 800 | 975 | 40,660 |
| | **(0.75)** | (0.17) | (0.03) | (0.02) | (0.02) | |
| 2nd | 5,909 | **25,840** | 6,665 | 1,407 | 730 | 40,551 |
| | (0.15) | **(0.64)** | (0.16) | (0.03) | (0.02) | |
| 3rd | 1,879 | 5,611 | **25,940** | 6,010 | 1,162 | 40,602 |
| | (0.05) | (0.14) | **(0.64)** | (0.15) | (0.03) | |
| 4th | 1,093 | 1,565 | 5,644 | **27,692** | 4,718 | 40,712 |
| | (0.03) | (0.04) | (0.14) | **(0.68)** | (0.12) | |
| 5th | 1,074 | 666 | 1,064 | 4,711 | **33,016** | 40,531 |
| | (0.03) | (0.02) | (0.03) | (0.12) | **(0.81)** | |
| Sum | 40,550 | 40,652 | 40,633 | 40,620 | 40,601 | 203,056 |

**Panel B Market Reactions**

| | Realized Rankings | | | | |
|---|---|---|---|---|---|
| Initial Rankings | 1st | 2nd | 3rd | 4th | 5th |
| 1st | **-0.012** | **0.010** | **0.018** | **0.019** | **0.027** |
| 2nd | **-0.023** | **-0.003** | **0.017** | **0.023** | **0.029** |
| 3rd | **-0.024** | **-0.020** | **0.001** | **0.022** | **0.027** |
| 4th | **-0.030** | **-0.020** | **-0.016** | **0.003** | **0.025** |
| 5th | **-0.030** | **-0.023** | **-0.018** | **-0.013** | **0.005** |

This table presents the transition matrix and corresponding market responses based on the initial and realized rankings of the firm. In Panel A, the first column denotes the initial ranking quintiles, calculated two days prior to the announcement of earnings, and the first row denotes the realized ranking quintiles of the firm at the earnings announcement date. Transition likelihoods are presented in parentheses and the diagonal is bolded. Panel B presents market responses corresponding to the transitions in Panel A. Significance level at 1 % is bolded in Panel B.

**Table 4 Investor response to the effect of the change in the performance ranking**

| | $3DayRet_{i,t}$ | | | | |
|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (4) | (5) |
| | | | | | Decile-Ranked |
| **$\Delta Ranking_{i,t}$** | **0.107*** ** | | **0.094*** ** | **0.102*** ** | **0.033*** ** |
| | **(31.933)** | | **(26.027)** | **(27.688)** | **(21.510)** |
| $Surprise_{i,t}$ | | 0.274*** | 0.093*** | 0.083*** | 0.038*** |
| | | (19.616) | (9.173) | (7.700) | (17.029) |
| $STD\_\Delta Ranking_{i,t}$ | | | | -0.003*** | -0.004*** |
| | | | | (-3.371) | (-4.261) |
| $Initial\ Ranking_{i,t}$ | | | | 0.027*** | 0.015*** |
| | | | | (19.962) | (13.675) |
| $HHI_{j,t}$ | | | | -0.002 | -0.001 |
| | | | | (-0.452) | (-1.059) |
| $\Delta Industry\text{-}adjusted\ ROA_{i,t}$ | | | | 0.054*** | 0.009*** |
| | | | | (4.730) | (10.595) |
| $Sales\ Growth_{i,t}$ | | | | 0.006*** | 0.013*** |
| | | | | (8.062) | (12.478) |
| $Book\text{-}to\text{-}Market_{i,t}$ | | | | 0.008*** | 0.015*** |
| | | | | (10.728) | (9.671) |
| $\ln(Size_{i,t})$ | | | | -0.001*** | -0.006*** |
| | | | | (-3.831) | (-3.799) |
| $Accruals_{i,t}$ | | | | -0.003 | -0.006*** |
| | | | | (-1.343) | (-5.543) |
| *Constant* | 0.001 | 0.002*** | 0.001 | -0.018*** | -0.053*** |
| | (0.753) | (2.647) | (1.265) | (-7.604) | (-26.311) |
| Observations | 203,056 | 203,056 | 203,056 | 203,056 | 203,056 |
| Adjusted R-squared | 0.039 | 0.019 | 0.040 | 0.050 | 0.079 |
| Vuong test | | | | | |
| Column (1) $3DayRet_{i,t} = a + b\ \Delta Ranking_{i,t} + \varepsilon_{i,t}$ | | | | *Z-Stat* | *P-value* |
| Column (2) $3DayRet_{i,t} = a + b\ Surprise_{i,t} + \varepsilon_{i,t}$ | | | | 21.312 | 0.000 |

This table presents estimation results from the regression of three-day buy-and-hold abnormal returns surrounding earnings announcement ($3DayRet_{i,t}$) on the firm's performance ranking changes ($\Delta Ranking_{i,t}$), and control variables. In column (5), all variables are decile-ranked. All variables are defined in the Appendix and all continuous variables are winsorized at the 1 and 99th percentiles. Standard errors are clustered by quarter and firm. *, **, and *** represent significance level at the 10%, 5%, and 1%, respectively.

**Table 5 The effect of the volatility of past changes in the firm's performance ranking**

| | $3DayRet_{i,t}$ | |
|---|---|---|
| Variables | (1) | (2) |
| | | Decile-Ranked |
| $\Delta$***Ranking*$_{i,t}$** | **0.229*** ** | **0.052*** ** |
| | **(26.042)** | **(21.102)** |
| $STD\_\Delta Ranking_{i,t}$ | -0.003*** | 0.012*** |
| | (-3.116) | (6.064) |
| $\Delta$***Ranking*$_{i,t}$ × ***STD***$\_\Delta$***Ranking*$_{i,t}$** | **-0.167*** ** | **-0.034*** ** |
| | **(-18.439)** | **(-10.026)** |
| $Surprise_{i,t}$ | 0.085*** | 0.040*** |
| | (7.683) | (17.704) |
| $Initial\ Ranking_{i,t}$ | 0.027*** | 0.014*** |
| | (20.042) | (13.237) |
| $HHI_{j,t}$ | -0.003 | -0.001 |
| | (-0.655) | (-1.169) |
| $\Delta Industry\text{-}adjusted\ ROA_{i,t}$ | 0.060*** | 0.010*** |
| | (5.212) | (11.503) |
| $Sales\ Growth_{i,t}$ | 0.006*** | 0.014*** |
| | (8.222) | (12.725) |
| $Book\text{-}to\text{-}Market_{i,t}$ | 0.008*** | 0.015*** |
| | (10.887) | (9.634) |
| $\ln(Size_{i,t})$ | -0.001*** | -0.006*** |
| | (-3.842) | (-3.846) |
| $Accruals_{i,t}$ | -0.004* | -0.006*** |
| | (-1.694) | (-5.545) |
| *Constant* | -0.019*** | -0.062*** |
| | (-7.652) | (-25.983) |
| *Coefficient test* | | |
| $\Delta Ranking_{i,t} + \Delta Ranking_{i,t} \times STD\_\Delta Ranking_{i,t}$ | 0.062 | 0.018 |
| F-Statistics | 349.3 | 66.18 |
| P-Value | 0.00 | 0.00 |
| Observations | 203,056 | 203,056 |
| Adjusted R-squared | 0.055 | 0.080 |

This table presents estimation results from the regression of three-day buy-and-hold abnormal returns surrounding the earnings announcement ($3DayRet_{i,t}$) on the firm's performance ranking changes ($\Delta Ranking_{i,t}$), and control variables. To examine the effect of the volatility of past ranking changes on the association between stock returns and ranking changes, we interact the $\Delta Ranking_{i,t}$ variable with the $STD\_\Delta Ranking_{i,t}$ variable, which ranges between zero and one. All variables in the second column are decile-ranked. All variables are defined in the Appendix and all continuous variables are winsorized at the 1 and 99th percentiles. Standard errors are clustered by quarter and firm. *, **, and *** represent significance level at the 10%, 5%, and 1%, respectively.

**Table 6 The effects of the use of positive exclusions on the change in the performance ranking**

| Variables | $\Delta Ranking_{i,t}$ (1) |
|---|---|
| ***Pos Other Excl Use$_{i,t}$*** | **0.013*** ** |
| | **(13.318)** |
| ***Pos Special Items Use$_{i,t}$*** | **0.005*** ** |
| | **(4.434)** |
| *Book-to-Market$_{i,t}$* | -0.019*** |
| | (-13.006) |
| *Sales Growth$_{i,t}$* | 0.005*** |
| | (3.668) |
| ln(*Size$_{i,t}$*) | -0.003*** |
| | (-4.936) |
| $\Delta$*Industry-adjusted ROA$_{i,t}$* | 1.257*** |
| | (32.356) |
| *Profitable$_{i,t}$* | 0.106*** |
| | (28.204) |
| *MBE$_{i,t}$* | 0.125*** |
| | (78.386) |
| ln(*NUMEST$_{i,t}$*) | -0.001 |
| | (-0.791) |
| *HHI$_{j,t}$* | 0.025*** |
| | (2.814) |
| *STD_$\Delta$Ranking$_{i,t}$* | 0.008*** |
| | (3.398) |
| *Initial Ranking$_{i,t}$* | -0.234*** |
| | (-29.257) |
| *Constant* | -0.020*** |
| | (-3.946) |
| <u>*Coefficient Difference*</u> | |
| *Pos Other Excl Use$_{i,t}$ – Pos Special Items Use$_{i,t}$* | 0.008 |
| F-Statistics | 37.09 |
| P-Value | 0.00 |
| Observations | 203,056 |
| Adjusted R-squared | 0.464 |

This table presents estimation results from the regression of the change in the firm's performance ranking ($\Delta Ranking_{i,t}$) on the use of positive other exclusions (*Pos Other Excl Use$_{i,t}$*), the use of positive special items (*Pos Special Items Use$_{i,t}$*), and control variables. All variables are defined in the Appendix and all continuous variables are winsorized at the 1 and 99th percentiles. Standard errors are clustered by quarter and firm. *, **, and *** represent significance level at the 10%, 5%, and 1%, respectively.

**Table 7 Investor response to the use of positive exclusions**

| Variables | $3DayRet_{i,t}$ (1) |
|---|---|
| $\Delta$ $Ranking_{i,t}$ | 0.099*** |
| | (30.541) |
| $Pos\ Other\ Excl\ Use_{i,t}$ | -0.007*** |
| | (-8.837) |
| **$\Delta$ $Ranking_{i,t}$ × $Pos\ Other\ Excl\ Use_{i,t}$** | **-0.012**** |
| | **(-2.260)** |
| $Pos\ Special\ Items\ Use_{i,t}$ | 0.002*** |
| | (3.998) |
| $\Delta$ $Ranking_{i,t}$ × $Pos\ Special\ Items\ Use_{i,t}$ | 0.019*** |
| | (3.718) |
| $Surprise_{i,t}$ | 0.085*** |
| | (7.794) |
| $STD\_\Delta Ranking_{i,t}$ | -0.003*** |
| | (-3.338) |
| $Initial\ Rankings_{i,t}$ | 0.026*** |
| | (18.918) |
| $HHI_{j,t}$ | -0.001 |
| | (-0.342) |
| $\Delta Industry\text{-}adjusted\ ROA_{i,t}$ | 0.059*** |
| | (5.055) |
| $Book\text{-}to\text{-}Market_{i,t}$ | 0.008*** |
| | (10.896) |
| ln($Size_{i,t}$) | -0.001*** |
| | (-3.462) |
| $Sales\ Growth_{i,t}$ | 0.006*** |
| | (7.534) |
| $Accruals_{i,t}$ | -0.004* |
| | (-1.740) |
| *Constant* | -0.017*** |
| | (-7.117) |
| *Coefficient test* | |
| $\Delta Ranking_{i,t}$ + $\Delta Ranking_{i,t}$ × $Pos\ Other\ Excl\ Use_{i,t}$ | 0.087 |
| F-Statistics | 198.53 |
| P-Value | 0.000 |
| Observations | 203,056 |
| Adjusted R-squared | 0.052 |

This table presents estimation results from the regression of three-day buy-and-hold abnormal returns surrounding the earnings announcement ($3DayRet_{i,t}$) on the change in the firm's performance ranking ($\Delta Ranking_{i,t}$), the use of positive exclusions ($Pos\ Other\ Excl\ Use_{i,t}$ and $Pos\ Special\ Items\ Use_{i,t}$), the interactions of the $\Delta Ranking_{i,t}$ variable with the use of positive exclusions variables, and control variables. All variables are defined in the Appendix and all continuous variables are winsorized at the 1 and 99th percentiles. Standard errors are clustered by quarter and firm. *, **, and *** represent significance level at the 10%, 5%, and 1%, respectively.

**Table 8 Persistence of return on assets**

**Panel A Results based on realized performance rankings**

| Variables | $ROA_{t+4}$ (1) | $ROA_{t+4}$ (2) | $ROA_{t+4}$ (3) | $ROA_{t+8}$ (4) | $ROA_{t+12}$ (5) |
|---|---|---|---|---|---|
| $ROA_{i,t}$ | 0.708*** | 0.683*** | 0.718*** | 0.622*** | 0.546*** |
| | (63.785) | (48.095) | (56.874) | (36.012) | (28.434) |
| $D\_Realized\ Ranking_{i,t}$ | | -0.003*** | -0.005*** | -0.007*** | -0.008*** |
| | | (-3.587) | (-3.805) | (-5.152) | (-5.021) |
| **$ROA_{i,t} \times D\_Realized\ Ranking_{i,t}$** | | **0.139*** ** | **0.114*** ** | **0.109*** ** | **0.132*** ** |
| | | **(5.714)** | **(5.309)** | **(4.182)** | **(4.203)** |
| $Surprise_{i,t}$ | | | -0.008*** | -0.007*** | -0.007*** |
| | | | (-7.359) | (-6.801) | (-7.339) |
| $STD\_\Delta Ranking_{i,t}$ | | | -0.002*** | -0.003*** | -0.004*** |
| | | | (-2.714) | (-4.152) | (-4.796) |
| $Initial\ Ranking_{i,t}$ | | | 0.005*** | 0.005*** | 0.005*** |
| | | | (3.832) | (3.427) | (3.120) |
| $HHI_{j,t}$ | | | -0.005** | -0.006** | -0.009*** |
| | | | (-2.229) | (-2.312) | (-2.899) |
| $\Delta Industry\text{-}adjusted\ ROA_{i,t}$ | | | -0.179*** | -0.173*** | -0.161*** |
| | | | (-21.214) | (-18.038) | (-15.295) |
| $Sales\ Growth_{i,t}$ | | | -0.002*** | -0.004*** | -0.004*** |
| | | | (-4.681) | (-5.539) | (-5.492) |
| $Book\text{-}to\text{-}Market_{i,t}$ | | | -0.001* | 0.000 | 0.001** |
| | | | (-1.940) | (0.772) | (2.077) |
| $\ln(Size_{i,t})$ | | | 0.001*** | 0.002*** | 0.002*** |
| | | | (16.992) | (11.471) | (10.178) |
| $Accruals_{i,t}$ | | | -0.011*** | -0.012*** | -0.011*** |
| | | | (-9.900) | (-9.147) | (-9.517) |
| *Constant* | 0.001 | 0.001* | -0.006*** | -0.004** | -0.003 |
| | (1.543) | (1.663) | (-5.473) | (-2.172) | (-1.254) |
| Observations | 176,722 | 176,722 | 176,722 | 151,617 | 130,001 |
| Adjusted R-squared | 0.488 | 0.490 | 0.522 | 0.408 | 0.345 |

**Panel B Results based on the change in performance rakings**

| Variables | $ROA_{t+4}$ (1) | $ROA_{t+4}$ (2) | $ROA_{t+4}$ (3) | $ROA_{t+8}$ (4) | $ROA_{t+12}$ (5) |
|---|---|---|---|---|---|
| $ROA_{i,t}$ | 0.708*** | 0.626*** | 0.676*** | 0.600*** | 0.527*** |
| | (63.785) | (35.516) | (42.731) | (31.828) | (27.864) |
| $D\_\Delta\ Ranking_{i,t}$ | | -0.008*** | 0.001*** | 0.001 | 0.001 |
| | | (-14.830) | (2.638) | (0.936) | (0.892) |
| $\boldsymbol{ROA_{i,t} \times D\_\Delta\ Ranking_{i,t}}$ | | **0.236*** ** | **0.146*** ** | **0.098*** ** | **0.102*** ** |
| | | **(8.121)** | **(5.857)** | **(3.336)** | **(4.066)** |
| $Surprise_{i,t}$ | | | -0.011*** | -0.010*** | -0.010*** |
| | | | (-10.570) | (-10.521) | (-10.565) |
| $STD\_\Delta Ranking_{i,t}$ | | | -0.002*** | -0.004*** | -0.005*** |
| | | | (-4.224) | (-4.799) | (-5.484) |
| $Initial\ Ranking_{i,t}$ | | | 0.002*** | 0.001 | 0.001 |
| | | | (3.488) | (0.873) | (0.482) |
| $HHI_{j,t}$ | | | -0.005** | -0.006** | -0.009*** |
| | | | (-2.353) | (-2.390) | (-2.970) |
| $\Delta Industry\text{-}adjusted\ ROA_{i,t}$ | | | -0.176*** | -0.174*** | -0.163*** |
| | | | (-21.105) | (-18.717) | (-15.955) |
| $Sales\ Growth_{i,t}$ | | | -0.002*** | -0.003*** | -0.004*** |
| | | | (-4.670) | (-5.384) | (-5.309) |
| $Book\text{-}to\text{-}Market_{i,t}$ | | | -0.001** | 0.000 | 0.001 |
| | | | (-2.376) | (0.341) | (1.462) |
| $\ln(Size_{i,t})$ | | | 0.001*** | 0.001*** | 0.002*** |
| | | | (16.290) | (10.974) | (9.621) |
| $Accruals_{i,t}$ | | | -0.010*** | -0.011*** | -0.011*** |
| | | | (-9.721) | (-9.271) | (-9.465) |
| *Constant* | 0.001 | 0.004*** | -0.007*** | -0.004** | -0.003 |
| | (1.543) | (7.915) | (-5.562) | (-2.278) | (-1.327) |
| Observations | 176,722 | 176,722 | 176,722 | 151,617 | 130,001 |
| Adjusted R-squared | 0.488 | 0.495 | 0.523 | 0.407 | 0.345 |

This table presents estimation results from the regression of return on assets in quarter $t+\tau$ ($ROA_{i,t+\tau}$) on return on assets in quarter $t$ ($ROA_{i,t}$), either the decile-ranked realized ranking of the firm ($D\_Realized\ Ranking_{i,t}$) in Panel A or the change in the firm's performance ranking ($\Delta Ranking_{i,t}$) in Panel B, the interaction of those two variables, and control variables. In column (1), (2), and (3) the dependent variable is return on assets in quarter *t+4*. In column (4) and (5), return on assets at quarter *t+8* and *t+12* are used as the dependent variable, respectively. All variables are defined in the Appendix and all continuous variables are winsorized at the 1 and 99th percentiles. Standard errors are clustered by quarter and firm. *, **, and *** represent significance level at the 10%, 5%, and 1% respectively.

**Table 9 Robustness check: Industry-adjusted abnormal stock returns**

| | *Industry-Adjusted 3DayRet*$_{i,t}$ | | | | |
|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (4) | (5) |
| | | | | | Decile-Ranked |
| **$\Delta$*Ranking*$_{i,t}$** | **0.107*** ** | | **0.094*** ** | **0.101*** ** | **0.033*** ** |
| | **(32.085)** | | **(26.124)** | **(27.987)** | **(21.904)** |
| *Surprise*$_{i,t}$ | | 0.274*** | 0.093*** | 0.081*** | 0.037*** |
| | | (20.005) | (9.173) | (7.414) | (17.969) |
| *STD_*$\Delta$*Ranking*$_{i,t}$ | | | | -0.002* | -0.003*** |
| | | | | (-1.716) | (-2.734) |
| *Initial Ranking*$_{i,t}$ | | | | 0.025*** | 0.013*** |
| | | | | (18.943) | (12.512) |
| *HHI*$_{j,t}$ | | | | -0.000 | -0.001 |
| | | | | (-0.002) | (-1.017) |
| $\Delta$*Industry-adusted ROA*$_{i,t}$ | | | | 0.057*** | 0.009*** |
| | | | | (5.316) | (10.585) |
| *Sales Growth*$_{i,t}$ | | | | 0.006*** | 0.014*** |
| | | | | (9.356) | (18.110) |
| *Book-to-Market*$_{i,t}$ | | | | 0.007*** | 0.013*** |
| | | | | (11.763) | (10.859) |
| ln(*Size*$_{i,t}$) | | | | -0.001*** | -0.004*** |
| | | | | (-3.355) | (-3.057) |
| *Accruals*$_{i,t}$ | | | | -0.003 | -0.006*** |
| | | | | (-1.571) | (-6.207) |
| *Constant* | -0.001* | 0.001 | -0.000 | -0.021*** | -0.054*** |
| | (-1.923) | (1.643) | (-0.947) | (-11.107) | (-32.820) |
| Observations | 198,270 | 198,270 | 198,270 | 198,270 | 198,270 |
| Adjusted R-squared | 0.040 | 0.019 | 0.042 | 0.051 | 0.080 |

This table presents estimation results from the regression of three-day buy-and-hold abnormal industry-adjusted returns surrounding earnings announcement (*Industry-Adjusted 3DayRet*$_{i,t}$) on the firm's performance ranking changes ($\Delta$*Ranking*$_{i,t}$), and control variables. The *Industry-Adjusted 3DayRet*$_{i,t}$ variable is defined as the cumulated three days equal-weighted average stock returns of all firms in the same GICS industry as firm *i* at the earnings announcement date of firm *i* (excluding firm *i* in the industry) subtracted from three-days cumulative stock returns of firm *i*. In column (5), all variables are decile-ranked. All variables are defined in the Appendix and all continuous variables are winsorized at the 1 and 99th percentiles. Standard errors are clustered by quarter and firm. *, **, and *** represent significance level at the 10%, 5%, and 1%, respectively.