SMU SINGAPORE MANAGEMENT UNIVERSITY | School of Accountancy

Singapore Management University

School of Accountancy Research Paper Series Vol. 13, No. 1

(Paper No: 2025-192)

A rating system to evaluate non-GAAP exclusion quality

Patricia M. Dechow

Wei Ting Loh

Annika Yu Wang

Feb 2025

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Patricia M. Dechow
Marshall School of Business
University of Southern California
patricia.dechow@marshall.usc.edu

Wei Ting Loh
School of Accountancy
Singapore Management University
wtloh@smu.edu.sg

Annika Yu Wang
Bauer College of Business
University of Houston
annikawang@bauer.uh.edu

Abstract: We develop a rating system to evaluate the quality of individual non-GAAP exclusions. Our perspective is that high-quality exclusions reflect nonrecurring economic transactions, are transitory accounting adjustments, or have little usefulness in forecasting cash flows. We use four approaches to rate exclusions. We evaluate the serial correlation of the exclusion, survey accounting academics' views, obtain practitioner ratings from the CFA Institute, and identify the exclusions approved by the Chinese securities regulator. A firm's exclusion quality score is the weighted average rating of its individual exclusions. For our sample of S&P 500 firms, we document that exclusion quality varies by industry, captures trends in non-GAAP reporting, and is reasonably stable at the firm level. To validate the rating, we show that firms with lower exclusion quality scores receive more SEC comment letters, incur more Regulation G violations, exhibit greater analyst forecast dispersion, and have slower price discovery following earnings announcements.

Keywords: Non-GAAP Reporting; Non-GAAP Exclusion Quality; Recurring Expenses; Regulation G; SEC Comment Letters; Analyst Forecast Dispersion.

JEL Classification: G12, M41.

Data Availability: Data are publicly available from the sources identified in the text.

* We appreciate helpful comments and suggestions from an anonymous referee, Peter Demerjian, Weili Ge, Henry Laurion, Roby Lehavy, Russell Lundholm (editor), Sarah McVay, Suresh Radhakrishnan, Doug Skinner, Richard Sloan, Teri Yohn, and David Zion, as well as workshop and conference participants at the University of Texas at Dallas, the 2023 University of Michigan Harvey E. Kapnick Accounting Spring Conference, Strategic Global Advisors, the 2023 University of Brasilia Accounting and Governance Conference, and the Accounting Design Project Virtual Event. We thank Fangfei Shu for her research assistance. For our online survey of accounting academics' views of non-GAAP exclusions, we obtained clearance from the Institutional Review Boards of the University of Southern California, the University of Houston, and Singapore Management University.

A rating system to evaluate non-GAAP exclusion quality

1. Introduction

The objective of our research is to develop a rating system to evaluate the quality of non-GAAP exclusions. We believe that an easy-to-communicate measure of non-GAAP exclusion quality will help investors and other financial statement users for two reasons. First, the practice of reporting non-GAAP metrics has become increasingly prevalent in recent years. In 2003, 55% of S&P 500 firms reported non-GAAP earnings, whereas by 2020, close to 80% of firms did so. Therefore, users are very likely to encounter non-GAAP earnings metrics. Second, not only do more firms engage in non-GAAP reporting, but the variety and magnitude of exclusions have also increased. We document that the average number of exclusions per firm increased from 4.6 to 5.3 during our sample period. A parsimonious measure of exclusion quality can thus help investors and other financial statement users compare firms with different types of exclusions and better understand whether the exclusions are reasonable.

We use four approaches to evaluate the quality of exclusions, where we assign 1 to a low-quality exclusion and 5 to a high-quality one. First, we calculate the serial correlation of the exclusion and rank exclusions based on their serial correlation, the AR(1) coefficient, assigning 1 to highly persistent exclusions and 5 to highly transitory ones. Second, we survey over 100 accounting academics and have them rate a list of 22 exclusions from 1 to 5. Third, we obtain practitioner ratings of exclusions from the CFA Institute's (2016) survey of non-GAAP exclusions, where more than 65% of respondents are buy-side analysts and institutional investors, and assign a score of 1 to 5 based on the survey's findings. Finally, we identify the appropriate exclusions that the China Securities Regulatory Commission (CSRC) approves and assign a rating of 4.5 to them.[1] We find that, for many exclusions, the rating of quality is consistent across

[1] The non-GAAP reporting guideline issued by the CSRC represents a regulator's view of appropriate non-GAAP exclusions. We use this as it is the only explicit guideline on non-GAAP exclusions issued by a regulatory body. In particular, the SEC questions specific firms' exclusions of certain expenses but it does not explicitly identify any inappropriate non-GAAP exclusion for all firms.

the four approaches. Where this is not the case, we use our conceptual framework of exclusion quality to guide our final rating.

Our conceptual framework for evaluating the quality of exclusions takes the perspective that investors desire an earnings metric that is useful for understanding current firm performance as well as for predicting future performance. Therefore, an exclusion can be viewed as higher quality if it reflects an economic transaction or cash outflow that is unlikely to recur, is an accounting adjustment that is a one-off correction of the balance sheet or induces transitory components in earnings, or is an economic event already reflected in price and thus irrelevant for forecasting cash flows. The outcome of this process is a rating of each exclusion from 1 to 5, representing exclusion quality from *Low*, *Medium Low*, *Neutral*, *Medium High*, to *High*.

Our sample consists of annual non-GAAP earnings reported by S&P 500 firms between 2013 and 2017. We identify 22 unique non-GAAP exclusions from Audit Analytics and manually verify a random sample of these exclusions against firms' Form 8-K filings. We group all remaining unidentifiable exclusions into an item labeled as *Others (unidentified)*. Our next step is to assign a score to each firm-year in our sample. Firms can report multiple non-GAAP earnings metrics, and so for each firm-year, we identify the individual exclusions and the dollar magnitude of the exclusions using the firms' most aggressive non-GAAP earnings metric (i.e., the metric that has the most exclusions) reported during the year. We find that, for 47% of firms, their most aggressive non-GAAP earnings metric is an adjusted EPS number, for 30% it is an adjusted operating income number, for 3% it is an adjusted EBIT number (earnings before interest and taxes), and for 19% it is EBITDA (earnings before interest, taxes, depreciation, and amortization). We then calculate a weighted average non-GAAP exclusion quality score, where the weight is based on the magnitude of the exclusion relative to the absolute total non-GAAP exclusions of the firm during the year.

For our sample firms, the median magnitude of total exclusions is large, accounting for approximately 39% of GAAP earnings. The average firm receives an exclusion quality score of 2.7 (between *Medium Low* and *Neutral*) with an interquartile range from 1.9 to 3.6. We find that over 43% of

firms stay in the same exclusion quality score category for two consecutive years. This evidence suggests that a significant proportion of firms adopt consistent non-GAAP reporting practices year over year, which is consistent with prior research (Black et al. 2021). Grouping firms by industry, we find that firms within the same industry tend to report a certain non-GAAP metric more than other metrics and have similar non-GAAP exclusion scores, consistent with companies seeking to make their non-GAAP reporting comparable to industry peers. We find that, on average, firms exclude five items from their non-GAAP earnings and are having more low-quality exclusions. We examine the firm characteristics associated with non-GAAP exclusion quality. Our evidence suggests that firms reporting lower-quality non-GAAP earnings face greater stock market pressure to show strong operating performance. Specifically, firms with low exclusion quality tend to be younger, exhibit higher sales growth, and have stronger past stock price performance and greater institutional holdings.

The top four exclusions in our sample are *Depreciation and Amortization*, *Net Interest Expense*, *Stock Compensation Expense,* and *Impairment on PPE and Intangible Assets*, the first three of which are classified as low quality. We document that these four exclusions are common, conditional on the firm reporting the item in GAAP earnings. For example, of all sample firms that report *Depreciation and Amortization*, 46% exclude it from non-GAAP earnings metrics. Likewise, 30% of sample firms that report net interest expense exclude it from their non-GAAP metrics. This evidence suggests that non-GAAP exclusions frequently involve recurring expenses, even though non-GAAP earnings are often claimed to inform about core business performance.

We employ three tests to validate that our non-GAAP exclusion quality score captures firms with low-quality exclusions. The first test focuses on the perceptions of regulators. We predict that firms with low exclusion quality are more likely to face regulatory scrutiny. We show that low-exclusion quality firms are more likely to receive subsequent SEC comment letters and citations for Regulation G violations against their current year's non-GAAP earnings.

The second test focuses on the perceptions of financial analysts. When managers make non-GAAP exclusion choices that are more arbitrary or less appropriate from analysts' point of view, analysts are likely to have more divergent opinions about which non-GAAP adjustments they should exclude from or include in their forecasts. We document that analysts' EPS forecast dispersion is higher for firms with lower exclusion quality, consistent with this sort of disagreement among analysts.

The third test focuses on the perceptions of investors. We expect that investors will have more difficulty interpreting and processing the earnings surprise (i.e., actual non-GAAP EPS minus non-GAAP EPS forecast) for firms with lower exclusion quality. This will occur because it will be harder for investors to know which earnings number is appropriate when determining whether the firm met or missed expectations. We document that a lower non-GAAP exclusion quality score is associated with slower price discovery over the five and ten trading days following the earnings release. This result holds after controlling for the magnitude of earnings surprises, the lag between the fiscal year-end and the earnings release, management guidance, and price per share.

We find that the magnitude of total exclusions does not appear to influence regulatory outcomes or explain analyst forecast dispersion, consistent with sophisticated users of financial information paying more attention to the quality of non-GAAP exclusions rather than their relative magnitude. We do, however, find that the magnitude of total non-GAAP exclusions slows the assimilation of earnings news into price, suggesting that both the quality and magnitude of exclusions impact investors' ability to assimilate earnings news.

We examine the sensitivity of our results to our research design choice of using the most aggressive definition of non-GAAP earnings (i.e., EBITDA) when determining non-GAAP exclusion quality. In our sample, 18.7% of firms report more than one non-GAAP earnings metric when they report EBITDA. The remaining 81.3% report a single non-GAAP metric. In additional analyses, we measure non-GAAP exclusion quality based on a firm's least aggressive non-GAAP metric, and our results continue to hold.

Our study makes four contributions to the literature. To our knowledge, ours is the first paper to develop an explicit rating system that can be applied to individual non-GAAP exclusions and aggregated into a firm-level score on exclusion quality. Prior research has provided mixed evidence on whether exclusions inform investors or are used to opportunistically manipulate expectations (e.g., Frankel et al. 2011; Doyle et al. 2013; Bradshaw et al. 2018). Our firm-level exclusion quality score allows investors to systematically aggregate the myriad of exclusions and evaluate the likelihood of signaling versus opportunism.

Second, our rating system enables deeper analysis of non-GAAP reporting by industry, across firms, and over time. Prior research has focused on disaggregating exclusions into recurring and nonrecurring components (e.g., Doyle et al. 2003; Palmrose and Scholz 2004; Kolev et al. 2008). Having just two buckets of exclusions impedes observation of trends over time, across industries, or within a firm. Our metric provides an easy and parsimonious way to observe changes in trends, identify differences in exclusion quality across industries, and examine how a firm's exclusion quality evolves. Thus, our study contributes to the growing literature on the comparability and consistency of non-GAAP reporting (e.g., Black et al. 2021).

Third, our study complements other research considering reporting quality. Chen et al. (2021) develop a qualitative non-GAAP quality measure based on the narrative characteristics of non-GAAP disclosures. Their paper does not specifically focus on the quantitative information contained in non-GAAP exclusions. Our approach, in contrast, utilizes the rich quantitative information contained in individual non-GAAP exclusions and directly assesses the overall non-GAAP exclusion quality.

Finally, our rating system has practical value. The non-GAAP exclusion quality score can be easily calculated by financial information users, such as regulators, investors, and analysts, for assessing exclusion quality and helping in their decision-making. The exclusion quality score can also be used by future researchers investigating reporting quality and incentives, such as determining the quality of accounting-

based performance metrics in management compensation contracts or understanding the quality of exclusions in debt covenants.

Our paper proceeds as follows. Section 2 provides background information and our approach to determining the non-GAAP exclusion quality score. Section 3 discusses prior research on non-GAAP exclusion quality and develops our predictions. Section 4 describes our sample and data. Section 5 presents our results, and Section 6 concludes.

2. Developing a measure of non-GAAP exclusion quality

In this section, we first discuss why the use of non-GAAP earnings has increased over time. This discussion helps motivate the need for an easy-to-understand measure of non-GAAP exclusion quality. We then provide a conceptual framework for assessing non-GAAP exclusion quality. We do this since it is important to clarify the characteristics of exclusions we view as high or low quality when determining the score. We next describe the four approaches we adopt to rate exclusions and our procedure for aggregating exclusions and producing a firm-level measure of non-GAAP exclusion quality.

2.1 Why has the reporting of non-GAAP earnings increased over time?

Figure 1 provides a plot of the percentage of S&P 500 firms reporting non-GAAP EPS based on the latest data made available by Bentley et al. (2018). As mentioned in the introduction, Figure 1 indicates that the percentage has increased from around 50% to close to 80% from 2003 to 2020.

There are several reasons why the use of non-GAAP earnings has grown in prevalence. First, over time, the industry composition of U.S. stocks has moved away from manufacturing to high-tech, people-focused businesses. Unlike manufacturing, the valuation of these firms is not as strongly linked to GAAP earnings. The market's solution to this problem has been an increasing use of non-GAAP metrics, as a way of better explaining current firm performance.

A second reason for the rise in non-GAAP exclusion has to do with the evolving nature of accounting measurement rules. Accounting standards have increased in number and complexity over time, and the result is that components of GAAP earnings have mixed attributes. Some expensed items have

future benefits (e.g., R&D expense), and some transactions are not recognized in the financial statements in a timely fashion (e.g., revenue with future obligations). Some components could be economically relevant but transitory (e.g., unrealized security gains and losses), some are one-off charges reflecting downward valuation corrections to balance sheet items (e.g., goodwill impairments), while others reflect predictable and persistent outlays (e.g., cost of goods sold, depreciation). Finally, for certain items, practitioners or management disagree with rule makers on their measurement rules (e.g., stock compensation is viewed by some not as an expense but as an equity investment in human capital).

A third reason for the growth in non-GAAP reporting has to do with the instability, cyclicality, and volatility of the business environment. This means that some firms are divesting, writing off assets, and restructuring, while others are growing and merging or acquiring. These structural changes in businesses result in many nonrecurring items flowing through earnings, which managers exclude from non-GAAP earnings metrics as a better way of communicating core performance.

Finally, managers have discretion over what to exclude, when to exclude, and the level of detail to provide for non-GAAP exclusions. This discretion gives managers flexibility to manage expectations without having to engage in accrual or real earnings management (e.g., Black and Christensen 2009; Doyle et al. 2013; Black et al. 2017). Thus, the growing use of non-GAAP earnings could be partially due to management exploiting this source of flexibility.

In summary, there are legitimate reasons for why firms increasingly provide non-GAAP earnings measures. The fundamental reason stems from the misalignment between accounting standard setters' belief in the objectives of the accrual accounting system and the production of earnings and how investors and management view the role of accounting and the use of earnings. Standard setters tend to provide measurement rules that focus on valuations in the balance sheet, while investors are more interested in understanding the earning power of the firm (e.g., a measure that can illuminate current performance and serve a useful starting point for forecasting performance). However, due to the voluntary nature of non-GAAP reporting, management has discretion on which exclusions to use. This discretion can lead to a lack

of trust in management because exclusions could be used to make performance look better. Therefore, there is ambiguity and uncertainty as to the quality of non-GAAP exclusions. Our objective is to help resolve some of this ambiguity by providing a quality assessment of exclusions.

2.2 A conceptual framework for understanding the quality of individual non-GAAP exclusions

We take the perspective that investors desire a summary measure of performance that is useful for evaluating the efforts of management and is also a good indicator of "permanent cash flows", that is, the earnings that are likely to persist indefinitely into the future. From this perspective, the role of non-GAAP earnings is to produce a number that is closer to "permanent cash flows".

The typical decomposition of earnings (*GAAP E*) is into its accrual (*Acc*) and cash flow (*CF*) components:

$$GAAP\ E\ =\ Acc\ +\ CF. \tag{1}$$

Equation (1) can further be decomposed based on the likelihood of recurrence. Recurrence is a function of both the underlying economics driving the business and the accounting measurement rules. The underlying economics of the business impacts both cash flows and accruals, while the accounting measurement rules only impact accruals. Therefore, the cash and accrual components can be transitory (*T*), permanent (*P*), or somewhere in between (we call these neutral (*N*)):

$$GAAP\ E\ =\ Acc^{T} + Acc^{N} + Acc^{P} +\ CF^{T} + CF^{N} + CF^{P}. \tag{2}$$

Managers can choose what to exclude (*x*) from and what to include (*in*) in non-GAAP earnings (*NonGAAP E*):

$$GAAP\ E\ =\ Acc^{T\_in} + Acc^{N\_in} + Acc^{P\_in} +\ CF^{T\_in} + CF^{N\_in} + CF^{P\_in} + Acc^{T\_x} + Acc^{N\_x} + Acc^{P\_x} + CF^{T\_x} + CF^{N\_x} + CF^{P\_x}. \tag{3}$$

And so,

$$NonGAAP\ E\ =\ Acc^{T\_in} + Acc^{N\_in} + Acc^{P\_in} +\ CF^{T\_in} + CF^{N\_in} + CF^{P\_in}, \tag{4}$$

and

$$Total\ NonGAAP\ Exclusions\ =\ Acc^{T\_x} + Acc^{N\_x} + Acc^{P\_x} +\ CF^{T\_x} + CF^{N\_x} + CF^{P\_x}. \tag{5}$$

If we assume that users wish to understand the permanent or core earnings, then the quality of exclusions can be rated as follows:

$$High\ Quality\ Exclusions = Acc^{T\_x} + CF^{T\_x}; \quad (6a)$$

$$Neutral\ Quality\ Exclusions = Acc^{N\_x} + CF^{N\_x}; \quad (6b)$$

$$Low\ Quality\ Exclusions = Acc^{P\_x} + CF^{P\_x}. \quad (6c)$$

Our conceptual framework suggests that exclusion quality is contextual and requires a knowledge of the firm's business model as well as the accounting rules governing the recording of transactions. When assessing exclusion quality, we consider three aspects.

(1) *Economic nature: is the excluded item likely to recur?*

To assess whether an excluded item is likely to recur, we consider the economic transaction or event that generated the item. Our maintained assumption is that higher-quality exclusions are less likely to recur. For example, merger and acquisition costs are unlikely to recur in firms that are rarely involved in acquisitions, whereas R&D expense is likely to recur, so from an economic perspective, merger and acquisition costs are a higher-quality exclusion than R&D expense.

(2) *Accounting measurement: does the measurement rule induce transitory components in GAAP earnings?*

GAAP accounting rules can have an income statement perspective (matching the cost to the associated benefits of the activity) or a balance sheet perspective (adjustments to correct the value of items on the balance sheet). This results in a mixed-attribute measurement system that can lead to confusion because transitory items are not necessarily easily identifiable. An impairment charge is a correction of a balance sheet item that is typically one-off in nature, whereas unrealized fair value adjustments from trading securities are balance sheet corrections that are likely to recur for firms with continuing investments. In contrast, depreciation is an accounting adjustment that is likely to recur and relates directly to the firm's core earnings. Therefore, we would view exclusions of impairment charges as reasonable, exclusions of unrealized gains and losses on trading securities as reasonable but not as high quality as exclusions of

impairment charges, and exclusions of depreciation as lower quality than either exclusions of impairment charges or exclusions of unrealized gains and losses.

(3) *Valuation implication: is the excluded item relevant for forecasting cash flows?*

Litigation settlement costs are typically one-off cash outlays or accrued amount to be paid in the future. If an investor focuses on non-GAAP earnings that excludes the litigation charge, then this is unlikely to cause the investor to overestimate future cash flows. In contrast, interest expense is also typically a cash outflow, but it is likely to recur. Therefore, focusing on non-GAAP earnings that excludes interest charge is likely to lead the investor to overestimate future cash flows. Thus, from a discounted cash flow valuation perspective, we view the exclusion of litigation settlements as higher quality than the exclusion of interest expense.

Our conceptual framework for ranking exclusion quality is inherently subjective and different users could view exclusion quality differently. To ensure that the rating system is more likely to be agreed upon by most users and to improve its reliability, we use four approaches to classify exclusions into five quality buckets. When there is disagreement in classification of quality for an exclusion across the four approaches, we use our conceptual framework to guide our ultimate rating for that item. Below we provide details on the four rating approaches.

2.3 Rating individual non-GAAP exclusions

2.3.1. The serial correlation, AR(1), of the exclusion

We view transitory accruals or cash flows to be higher-quality exclusions than permanent accruals or cash flows. Therefore, our first approach to determining the exclusion rating is to use Compustat data (more details provided later in the paper) to calculate the persistence of each exclusion. We then rank the exclusions from high to low persistence and sort them into five quintiles, where quintile 1 contains low-quality persistent exclusions and quintile 5 contains high-quality transitory exclusions.

2.3.2. Academic ranking: survey of academics

We conduct an online survey of accounting academics to obtain their consensus on the quality of the exclusions. We view accounting academics as highly informed since they teach accounting, and many do research in accounting and so understand the properties of earnings, their valuation implications, and the incentives of management. We ask our survey respondents the following question:

> Below is a list of common exclusions from non-GAAP earnings. We would like you to rank the quality of these exclusions from 1 to 5. 1 (low quality) indicates that it is NOT REASONABLE to exclude the item from non-GAAP earnings. 5 (high quality) indicates that it is VERY REASONABLE for the item to be excluded from non-GAAP earnings. Please select a score for the following exclusions.

We obtain survey results from 101 accounting academics from leading business schools in the United States. We take the simple average of the respondents' rankings for each exclusion and sort the exclusions into quintiles, where quintile 1 contains the exclusions that academics view as the most unreasonable and quintile 5 most reasonable to exclude.

2.3.3. Practitioner ranking: survey evidence from the CFA Institute

The CFA Institute (2016) sent a survey to analysts and institutional investors asking them whether certain exclusions were reasonable (see their Table 3.2 on page 31).[2] This survey had over 500 respondents, of which more than 65% were buy-side analysts and portfolio managers and 19% were sell-side analysts. The survey reports the percentage of respondents viewing excluded items as *Usually Appropriate*, *Sometimes Appropriate/Inappropriate*, *Usually Inappropriate*, or *Not Sure*. We convert the CFA Institute's survey results into rankings from 1 to 5 for those corresponding exclusions in our sample.

Our conversion works as follows. First, if the percentage of respondents holding views of *Usually Appropriate* dominates other categories, we assign a ranking of 5, which indicates high quality. Similarly, if the percentage of respondents holding views of *Usually Inappropriate* dominates other categories, we assign a ranking of 1, which indicates low quality. For example, most respondents view one-off asset sales as appropriate to exclude (56%), so its corresponding item, *Gains/Losses on Sale of PPE*, in our sample

[2] See the CFA Institute (2016) at https://www.cfainstitute.org/-/media/documents/support/advocacy/investor-uses-expectations-concerns-on-non-gaap.ashx.

receives a practitioner ranking of 5. In contrast, most respondents agree that stock-based compensation is inappropriate to exclude (55%), and thus we rate *Stock Compensation Expense* as low quality.

Second, if there is a lack of consensus among the respondents such that the percentage of respondents holding a view of *Sometimes Appropriate/Inappropriate* dominates others, we further compare the relative prevalence of their views between *Usually Appropriate* and *Usually Inappropriate.* If *Usually Appropriate* is higher, we assign a ranking of 4 or 3, which indicates medium-high or neutral quality. If *Usually Inappropriate* is higher, we assign a ranking of 2 or 3, which indicates medium-low or neutral quality. We decide the specific ranking from 2 to 4 based on the CFA Institute's detailed discussion. For example, 45% of the respondents hold a mixed view of *Sometimes Appropriate/Inappropriate* on merger and acquisition costs, and 30% of them lean toward *Usually Appropriate* while 21% lean toward *Usually Inappropriate*. The CFA Institute suggests that sell-side analysts tend to consider it usually appropriate to exclude merger and acquisition costs and these charges are similar to restructuring charges in nature. Thus, we assign a rating of medium-high quality to *Merger/Acquisition Costs*.

2.3.4. Regulator ranking: China Securities Regulatory Commission's non-GAAP reporting guidelines

The SEC does not provide explicit guidance on what exclusions are appropriate for non-GAAP reporting, while the CSRC classifies certain components of earnings as extraordinary and approves their exclusion for non-GAAP reporting.[3] We assign a rating of 4.5 for the corresponding exclusions approved by the CSRC.

Exhibit 1 presents the ratings from each of the four approaches, and in the first column, we provide the final rating for the exclusion. The four approaches to our rating largely agree with each other. When they disagree, we account for different perspectives and determine the final ratings based on our conceptual framework. Appendix 1 provides more details on our considerations when determining the final rating. The

[3] See Jennings et al. (2023) and the CSRC's guidelines at http://www.csrc.gov.cn/csrc_en/c102034/c1371419/content.shtml.

bottom row of Exhibit 1 indicates that our exclusion quality rating is highly correlated with all the four inputs, of which the academic ranking has a correlation of 96%.

2.4 Calculating the non-GAAP exclusion quality score

After assigning ratings to individual exclusions, the next step is to provide a summary measure of non-GAAP exclusion quality for each firm-year in our sample. We calculate the non-GAAP exclusion quality score across all *N* exclusions for firm *i* in year *t* using the following formula:

$$Exclusion\ Quality\ Score_{i,t} = \sum_{n=1}^{N} Rating_n \times \frac{abs(Magnitude_{i,n,t})}{\sum_{n=1}^{N} abs(Magnitude_{i,n,t})}, \quad (7)$$

where $Rating_n$ is the exclusion quality rating of item *n* and $abs(Magnitude_{i,n,t})$ is the absolute magnitude of item *n* for firm *i* in year *t.*

Each individual exclusion is given a rating from 1 (*Low Quality*) to 5 (*High Quality*). The firm-level quality score is designed such that firms with lower overall non-GAAP exclusion quality have lower scores and firms with higher overall non-GAAP exclusion quality have higher scores. Thus, a firm's exclusion quality score will depend on the choices made by managers and the quality of individual exclusions.

In our sample, more than 79% of exclusions are expenses and losses (i.e., income-increasing for non-GAAP earnings), and the remaining 21% are gains (i.e., income-decreasing for non-GAAP earnings). We assign income-decreasing exclusions a neutral rating of 3 for two reasons. First, they lead to lower non-GAAP earnings than GAAP earnings and so are less likely to be opportunistic. Second, most income-decreasing exclusions relate to recognizing the tax benefits of an excluded item (*Tax Impact of Exclusions*) and therefore are generated by exclusions of varying qualities. We assign a neutral rating primarily because of the ambiguity in interpreting gains and tax benefits, and we do not want these exclusions to unduly influence the overall score.

We identify the individual exclusions that are reconciled to net income (before noncontrolling interests) and their magnitudes for a firm's most aggressive non-GAAP metric during the year. We choose to evaluate the most aggressive metric for two reasons. First, we aim to capture the full extent of managers'

discretion in non-GAAP exclusions when assessing non-GAAP exclusion quality. Second, our objective is to provide investors with a score that is useful for valuation. The most aggressive non-GAAP metrics, such as EBITDA, have important valuation implications and can mislead investors, even when the firm is following industry practice to report such metrics. We find that a significant portion of SEC comment letters issued to our sample firms questions their use of EBITDA as a non-GAAP metric, consistent with the regulator's concern that EBITDA could mislead investors. Appendix 2 presents a sample of examples from SEC comment letters regarding firms' use of EBITDA as a non-GAAP metric.

Exhibit 2 provides two examples of calculating the non-GAAP exclusion quality score. In the first example, Panel A presents the reconciliation between non-GAAP and GAAP earnings reported by Johnson & Johnson for its fiscal year 2017. Panel B presents the exclusions reported by Johnson & Johnson, which are mapped to our rating system in Exhibit 1, along with the corresponding exclusion quality rating ($Rating_n$) for each item in Column 1. Columns 2 and 3 provide the exclusion amount ($Magnitude_{i,n,t}$) and its absolute value $abs(Magnitude_{i,n,t})$, respectively. Column 4 calculates the proportion of total absolute exclusions each item accounts for, used as the weight in developing the overall weighted average exclusion quality score. The last column of Panel B reports the final weighted exclusion quality score for each item and presents the firm-level exclusion quality score of 4.32 for Johnson & Johnson. This score suggests that Johnson & Johnson has high-quality exclusions.

Panel C provides the reconciliation between non-GAAP and GAAP earnings reported by Transdigm Group in 2017. Panel D presents its exclusions, calculates the final weighted exclusion quality score for each item, and provides the firm-level exclusion quality score of 1.68. This score suggests that Transdigm Group has low-quality exclusions.

3. Prior research and predictions

The literature on managers' non-GAAP reporting is extensive, and so we limit our discussion to how developing the non-GAAP exclusion quality score adds to prior research. For a comprehensive discussion of the non-GAAP literature, see Black et al. (2018).

3.1 Prior research on non-GAAP exclusions

The question of which items should be excluded from non-GAAP earnings has received considerable attention from researchers. However, because of the variety of non-GAAP exclusions and the lack of rules governing what should be excluded, researchers have made different trade-offs between sample size and data granularity. Early studies, using large-sample data from I/B/E/S, often decompose total exclusions into nonrecurring (special) and recurring items (e.g., Bradshaw and Sloan 2002, Doyle et al. 2003; Palmrose and Scholz 2004; Kolev et al. 2008). More recent studies collect and analyze non-GAAP earnings data from earnings releases for selected samples over shorter periods and are able to identify a limited number of exclusions used by firms (e.g., Bhattacharya et al. 2003; Black and Christensen 2009; Christensen et al. 2014; Bentley et al. 2018). Because of the variety of exclusions, researchers generally have an "other" exclusion category that outnumbers all identified individual exclusions. Thus, the characteristics and variety of these "other" items are lost in the aggregation process. For example, Black et al. (2021) focus on managers' non-GAAP reporting per se.[4] They examine both the frequency and magnitude of 15 individual exclusions and use a category of "uncommon items" for all other exclusions.

As far as we are aware, our study is the first to propose a summary diagnostic measure to evaluate firms' non-GAAP exclusion quality. Our study contributes to this line of literature by (1) identifying a more comprehensive list of individual non-GAAP exclusions (22 items) for more recent years from 2013 to 2017; (2) providing a conceptual framework to better understand exclusions based on the economic nature, accounting measurement, and valuation implications that can be used by future research as more exclusion types come to light; (3) developing a rating system that can help financial information users determine the quality of individual exclusions; and (4) aggregating the exclusions with varying qualities into an overall exclusion quality score that financial information users can readily use in their decision-making.

[4] Black et al. (2021) use a similar sample and classification as Black et al. (2018), providing a landscape of non-GAAP reporting practices among S&P 500 firms during 2009–2014.

Prior research has provided mixed evidence on whether exclusions are used to inform investors or to opportunistically manipulate expectations (e.g., Frankel et al. 2011; Doyle et al. 2013; Bradshaw et al. 2018). A contribution to this line of research is that our approach of providing a summary score of exclusion quality allows users to more easily aggregate the myriad of different exclusions and assess the likelihood of signaling versus opportunism on a case-by-case basis.

In a more recent study, Chen et al. (2021) develop a non-GAAP reporting quality measure based on the narrative characteristics of non-GAAP disclosures. They examine 12 qualitative aspects of non-GAAP disclosures and presentations, including reasoning, labeling, equal prominence as GAAP earnings, clear reconciliation with GAAP earnings, consistency, and clear tax presentation. They find that the qualitative quality score is associated with the transitory nature of non-GAAP exclusions and the likelihood of managerial opportunism in beating analyst forecasts. Their paper is the first to provide a direct measure of non-GAAP reporting quality but does not specifically focus on the quantitative information contained in non-GAAP exclusions. Our research complements the work of Chen at al. (2021) by developing a quantitative non-GAAP exclusion quality score that directly assesses the overall exclusion quality of non-GAAP earnings.

3.2 Predictions

Our empirical predictions focus on the implications of exclusion quality for different users of financial information, including regulators, financial analysts, and investors. Prior research predicts that firms with lower reporting quality will undergo more regulatory scrutiny. The SEC regularly reviews the filings of public companies and sends comment letters to companies with questionable disclosures. Even after the implementation of Regulation G, an ongoing focus in SEC comment letters is on aggressive and potentially misleading non-GAAP reporting (Jo and Yang 2020; Gomez et al. 2023). Thus, we predict the following:

Prediction 1: *The SEC is more likely to issue comment letters and citations for Regulation G violations for firms with lower non-GAAP exclusion quality scores.*

Bentley et al. (2018) document that managers' non-GAAP adjustments largely overlap with analysts' adjustments, but they can also differ in systematic ways. Specifically, they find that street earnings forecasted by analysts tend to make nonrecurring, higher-quality non-GAAP adjustments. Therefore, we expect that firms with lower exclusion quality will have made exclusion choices that deviate from analysts' adjustment choices. As a consequence, analysts are more likely to have differing opinions about the non-GAAP adjustments that they should include or exclude, and this in turn will create higher forecast dispersion. Lower-quality non-GAAP exclusions are also likely to increase analysts' information processing costs, which increases their forecast dispersion (e.g., De Franco et al. 2011).

Prediction 2: *There is greater dispersion of analysts' forecasts of earnings for firms with lower non-GAAP exclusion quality scores.*

If investors face more difficulty processing reported information that is of lower quality because they are not able to fully undo managers' discretion, then it will take longer for earnings information to be incorporated into prices (e.g., Blankespoor et al. 2020). For example, Doyle et al. (2003) find that investors do not fully impound the implications that recurring non-GAAP exclusions have on future cash flows at the time of earnings announcements. Christensen et al. (2014) show that short sellers exploit the market's lagged response to low-quality non-GAAP earnings disclosures to profit from subsequent negative stock returns. McVay et al. (2024) suggest that investors' experience with non-GAAP earnings affects their pricing of non-GAAP exclusions. Therefore, if non-GAAP exclusion quality captures an aspect of reporting quality, our results should be consistent with the following prediction:

Prediction 3: *It takes investors longer to assimilate earnings news at earnings announcements into price for firms with lower non-GAAP exclusion quality scores.*

4. Data and sample

We obtain data on firms' non-GAAP exclusions from Audit Analytics. This dataset consists of both annual and quarterly non-GAAP metrics and non-GAAP-to-GAAP reconciliation reported by S&P 500

firms from December 2013 to June 2018.[5] We focus on annual data since assessing firms' non-GAAP quality on an annual basis will allow us to include all items that are excluded during the fiscal year. From Audit Analytics, we obtain data for 547 unique firms with annual earnings reports, which gives us an initial sample of 1,937 firm-year observations. We then remove 261 firm-years that did not report a non-GAAP metric for net income, EPS, operating income, EBIT, or EBITDA. For firms reporting non-GAAP metrics but lacking non-GAAP-to-GAAP reconciliation data in Audit Analytics, we manually collect the reconciliation data from their Form 8-Ks. Our final sample consists of 1,676 firm-years for 491 unique firms, and we identify a total of 8,435 individual exclusions for our sample firms. The sample sizes for subsequent tests vary based on data availability of the control variables necessary for each analysis. We obtain financial data from Compustat, stock return data from CRSP, institutional ownership data from Thomson Reuters, analyst forecast data from I/B/E/S, and SEC comment letter and Regulation G violation data from Audit Analytics. Appendix 3 provides the definition and data source for our variables.

Panel A of Table 1 presents the summary statistics of our sample. The mean value of the exclusion quality score is 2.75, which indicates the overall quality of non-GAAP exclusions is between medium low and neutral. The standard deviation of the exclusion quality score is 1.06, with an interquartile range from 1.86 to 3.59. On average, our sample firms have five non-GAAP exclusions per year, and the interquartile values range from 3 to 7. The mean (median) value of *Total Exclusion/GAAP* is 1.27 (0.39), indicating that the magnitude of total exclusions accounts for 127% (39%) of GAAP earnings.

Panel B of Table 1 presents the breakdown of our sample by different non-GAAP reporting choices. We identify three broad reporting choices: (1) only report EBITDA (0.8% of the sample), (2) report both EBITDA and another non-GAAP metric (18.7% of the sample), and (3) report a single non-GAAP metric other than EBITDA (80.5% of the sample). We identify EBITDA as traditional EBITDA as well as adjusted

[5] Audit Analytics provides non-GAAP reporting data for S&P 500 firms with a fiscal year-end from December 31, 2013 to June 30, 2018. The data has limited coverage for 2018, and therefore we do not include observations in 2018.

versions of EBITDA. For firms reporting a single non-GAAP metric other than EBITDA, we find that they choose to report an adjusted EBIT (3.3%), adjusted operating income (30.1%), or adjusted EPS (47.1%).

Panel B of Table 1 also presents the average and total number of exclusions and the average exclusion quality score for different groups of firms by their non-GAAP reporting choice. We find that firms reporting EBITDA (Groups 1 and 2) tend to have lower exclusion quality scores than firms that do not report EBITDA (Group 3), and that firms reporting both EBITDA and another non-GAAP metric have the highest number of exclusions on average. This could be attributable to our empirical design, which evaluates a firm's non-GAAP exclusion quality based on its most aggressive metric.[6] We acknowledge that our measurement could mechanically underrate firms reporting both EBITDA and another non-GAAP metric, which account for 18.7% of our sample, if investors and management were to focus on the non-GAAP metric rather than EBITDA. Therefore, in our additional analyses, we apply an alternative construct of our score to this sample of firms so that their exclusion quality is based on their less aggressive metric. In addition, we also use an alternative sample excluding such firms for robustness tests.

5. Empirical results

5.1 The landscape of non-GAAP exclusions

We first summarize the descriptive patterns in non-GAAP reporting for a sample of 8,435 individual exclusions. We begin with the full sample and then explore the variations across different metrics of non-GAAP earnings (i.e., EBITDA, EBIT, operating income, and EPS).

Table 2 presents the frequency and average magnitude for individual non-GAAP exclusions. For the full sample, we find that the most frequent exclusions identified are merger and acquisition costs

[6] This empirical design does not affect firms with only a single non-GAAP metric (Groups 1 and 3) but only impacts firms with multiple non-GAAP metrics (Group 2). Prior studies of non-GAAP earnings are mixed on whether EBITDA should be included as a non-GAAP metric. For example, Black et al. (2018) and Chen et al. (2021) choose to focus on non-GAAP metrics other than EBITDA, whereas Laurion (2020) and Laurion and Sloan (2022) include EBITDA as a non-GAAP metric. Our inclusion of EBITDA allows us to capture the full extent of managers' discretion in non-GAAP exclusions when assessing non-GAAP exclusion quality. Moreover, it is consistent with our score's valuation perspective, as EBITDA could have important valuation implications.

(11.49%), the tax impact of non-GAAP exclusions (9.02%), depreciation and amortization (8.74%), and restructuring charges (7.79%), which have varying exclusion quality.[7] Figure 2 visualizes the distribution of non-GAAP exclusions. In terms of the magnitude, the top four exclusions with the highest net impact on non-GAAP earnings are *Depreciation and Amortization* (*Low Quality*), *Net Interest Expense* (*Low Quality*), *Impairment on PPE and Intangible Assets* (*Medium High Quality*), and *Stock Compensation Expense* (*Low Quality*). None of the four are classified as high-quality exclusions. The average magnitude of *Depreciation and Amortization* is 1.03, suggesting that firms exclude depreciation and amortization expense that is of a magnitude comparable to their GAAP earnings. The average magnitude of interest expense, impairment, and stock compensation expense is 52.8%, 48%, and 41.8% of GAAP earnings, respectively.

Turning to EBITDA-reporting firms, the most frequent exclusions are *Depreciation and Amortization* (14.43%), *Tax Impact of Exclusions* (12.99%), and *Net Interest Expense* (12.59%), consistent with the definition for earnings before interest, tax, depreciation, and amortization.

Table 2 indicates that the majority of our sample report adjusted measures of operating income (N = 505) and EPS (N = 790). For such firms, *Depreciation and Amortization* and *Tax Impact of Exclusions* become less frequent than for EBITDA-reporting firms but remain more prevalent than most other exclusions. For example, *Depreciation and Amortization* and *Tax Impact of Exclusions* account for 5.99% and 9.66% of exclusions within firms reporting adjusted EPS, respectively, while this number is 1.11% for a high-quality exclusion of *Gains/Losses on Sale of PP&E*. Moreover, *Depreciation and Amortization* has a magnitude comparable to GAAP earnings, which is 92.1% and 98.4% for firms reporting operating income and adjusted EPS, respectively, while the exclusion of transitory items (i.e., high-quality exclusions) on average has a much lower magnitude.

Table 2 also shows that the exclusion of nonrecurring items is more frequent for firms reporting non-GAAP metrics other than EBITDA. Specifically, for adjusted measures of operating income and EPS,

[7] Audit Analytics does not provide separate exclusion data for income tax expense, but it combines the income tax expense with all other tax adjustments resulting from other non-GAAP exclusions. Therefore, *Tax Impact of Exclusions* has a mixed nature, and we assign it a neutral quality score.

higher-quality exclusions, such as *Merger/Acquisition Costs*, *Tax/Accounting Rule Changes*, and *Restructuring Charges*, become more prevalent than for EBITDA. This is consistent with the higher exclusion quality score for firms reporting non-GAAP metrics other than EBITDA.

Panel A of Figure 3 plots the frequency of individual exclusions. We differentiate between income-decreasing (i.e., reducing non-GAAP earnings relative to GAAP earnings) and income-increasing (i.e., increasing non-GAAP earnings relative to GAAP earnings) exclusions. In our sample, 79% of exclusions increase non-GAAP earnings, while the remaining 21% decrease non-GAAP earnings relative to GAAP earnings. The top four most frequent income-increasing exclusions are *Merger/Acquisition Costs*, *Depreciation and Amortization*, *Restructuring Charges*, and *Impairment on PPE and Intangible Assets*. Most exclusions have a smaller proportion of cases decreasing non-GAAP earnings relative to GAAP earnings. Only *Merger/Acquisition Costs* and *Tax Impact of Exclusions* have more than 200 income-decreasing cases, and these two exclusions account for 32% of all income-decreasing exclusions.[8] Panel B of Figure 3 provides the average magnitude of exclusions, conditional on their impact on non-GAAP earnings.[9] Overall, we find that, within each quality category, the magnitude of exclusions varies considerably, suggesting that our exclusion quality score does not merely rank on the relative magnitude of exclusions.

Panel A of Figure 4 plots the number of firms reporting different non-GAAP metrics by year. The number of EBITDA-reporting firms increases from 44 to 96 over the period between 2013 and 2017. In terms of the percentage of such firms in a given year, this represents an increase from 20% to 23% between 2013 and 2017. The percentage of firms reporting adjusted operating income slightly increases from 25% to 28%. The number of firms reporting adjusted EPS increases from 124 to 195 over the same period, while

[8] In our sample, income-decreasing exclusions for *Tax Impact of Exclusions* relate to recognizing the tax benefits of a non-GAAP exclusion. Examples of income-decreasing exclusions for *Merger/Acquisition Costs* include the exclusions of gains on divestures of property or a business unit related to the M&A, gains from sale of intellectual property during M&A, and gains related to adjustments to previously provisioned items.

[9] While there are only seven and two income-decreasing exclusions for *Rent and Lease Expenses/Adjustments* and *New Initiatives/Start-up Costs*, respectively, they have extremely high values, which are much larger than their corresponding income-increasing exclusions. This explains why the patterns appear to flip from Panel A to B in Figure 3.

there is a decline from 55% to 46% in terms of percentage. Overall, our evidence suggests that EBITDA and adjusted operating income are increasing in popularity over time, while adjusted EPS is the most widely used metric.

Panel B of Figure 4 plots the number of exclusions by quality and year. The total number of exclusions for S&P 500 firms steadily increased each year and more than doubled, from 1,021 to 2,251 during the period from 2013 to 2017. Specifically, *Low Quality* exclusions increased by 134%, from 291 to 680 exclusions over the period, while the number of *High Quality* exclusions increased by 119%, from 185 to 406 over the same period. Our time-series evidence is consistent with Rozenbaum's (2019) finding that the percentage of firms reporting EBITDA at earnings announcements doubled from 2003 to 2011. Additionally, we plot the average number of exclusions per firm from 2013 to 2017. We find a steady increase in the average number of exclusions from 4.65 to 5.30 during this period. The evidence in Figure 4 indicates that firms are reporting more exclusions and these exclusions can vary significantly in quality.

Table 3 presents a landscape of individual non-GAAP exclusions used by S&P 500 firms. We first provide a measure of "acceptability" in Column 3, which is the percentage of firms excluding an item (Column 1), conditional on reporting it in GAAP earnings (Column 2).[10] Column 4 provides an indication of how common the item is, "commonality," which is the percentage of firms reporting the item in the total sample of 1,676 firm-years. Column 5 provides an indication of the "prevalence" of the exclusion, which is the percentage of firms excluding the item out of the total sample of 1,676 firm-years.[11]

Some interesting patterns emerge from Table 3. Specifically, for the low-quality exclusions, Column 4 indicates that around 95% of firms report depreciation and interest expense, and Column 3

[10] We identify firms excluding the item using Audit Analytics and firms reporting the item using Compustat. We are able to calculate the "relative" percentage for exclusions with corresponding values in Compustat. For four identifiable exclusions (i.e., *Executive Severance/Termination Costs*, *Tax Impact of Exclusions*, *New Initiatives/Start-up Costs*, and *Tax/Accounting Rule Changes*), there are no corresponding values in Compustat, and thus the "relative" percentage cannot be measured.

[11] Column 3 of Table 3 presents the relative percentage of firms excluding the item out of all firms that report the item. We find that the average percentage of firms with low-quality exclusions is 21%, while this number is 62% for high-quality exclusions, suggesting that more common exclusions are in general classified as more appropriate exclusions in our rating system.

indicates that these two items are excluded by over 46% and 30% of firms that report them, respectively. Thus, at least one-third of our sample that have these items are excluding them to report some measure of EBITDA. Notably, these percentages for depreciation and interest expense are much higher than the proportion of our sample firms reporting EBITDA or EBIT (around 23% as reported in Panel B of Table 1) as their non-GAAP metrics, suggesting that not only EBITDA and EBIT entail such exclusions but many more non-GAAP metrics other than EBITDA or EBIT adjust for these recurring expenses.

Focusing only on the percentage of firms excluding an item (Column 5) can give a biased view of an item's "acceptability" for exclusion because it does not take into account whether the firm had the item to exclude. For example, 16.65% of firms exclude *Pension Expense/Adjustments*. However, conditional on the number of firms reporting the item, 81.1% of firms actually exclude pension charges, suggesting that this exclusion is "acceptable". In contrast, 20.23% of firms exclude *Stock Compensation Expense*, but this is a very commonly reported expense, and so when considering the "acceptability" of excluding stock compensation, the results in Column 3 indicate that only 20.58% of firms that have *Stock Compensation Expense* actually exclude it. This suggests that it is more acceptable to exclude pension expense/adjustments than to exclude stock compensation expense.

Turning to exclusions classified as higher quality, Column 4 indicates that 38.19% of firms report *Impairment on PP&E and Intangible Assets*, while Column 3 indicates that the vast majority of these firms (87.66%) exclude them from non-GAAP earnings. This suggests that excluding impairments is an acceptable practice. Similarly, *Merger/Acquisition Costs* are both commonly reported (65.75%) and almost always excluded (87.93%). In contrast, reporting *Debt Extinguishment/Refinancing Costs* is rare (27.74%) but 70.75% of reporting firms exclude it. Like debt extinguishments, 25.74% of our sample firms recognize *Litigation/Settlement Costs*, and 93.97% of reporting firms exclude this item. Finally, we find that most firms tend to exclude nonrecurring items, such as *Restructuring Charges* (72.44%) and gains and losses from discontinued operations (90.52%), when they occur.

Figure 5 provides the "acceptability" percentage for non-GAAP exclusions. Panel A plots the items where more than half of sample firms exclude when they occur, and Panel B plots the items that are less commonly excluded. Panel A reveals that the majority of "acceptable" exclusions are classified as *Medium High* and *High Quality*. Panel B reveals that less common exclusions have varying exclusion qualities. Panel B further shows that the only *High Quality* exclusion that is uncommon to exclude is *Gains/Losses on Sale of PP&E* (23%). We investigate why this is a less common exclusion, even though our survey evidence suggests it is high quality. In untabulated results, we find that 35% of our sample exclude this item when the gains or losses are above the sample median, while only 21% exclude it when they are below the median. Therefore, when this item has a more material impact on earnings, managers are more likely to exclude it.

Overall, our descriptive evidence suggests that the exclusion of recurring expenses (i.e., low-quality exclusions) are frequent and have a larger impact on non-GAAP earnings than the exclusion of transitory items (i.e., high-quality exclusions). This evidence highlights the new and evolving trends in non-GAAP reporting.

5.2 The consistency and comparability of non-GAAP exclusion quality

Based on our non-GAAP exclusion quality score, we next examine whether non-GAAP reporting is consistent within a firm over time and whether firms in the same industry have similar non-GAAP exclusion quality.

Table 4 investigates the persistence of a firm's non-GAAP exclusion quality and whether it is correlated with other earnings persistence measures. We sort firms into five groups of exclusion quality (i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*), based on the quintile ranks of exclusion quality scores by year, and examine the distribution of firms by non-GAAP exclusion quality in two consecutive years. Panel A of Table 4 indicates that, within each current year's quality group, most firms are in this same exclusion quality group in the prior year. If exclusion quality were random, then we would expect 20% of firms to stay in the same group. The results, however, indicate that more than 43% of firms stay in the

same exclusion quality group for two consecutive years, suggesting that many firms adopt consistent non-GAAP reporting practices year over year. This evidence is consistent with our expectation that exclusion quality is serially correlated over time due to firms' consistently excluding certain items. Table 4 Panel B provides the correlation between the non-GAAP exclusion quality score and the persistence of GAAP as well as non-GAAP earnings. All correlations are small, suggesting that the exclusion quality is not merely reflecting earnings persistence.

Table 5 provides the average exclusion quality scores by industry. We find that the three industries with the lowest average exclusion quality scores are *Real Estate Investment Trusts*, *Recreation*, and *Precious Metals and Mining*. These industries all tend to exclude depreciation from their non-GAAP metrics. The three industries with the highest average exclusion quality scores are *Wholesale*, *Business Supplies and Containers*, and *Consumer Goods*. These industries tend to report operating income or non-GAAP EPS. Furthermore, the average standard deviation of the exclusion quality scores across industries is 0.98 with more than 70% of industries having a lower standard deviation than the full-sample standard deviation of 1.06. This is consistent with firms in the same industry excluding similar items to aid comparability. In untabulated results, we find that almost all firms in the *Real Estate Investment Trusts* industry exclude depreciation; more than half of firms in *Personal and Business Services* exclude stock compensation; and more than half of firms in *Banking, Insurance, and Real Estate* exclude unrealized fair value adjustments from trading securities. In Table 5, we also see some clustering of the non-GAAP measures used at the industry level. For example, 85% of *Recreation* firms and 45% of *Chemical* firms report EBITDA.

Taken together, the results in Tables 4 and 5 suggest that many firms adopt consistent non-GAAP reporting practices year over year and that firms within the same industry choose to make their non-GAAP reporting comparable.

5.3 The determinants of non-GAAP exclusion quality

Table 6 examines the determinants that explain firms' non-GAAP exclusion quality. We examine three types of firm characteristics: firm fundamentals, stock market pressure, and financial reporting quality. In Panel A of Table 6, we sort firms into five groups based on the quintile ranks of their exclusion quality scores. We compare the mean values of firm characteristics between the *High* and *Low Quality* groups. We first report measures related to non-GAAP exclusions. Low-quality firms tend to have more exclusions, and their total exclusions are almost twice the size of absolute GAAP earnings and are significantly larger than those of the high-quality group. We create an indicator variable, *I(Non-GAAP>EBITDA*), which equals one when non-GAAP earnings exceeds EBITDA. Approximately 43% of low-quality firms are reporting a non-GAAP earnings metric greater than EBITDA, while this number is only 3% for high-quality firms.

We next turn to firm characteristics. We first examine firm fundamental variables. Low-quality firms are smaller in size, younger, exhibit higher sales growth, and have higher leverage relative to high-quality firms. There is, however, no significant difference in profitability or the likelihood of reporting losses across the low and high groups. Turning to market pressure proxies, we find that low-quality firms have higher past stock returns, higher expected returns implied by target price forecasts, greater institutional ownership, and lower valuation multiples, including forward earnings-to-price and book-to-market ratios. Turning to the metrics on financial reporting quality, we do not find evidence that our non-GAAP exclusion quality score is associated with the F-score, the absolute value of accruals, or discretionary accruals (e.g., Kothari et al. 2005; Dechow et al. 2011). This finding mitigates the concern that our measure of non-GAAP exclusion quality is reflecting existing measures of earnings quality. Panel B of Table 6 presents multivariate regression analyses of the exclusion quality score on firm characteristics. The results are broadly consistent with the univariate results presented in Panel A.

In summary, the results in Table 6 indicate that firms with lower-quality exclusions have a higher magnitude of total exclusions and are more likely to report a non-GAAP earnings metric that is greater in magnitude than EBITDA. We also find that firms with lower-quality exclusions are younger, exhibit higher

sales growth, and have higher past stock returns and greater institutional ownership. Thus, the overall picture provided by Table 6 is that firms with strong past performance appear more eager to exclude items that we view as low quality because they feel pressure from stock market participants to show strong operating performance.

5.4 The impact of non-GAAP exclusion quality on different financial information users

We investigate the implications of non-GAAP exclusion quality for three financial statement users: regulators, analysts, and investors.

5.4.1 Regulators

We first investigate whether non-GAAP exclusion quality predicts future regulatory attention. We examine the association between a firm's non-GAAP exclusion quality score and its likelihood of receiving SEC comment letters and citations for Regulation G violations. We measure exclusion quality for the current year's non-GAAP earnings and identify future regulatory scrutiny and enforcement actions against that year's non-GAAP reporting.

The firms in our sample have received 171 SEC comment letters between 2013 and 2017. Table 7 Panel A reports the main issues related to non-GAAP earnings that we identified in SEC comment letters. Note that comment letters can address multiple issues. We find that 56.73% of comment letters question firms' presentation of non-GAAP metrics. The focus relates mostly to the more prominent positioning of non-GAAP metrics over GAAP earnings. We find that 47.37% of comment letters relate to the unclear or incomplete reconciliation of non-GAAP earnings to GAAP earnings while 31.58% of comment letters relate to specific non-GAAP exclusions and request more justification for the exclusions. Panel A of Table 7 also reports the average exclusion quality score. The lowest average exclusion quality scores occur when the SEC questions specific exclusions, consistent with the SEC concerns being correlated with our measure of exclusion quality. Finally, there is a considerable number of SEC comment letters (15.79%) questioning firms' use of adjusted EBITDA as a non-GAAP metric, suggesting that the SEC views EBITDA metrics as

being lower quality. Appendix 2 presents examples of SEC comment letters on these four issues in non-GAAP reporting.

Panel B of Table 7 reports results from logistic regressions of regulatory outcomes on the exclusion quality score. Consistent with *Prediction 1*, the coefficient on *Exclusion Quality Score* is negative and significant, suggesting that firms with lower non-GAAP exclusion quality scores are more likely to receive SEC comment letters and citations for Regulation G violations in the future. We control for the determinants of exclusion quality and the magnitude of total exclusions, along with industry and year fixed effects. Based on the estimation in Columns 1–2 (coefficient = –0.190, *z*-statistic = –2.19), a one-unit decrease in the exclusion quality score is associated with a 17% (= $1 - e^{-0.190}$) increase in the likelihood of receiving SEC comment letters. Based on the estimation in Columns 3–4 (coefficient = –0.362, *z*-statistic = –2.66), a one-unit decrease in the exclusion quality score is associated with a 30% (= $1 - e^{-0.362}$) increase in the odds of having Regulation G violations. Unlike the exclusion quality score, the magnitude of non-GAAP exclusions relative to GAAP earnings does not explain future regulatory outcomes. Overall, the evidence suggests that it is the economic nature or the quality of exclusions, rather than their magnitude, that attracts more regulatory scrutiny. These results confirm that the construction of our non-GAAP exclusion quality score is correlated with regulators' view of non-GAAP exclusion quality.

5.4.2 Financial analysts

When managers' non-GAAP adjustment choices are more discretionary or less appropriate from analysts' point of view, analysts will have more divergent opinions about the non-GAAP adjustments they should make, and therefore forecast dispersion is likely to be higher. To test *Prediction 2*, we estimate an OLS regression of analyst forecast dispersion on the exclusion quality score. We include several additional variables to control for uncertainty in firms' performance and analyst forecast horizon. Table 8 reports the regression results. Consistent with *Prediction 2*, we find a negative and significant relation between our score and forecast dispersion (coefficient = –0.023, *t*-statistic = –2.20), suggesting that, for firms with lower

non-GAAP exclusion quality, their analysts appear to provide forecasts with greater dispersion before earnings announcements.

The results also show that the coefficient on *Total Exclusion/GAAP* is insignificant (coefficient = –0.002, *t*-statistic = –0.56), suggesting that analyst forecast dispersion is unaffected by the magnitude of non-GAAP exclusions relative to GAAP earnings. Recall from Table 7 that the magnitude of non-GAAP exclusions does not explain future regulatory outcomes. Collectively, these findings indicate that regulators and analysts pay more attention to the quality rather than the magnitude of non-GAAP exclusions.

5.4.2 Investors

We next explore whether investors' response to earnings announcements vary with firms' non-GAAP exclusion quality. We do this by using measures of price discovery over a short window following earnings announcements. We expect investors to find it more challenging to process non-GAAP earnings information when exclusion quality is low.

We estimate OLS regressions of the speed of price discovery on the exclusion quality score, controlling for other determinants of price discovery and firm characteristics associated with exclusion quality. The speed of price discovery, intra-period efficiency (*IPE*), is an area-under-the-curve measure of the speed of price adjustments within a period of time (Blankespoor et al. 2020). This measure is based on a firm's abnormal return over a short window following the earnings announcement and captures the speed at which earnings news is incorporated into stock prices through daily price adjustments, where faster price adjustments reflect higher price responsiveness to news.

Table 9 reports the regression results. Consistent with *Prediction 3*, the coefficients on *Exclusion Quality Score* are positive and significant over both a five- and a ten-day measurement window following the earnings announcement, suggesting that firms with lower non-GAAP exclusion quality have slower price discovery. For example, the coefficient on *Exclusion Quality Score* is 0.020 with a *t*-statistic of 2.50 for price discovery over the first five trading days after earnings announcements. In terms of economic significance, a one-unit decrease in the exclusion quality score is associated with a 2% decrease in the

efficiency of price discovery, which represents 3.3% of its mean value. This result is comparable to prior findings (e.g., Twedt 2016).

In addition, we find that the coefficients on *Total Exclusion/GAAP* are negative and significant (e.g., coefficient = –0.004, *t*-statistic = –2.82), suggesting that firms with a higher magnitude of non-GAAP exclusions have slower price discovery. This result indicates that investors, unlike regulators and analysts, are influenced by the magnitude of total exclusions. When facing exclusions of large magnitudes, investors incur more processing costs when reconciling non-GAAP earnings with GAAP earnings, which impedes the speed of price discovery following earnings announcements.[12]

5.5 Additional analyses for firms reporting both EBITDA and another non-GAAP metric

Tables 7, 8, and 9 present results where we use the most aggressive non-GAAP earnings metric to determine the number of exclusions used to calculate the exclusion quality score. We conduct two sets of analyses to investigate the sensitivity of our findings to this research design choice.

First, we exclude firms reporting both EBITDA and another non-GAAP metric (18.7% of our sample) and revisit our regression analyses. Since this alternative sample only involves firms with a single non-GAAP metric, we are confident that the reported non-GAAP metric is the one of focus for investors and management. Panel A of Table 10 indicates that our findings continue to hold using this alternative sample. We find that the exclusion quality score continues to be negatively associated with future regulatory outcomes and analyst forecast dispersion, and positively associated with the speed of price discovery.

Second, we keep our sample constant but adopt an alternative measurement of exclusion quality score for firms reporting both EBITDA and another metric. Specifically, we evaluate the non-GAAP exclusion quality based on the less aggressive non-GAAP metric. Adopting this approach does not impact calculations for firms reporting a single metric of non-GAAP earnings. Panel B of Table 10 reports the

[12] The fundamental economics of firms that lead to non-GAAP exclusions might also influence investors' and analysts' processing of non-GAAP exclusions, which works in a way against our results. For example, a firm could have a series of mergers and acquisitions that lead to a medium-high quality exclusion, but meanwhile the underlying mergers and acquisitions make the business more difficult to value and thus impede analysts' and investors' processing of earnings news.

regression results after we remeasure the exclusion quality score for firms reporting both EBITDA and another less aggressive metric. We find that our main results are largely consistent. The exclusion quality score is in the predicted direction for all five tests and significant in three of the five tests. Specifically, it is significantly negatively associated with future Regulation G violations and analyst forecast dispersion and positively associated with price discovery efficiency over the five-day window after the earnings announcement.

6. Conclusion

We show that there is an increasing trend in the number of non-GAAP exclusions reported by large U.S. firms. We find that the frequency and magnitude of recurring exclusions markedly exceed nonrecurring items, indicating that firms have considerable discretion in their non-GAAP adjustments. These trends in non-GAAP reporting suggest that investors and other users of financial statements are likely to have more difficulty understanding and interpreting the quality of non-GAAP exclusions used by many corporations.

We develop a rating system to evaluate the quality of exclusions that incorporates the views of the academic community, financial industry, and financial regulators. Our rating system provides a summary and diagnostic measure of non-GAAP exclusion quality that can aid users in processing financial information and help them understand the reasonableness of exclusions. In addition, we provide a conceptual framework for users that describes how exclusion quality can be assessed by considering the economic nature, accounting measurement, and valuation implications of individual exclusions. This framework can be employed to assess the quality of new exclusions that are not considered in our list of 22 exclusions.

Our non-GAAP exclusion quality score captures a unique dimension of non-GAAP reporting quality that is not explained by other measures of earnings quality, such as accruals or earnings persistence. Furthermore, we find that our score predicts SEC scrutiny, consistent with regulators also having quality concerns with the non-GAAP measures. We document that our measure of non-GAAP exclusion quality is

associated with analyst forecast dispersion and the speed of price discovery of earnings news, suggesting that non-GAAP exclusion quality influences both analysts' and investors' processing of non-GAAP earnings information.

We view the exclusion quality score as having practical usefulness to investors and analysts because it enables parsimonious comparison of firms that are excluding different items. The score could also be used as a screening tool for regulators or other market participants concerned with non-GAAP exclusion quality. Our score also opens opportunities for future research. For example, executive compensation contracts often include multiple financial-based performance metrics that exclude various items (e.g., restructuring charges) or are based on adjusted earnings or cash flow numbers. Future researchers could use our scoring system to examine the quality of these performance indicators and see whether it varies with the quality of the governance or the nature of the business. Another example of where our scoring system can be applied is the use of adjusted metrics, such as EBITDA or EBIT, in debt contracts. Does the quality of the exclusions reflect differences in the quality of GAAP earnings across various industries or are these exclusions the choices made opportunistically? The exclusion quality score could also be used as an additional metric in understanding reporting quality in a variety of contexts, such as its relation with the quality of sustainability reporting. We hope that future research will find our scoring approach useful for investigating these and many other topics.

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Exhibit 1
Rating system to evaluate the quality of non-GAAP exclusions

	Score	Quality	Exclusion	(1) Academic response	(2) Academic ranking	(3) Practitioner ranking	(4) Regulator ranking	(5) AR(1) ranking	(6) AR(1)
Low Quality	1	Low	*Rent and Lease Expense/Adjustments*	1.39	1			2	0.66
			Net Interest Expense	1.41	1			1	0.89
			R&D Expense	1.58	1			1	0.81
			Stock Compensation Expense	1.78	1	1		1	0.76
			Depreciation and Amortization	1.87	1	1		2	0.71
			Others (unidentified)						
	2	Medium Low	*Pension Expense/Adjustments*	2.26	2	2		1	0.83
			Executive Severance/Termination Costs	2.48	2				
			Realized Gains/Losses on Investment	2.57	2			3	0.15
			Inventory Write-Downs	2.61	2	2		4	0.14
	3	Neutral	*Tax Impact of Exclusions*	2.84	3				
			New Initiatives/Start-up Costs	2.86	3				
			Equity Income from Unconsolidated Subsidiaries	2.96	4			2	0.68
	4	Medium High	*Impairment on PP&E and Intangible Assets*	2.75	3	3	4.5	4	0.14
			Foreign Currency Gains/Losses	2.75	3	4		5	0.06
			Debt Extinguishment/Refinancing Costs	2.92	4		4.5	3	0.23
			Litigation/Settlement Costs	2.98	4	3		3	0.15
			Unrealized Fair Value Adjustments from Trading Securities	3.15	4	3	4.5	4	0.14
			Merger/Acquisition Costs	3.32	5	4	4.5	3	0.27
High Quality	5	High	*Gains/Losses on Sale of PP&E*	3.26	5	5	4.5	5	0.12
			Tax/Accounting Rule Changes	3.45	5		4.5		
			Restructuring Charges	3.54	5	4		5	0.12
			Discontinued Operations	3.58	5			5	0.08
Pearson correlation				0.93	0.96	0.94		0.84	−0.61

This exhibit presents our rating system to evaluate the quality of non-GAAP exclusions and its inputs. Our rating system provides a rating from 1 to 5 for the 22 identifiable exclusions from Audit Analytics for S&P 500 firms between 2013 and 2017. The exclusions are classified into five groups of exclusion quality based on their ratings, i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*. The inputs to our rating system include the academic ranking (Column 2), the practitioner ranking (Column 3), and the regulator ranking (Column 4), as well as the AR(1) ranking (Column 5). The bottom row reports the Pearson correlation between our rating system and its various inputs. Exclusions without inputs are left blank. Appendix 1 provides detailed discussions of our rating system.

Exhibit 2
Computation of non-GAAP exclusion quality score

This exhibit illustrates the calculation of exclusion quality score for two companies, Johnson & Johnson and Transdigm Group Inc. The exclusion quality scores of individual exclusions are defined in Exhibit 1.

Example 1: Johnson & Johnson's non-GAAP earnings as of fiscal year 2017.

Panel A: Reconciliation between non-GAAP and GAAP earnings.

(Source: https://www.sec.gov/Archives/edgar/data/200406/000020040618000003/a8k2017q4exhibit992o.htm)

(Dollars in Millions Except Per Share Data)	2017
Net Earnings/(Loss) - as reported	$ 1,300
Impact of tax legislation	13,556
Intangible asset amortization expense	2,481
Litigation expense, net	955
Actelion acquisition related cost	767
Restructuring/Other	595
In-process research and development	266
Diabetes asset impairment	4
AMO acquisition related cost	116
DePuy ASR™ Hip program	—
Other	—
Net Earnings - as adjusted	$ 20,040

Panel B: Non-GAAP exclusion quality score.

Exclusion	(1) Score	(2) Exclusion amount (millions)	(3) Absolute amount (millions)	(4) % of total absolute amount	(1) x (4) Weighted average score
Tax/Accounting Rule Changes	5	13,556	13,556	72%	3.62
Depreciation and Amortization	1	2,481	2,481	13%	0.13
Litigation/Settlement Costs	4	955	955	5%	0.20
Merger/Acquisition Costs	4	767	767	4%	0.16
Restructuring Charges	5	595	595	3%	0.16
R&D Expense	1	266	266	1%	0.01
Impairment on PP&E and Intangible Assets	4	4	4	0%	0.00
Merger/Acquisition Costs	4	116	116	1%	0.02
Total		18,740	18,740	100%	4.32

Exhibit 2 (continued)

Example 2: Transdigm Group Inc.'s non-GAAP earnings as of fiscal year 2017.

Panel C: Reconciliation between non-GAAP and GAAP earnings.

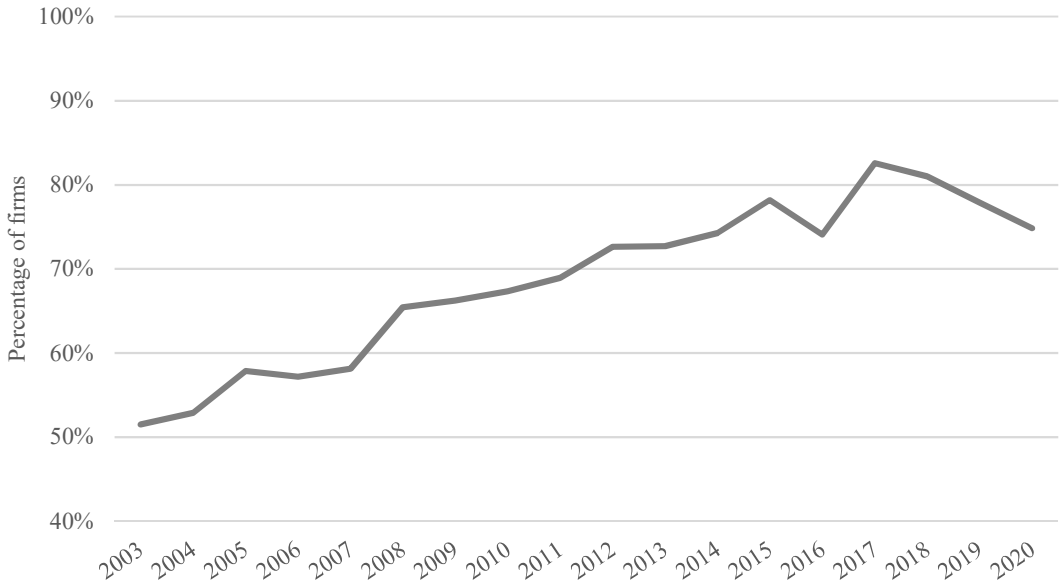
(Source: https://www.sec.gov/Archives/edgar/data/1260221/000126022117000057/a2017q4earningsrelease.htm)

	September 30, 2017
Net income	$ 596,887
Less: Loss from Discontinued Operations, net of tax	(31,654)
Income from Continuing Operations	628,541
Adjustments:	
Depreciation and amortization expense	141,025
Interest expense, net	602,589
Income tax provision	208,889
EBITDA	1,581,044
Adjustments:	
Acquisition-related expenses and adjustments (1)	31,191
Non-cash stock compensation expense (2)	45,524
Refinancing costs (3)	39,807
Other, net (4)	12,997
Gross Adjustments to EBITDA	129,519
EBITDA As Defined	$ 1,710,563

Panel D: Non-GAAP exclusion quality score.

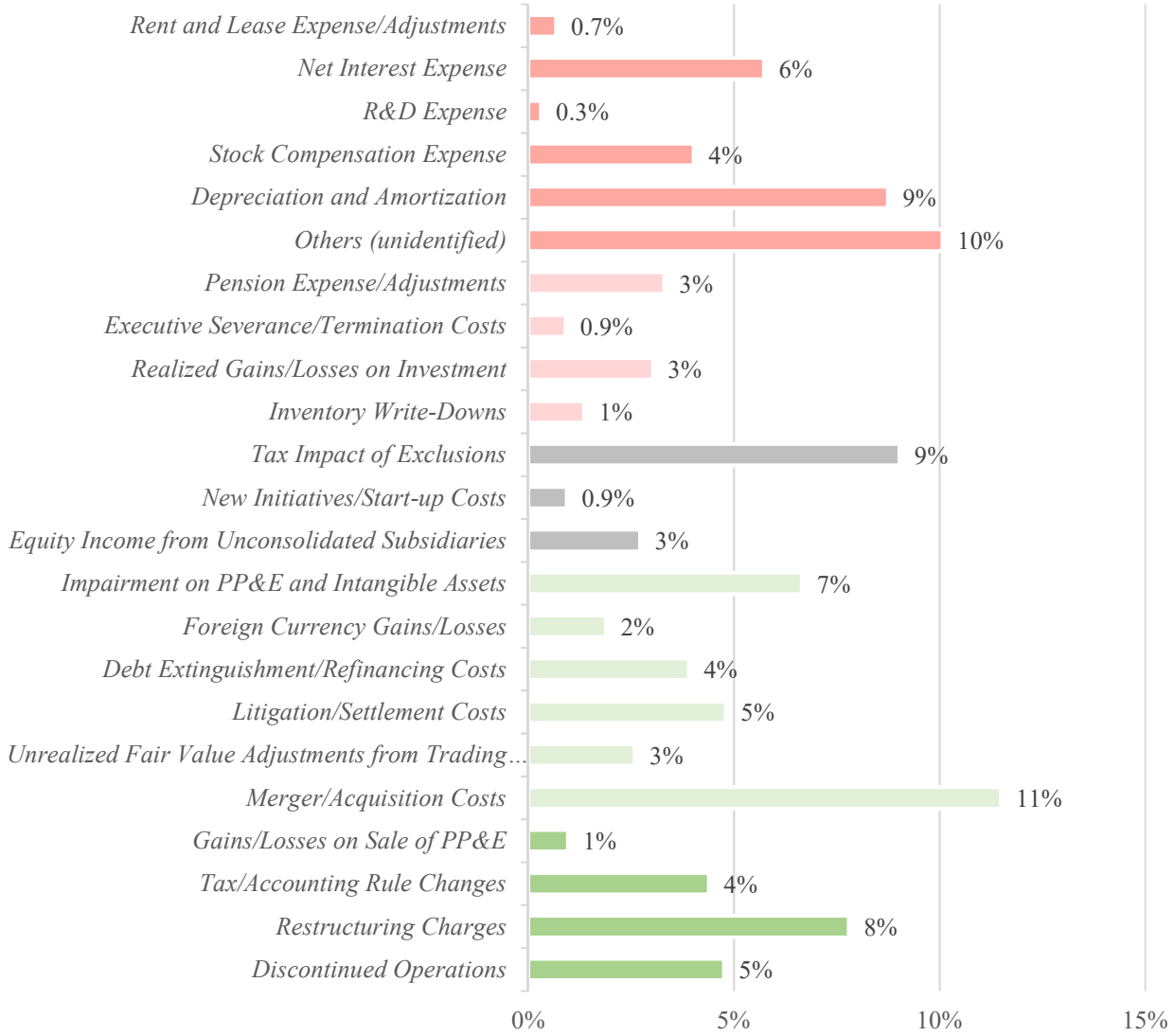
Exclusion	(1) Score	(2) Exclusion amount (millions)	(3) Absolute amount (millions)	(4) % of total absolute amount	(1) x (4) Weighted average score
Discontinued Operations	5	−31,654	31,654	3%	0.14
Depreciation and Amortization	1	141,025	141,025	13%	0.13
Net Interest Expense	1	602,589	602,589	54%	0.54
Tax Impact of Exclusions	3	208,889	208,889	19%	0.56
Merger/Acquisition Costs	4	31,191	31,191	3%	0.11
Stock Compensation Expense	1	45,524	45,524	4%	0.04
Debt Extinguishment/Refinancing Costs	4	39,807	39,807	4%	0.14
Others (unidentified)	1	12,997	12,997	1%	0.01
Total		1,050,368	1,113,676	100%	1.68

Figure 1
Non-GAAP reporting by S&P 500 firms over time



This figure plots the proportion of S&P 500 firms reporting non-GAAP EPS from 2003 to 2020 based on the latest data made available by Bentley et al. (2018). The sample includes firm-quarters in the intersection of Compustat, CRSP, and I/B/E/S and excludes finance, insurance, and real estate firms and firms with extraordinary items. Data Source: https://sites.google.com/view/kurthgee/data.

Figure 2
Distribution of non-GAAP exclusions



This figure presents the distribution of non-GAAP exclusions. Our sample includes 8,435 individual exclusions for 1,676 firm-year observations between 2013 and 2017. It depicts the frequency of each non-GAAP exclusion as a percentage of the total number of non-GAAP exclusions in our sample.

Figure 3
Income-increasing versus income-decreasing exclusions

Panel A: Number of income-increasing and income-decreasing exclusions.

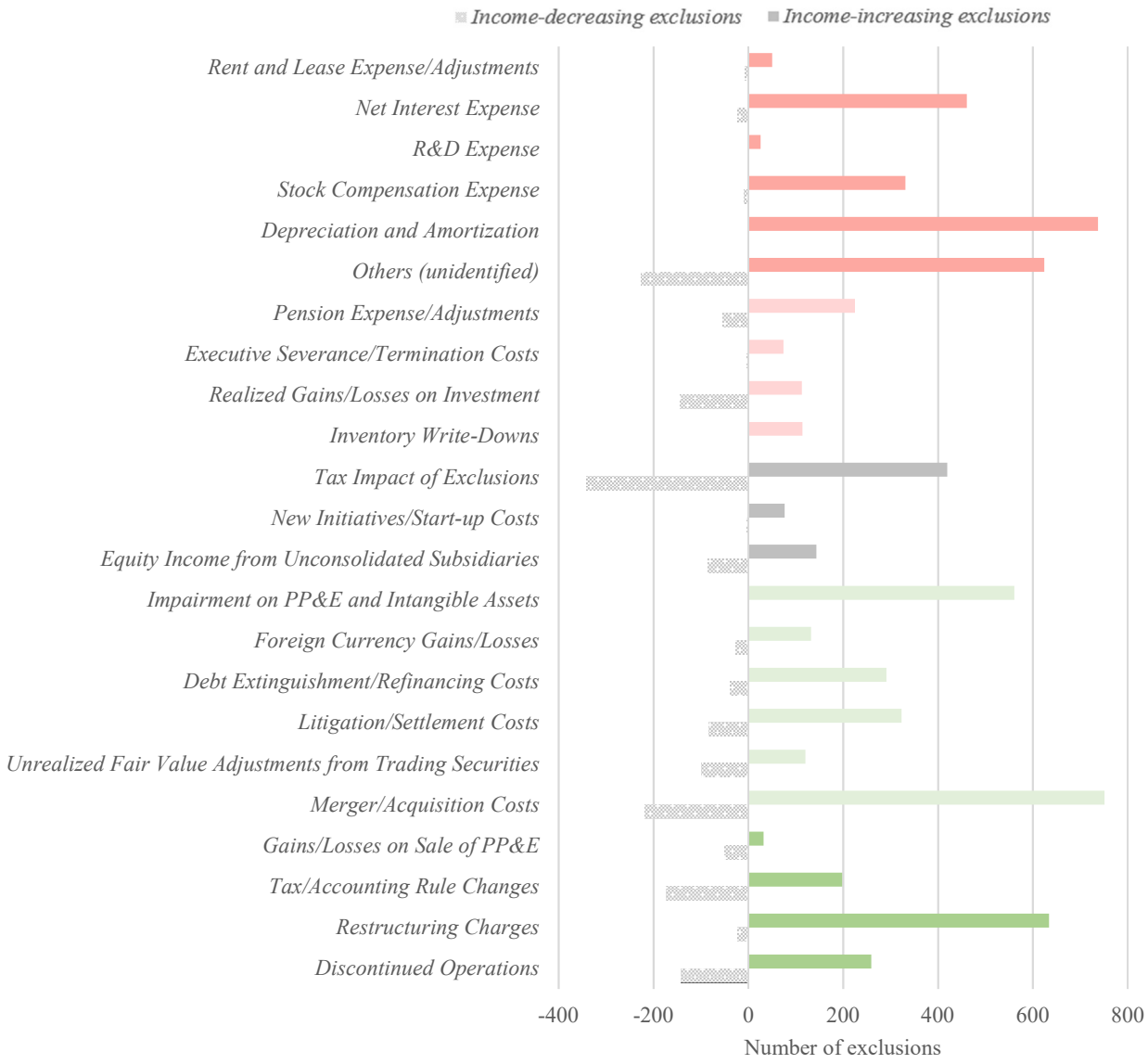
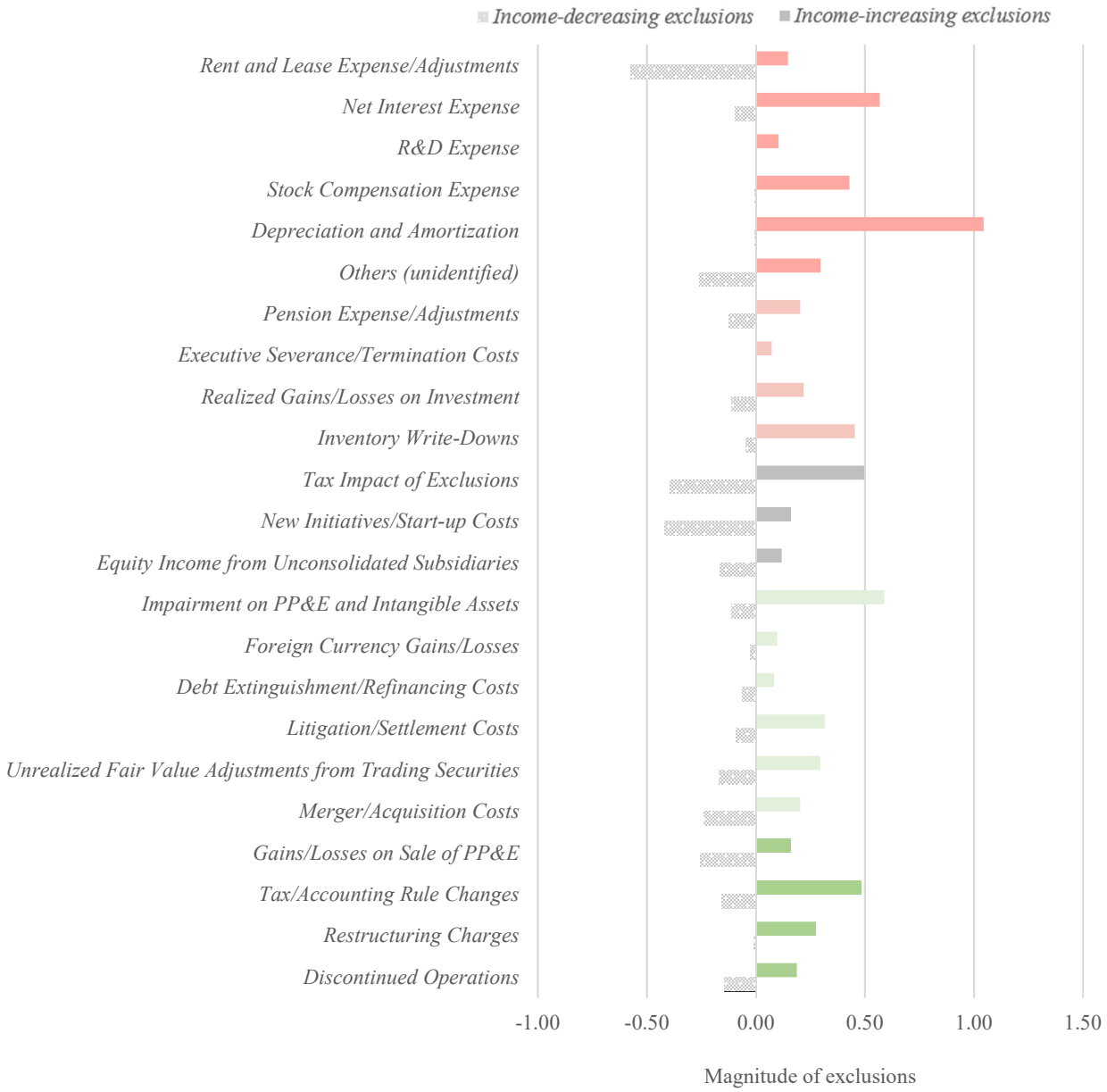


Figure 3 (continued)

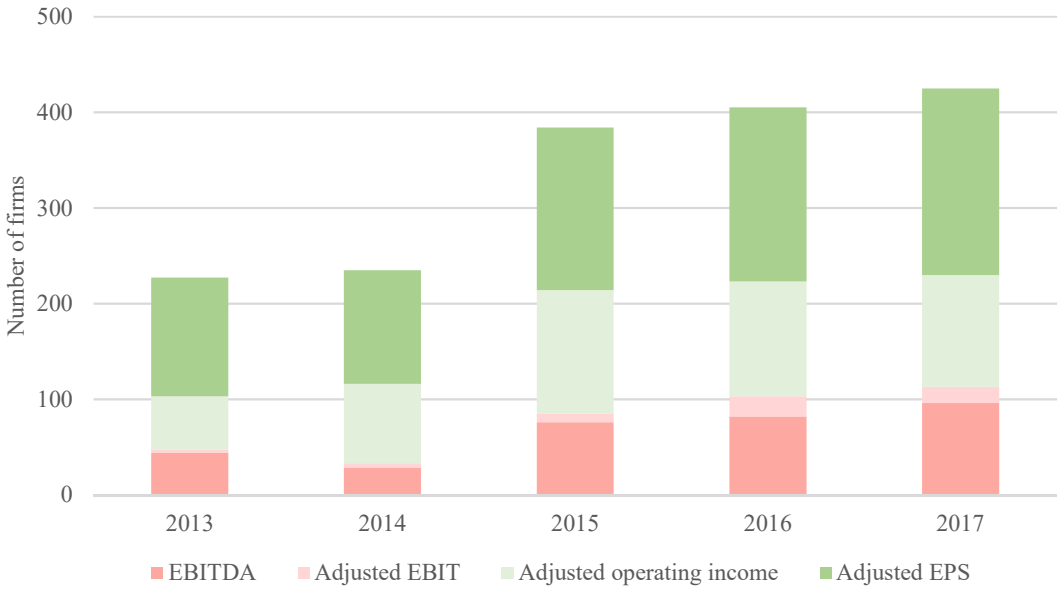
Panel B: Magnitude of income-increasing and income-decreasing exclusions.



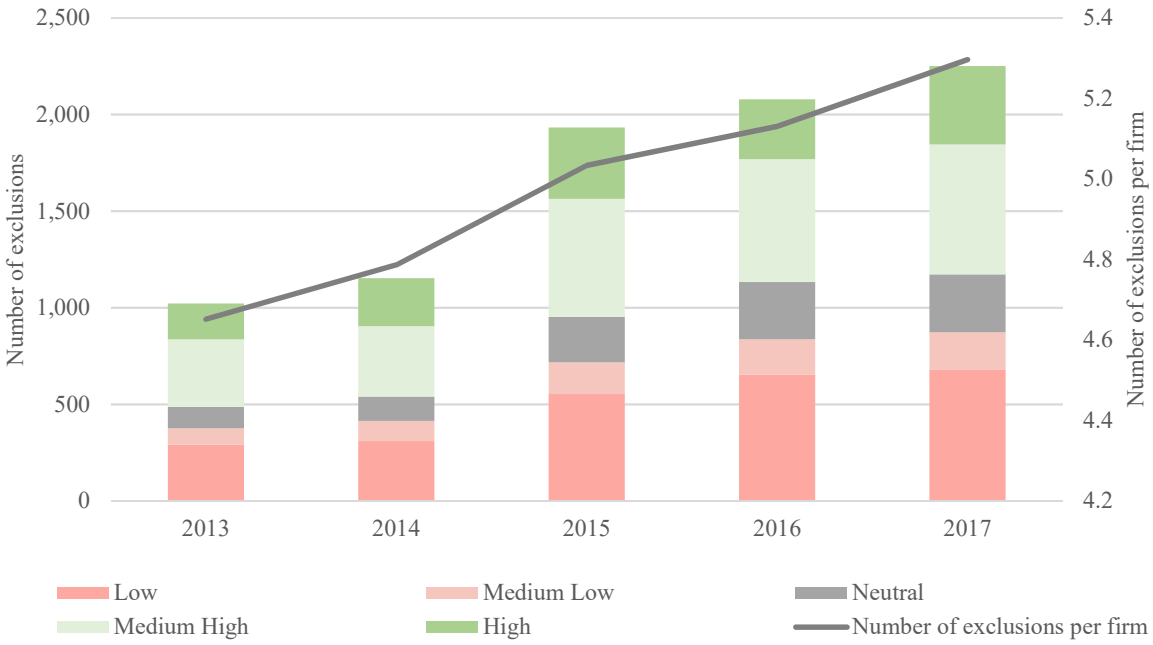
This figure presents the distribution of income-increasing and income-decreasing exclusions. Our sample includes 8,435 individual exclusions for 1,676 firm-year observations between 2013 and 2017. Panel A presents the number of income-decreasing and income-increasing exclusions. Panel B presents the average magnitude of income-decreasing and income-increasing exclusions. The magnitude of an exclusion is measured as the exclusion divided by the absolute value of GAAP earnings (net income).

Figure 4
Time-series pattern of non-GAAP reporting

Panel A: Number of firms by non-GAAP metric.



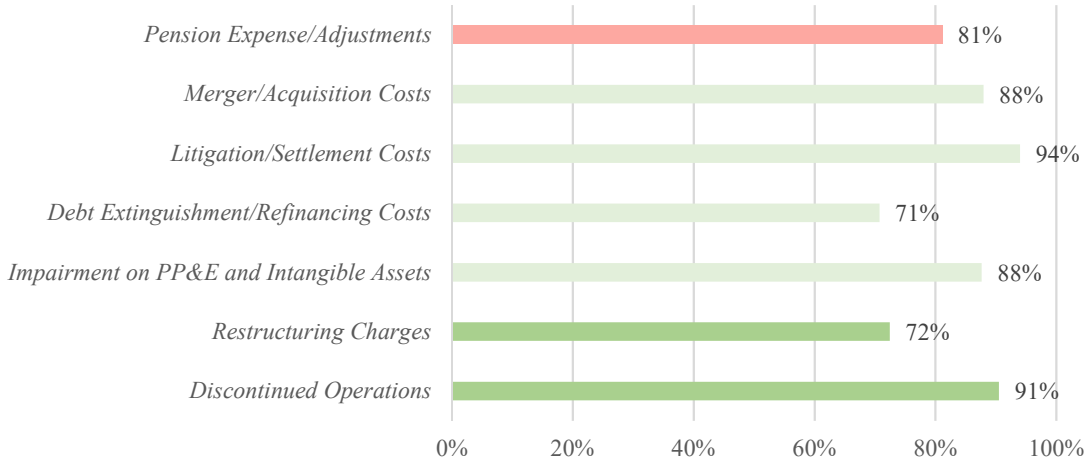
Panel B: Number of non-GAAP exclusions by quality and year.



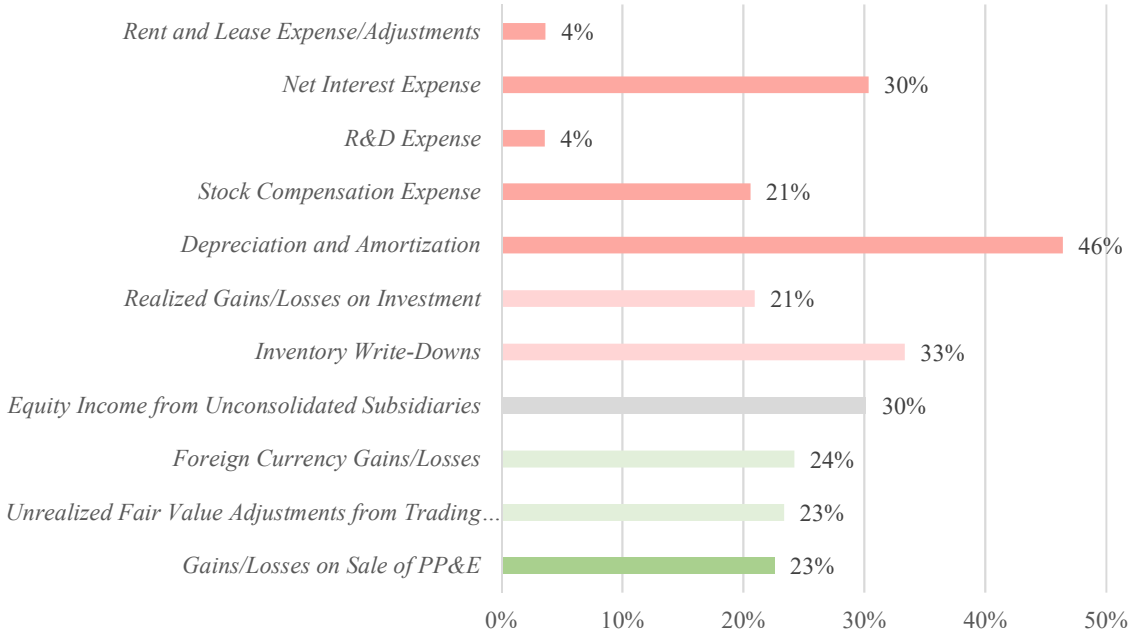
This figure presents the time-series pattern of non-GAAP reporting. Panel A plots the number of firms reporting different non-GAAP metrics. Panel B plots the number of non-GAAP exclusions by exclusion quality and year. Our sample includes 8,435 individual exclusions for 1,676 firm-year observations between 2013 and 2017.

Figure 5
Percentage of firms with individual non-GAAP exclusions

Panel A: Highly "acceptable" exclusions: percentage of firms excluding the item relative to those reporting the item (≥ 50%).



Panel B: Less "acceptable" exclusions: percentage of firms excluding the item relative to those reporting the item (< 50%).



This figure plots the percentage of firms with individual non-GAAP exclusions. Our sample includes 1,676 firm-year observations between 2013 and 2017. Panel A plots the percentage of firms excluding the item out of the number of firms reporting the item when it is higher than 50%. Panel B plots the percentage of firms excluding the item out of the number of firms reporting the item when it is lower than 50%.

Table 1
Summary statistics for exclusion quality score

Panel A: Summary statistics for the full sample.

Variables	N	Mean	Std Dev.	Percentiles		
				25th	50th	75th
Exclusion Quality Score	1,676	2.749	1.059	1.864	2.791	3.585
Number of Exclusions	1,676	5.033	2.645	3.000	5.000	7.000
Total Exclusion/GAAP	1,676	1.268	2.763	0.065	0.390	1.339

Panel B: Summary statistics by non-GAAP reporting choice.

Non-GAAP reporting choice	Firm-years		Number of Exclusions			*Exclusion Quality Score*
	N	Percent	Average	Total	Percent	
(1) Only report EBITDA	13	0.80	3.692	48	0.57	1.547
(2) Report both EBITDA and another non-GAAP metric	313	18.70	6.952	2,176	25.80	1.976
(3) Report a single non-GAAP metric other than EBITDA	1,350	80.50	4.601	6,211	73.63	2.941
(i) *Adjusted EBIT*	*55*	*3.30*	*6.927*	*381*	*4.52*	*2.038*
(ii) *Adjusted operating income*	*505*	*30.10*	*4.040*	*2,040*	*24.18*	*2.928*
(iii) *Adjusted EPS*	*790*	*47.10*	*4.797*	*3,790*	*44.93*	*3.014*
Total	1,676	100.00	5.033	8,435	100.00	2.749

This table presents descriptive statistics for our exclusion quality score. Our sample includes 8,435 individual exclusions for 1,676 firm-year observations between 2013 and 2017. Panel A reports summary statistics for the exclusion quality score and the total number and magnitude of non-GAAP exclusions at the firm-year level. Panel B reports the frequency of firms and their non-GAAP exclusions as well as the exclusion quality score by non-GAAP reporting choice. All variables are defined in Appendix 3.

Table 2
Distribution of non-GAAP exclusions

Exclusion	Full Sample *N* =1,676		EBITDA *N* =326		EBIT *N* =55		Operating income *N* =505		EPS *N* =790	
	Freq%	Value	Freq%	Value	Freq%	Value	Freq%	Value	Freq%	Value
Rent and Lease Expense/Adjustments	0.68	-0.366	0.49	0.196	1.57	0.082	0.59	-1.296	0.74	-0.036
Net Interest Expense	5.73	0.528	12.59	0.500	17.32	0.560	1.81	0.292	2.64	0.686
R&D Expense	0.31	0.104	0.09	0.224	0.00		0.20	0.071	0.53	0.080
Stock Compensation Expense	4.02	0.418	4.23	0.257	3.94	0.193	5.59	0.496	3.06	0.447
Depreciation and Amortization	8.74	1.034	14.43	1.263	9.71	1.430	7.45	0.921	5.99	0.984
Others (unidentified)	10.07	0.149	8.95	0.117	7.61	0.333	11.27	0.043	10.32	0.219
Pension Expense/Adjustments	3.31	0.085	1.80	0.082	2.36	0.079	5.10	0.082	3.32	0.090
Executive Severance/Termination Costs	0.90	0.070	0.58	0.043	0.79	0.046	0.98	0.198	1.06	0.004
Realized Gains/Losses on Investment	3.03	0.035	1.75	-0.075	2.62	0.017	2.16	0.201	4.30	-0.027
Inventory Write-Downs	1.35	0.371	0.72	0.143	1.57	0.055	2.25	0.757	1.21	0.242
Tax Impact of Exclusions	9.02	0.098	12.99	0.411	10.76	0.126	3.19	-0.015	9.66	0.039
New Initiatives/Start-up Costs	0.94	0.146	0.81	0.106	0.52	0.114	1.47	0.075	0.77	0.211
Equity Income from Unconsolidated Subsidiaries	2.71	0.013	3.55	0.061	4.46	-0.030	2.16	-0.130	2.35	0.077
Impairment on PP&E and Intangible Assets	6.65	0.480	5.53	0.737	6.82	0.279	7.01	0.322	7.10	0.487
Foreign Currency Gains/Losses	1.89	0.076	1.80	0.042	1.31	0.072	2.30	0.134	1.77	0.054
Debt Extinguishment/Refinancing Costs	3.90	0.066	3.82	0.042	3.41	0.221	2.21	0.025	4.91	0.089
Litigation/Settlement Costs	4.80	0.234	3.10	0.124	2.89	0.630	5.64	0.071	5.54	0.354
Unrealized Fair Value Adjustments from Trading Securities	2.58	0.087	2.16	0.023	0.79	0.234	1.47	0.032	3.61	0.139
Merger/Acquisition Costs	11.49	0.104	8.59	-0.074	7.61	0.176	13.97	-0.134	12.24	0.324
Gains/Losses on Sale of PP&E	0.96	-0.091	0.76	-0.164	1.84	-0.387	0.74	-0.014	1.11	-0.089
Tax/Accounting Rule Changes	4.39	0.185	1.35	0.253	1.05	-0.083	2.89	0.005	7.31	0.290
Restructuring Charges	7.79	0.172	4.99	0.158	4.46	0.107	12.65	0.162	7.15	0.189
Discontinued Operations	4.75	0.070	4.90	0.198	6.56	0.113	6.91	0.079	3.32	0.005

This table presents the distribution of individual non-GAAP exclusions for the full sample and the subsamples by different non-GAAP metrics reported by our sample firms. The frequency of exclusions is measured as a percentage of the total number of exclusions (Freq%) in the corresponding sample and the average magnitude is measured as the exclusion divided by the absolute value of GAAP earnings (Value). Our sample includes 8,435 individual exclusions for 1,676 firm-year observations between 2013 and 2017.

Table 3
Landscape of non-GAAP exclusions

Exclusion	(1) Number of firms excluding the item	(2) Number of firms reporting the item	(3) "**Acceptability**" % of firms excluding the item (1) / (2)	(4) "**Commonality**" % of firms reporting the item (2) / 1,676	(5) "**Prevalence**" % of firms excluding the item (1) / 1,676
Rent and Lease Expense/Adjustments	57	1,567	3.64	93.50	3.40
Net Interest Expense	483	1,591	30.36	94.93	28.82
R&D Expense	26	729	3.57	43.50	1.55
Stock Compensation Expense	339	1,647	20.58	98.27	20.23
Depreciation and Amortization	737	1,588	46.41	94.75	43.97
Others (unidentified)	849			0.00	50.66
Pension Expense/Adjustments	279	344	81.10	20.53	16.65
Executive Severance/Termination Costs	76				4.53
Realized Gains/Losses on Investment	256	1,223	20.93	72.97	15.27
Inventory Write-Downs	114	342	33.33	20.41	6.80
Tax Impact of Exclusions	761				45.41
New Initiatives/Start-up Costs	79				4.71
Equity Income from Unconsolidated Subsidiaries	229	759	30.17	45.29	13.66
Impairment on PP&E and Intangible Assets	561	640	87.66	38.19	33.47
Foreign Currency Gains/Losses	159	657	24.20	39.20	9.49
Debt Extinguishment/Refinancing Costs	329	465	70.75	27.74	19.63
Litigation/Settlement Costs	405	431	93.97	25.72	24.16
Unrealized Fair Value Adjustments from Trading Securities	218	933	23.37	55.67	13.01
Merger/Acquisition Costs	969	1,102	87.93	65.75	57.82
Gains/Losses on Sale of PP&E	81	359	22.56	21.42	4.83
Tax/Accounting Rule Changes	370				22.08
Restructuring Charges	657	907	72.44	54.12	39.20
Discontinued Operations	401	443	90.52	26.43	23.93

This table presents the number and percentage of firms excluding the items from non-GAAP earnings. Our sample includes 1,676 firm-year observations and 8,435 individual exclusions between 2013 and 2017. We identify firms excluding the item using Audit Analytics and firms reporting the item using Compustat. Column (2)−(4) are not available for exclusions without the corresponding Compustat values.

Table 4
Consistency of non-GAAP exclusion quality over time

Panel A: Persistence of non-GAAP exclusion quality.

		Current year exclusion quality (*N* =1,171 firm-year obs.)					
		Low	*Medium Low*	*Neutral*	*Medium High*	*High*	Total
Prior year exclusion quality	*Low*	**120**	10	50	16	32	228
	Medium Low	8	**134**	17	51	25	235
	Neutral	48	14	**90**	22	56	230
	Medium High	12	50	21	**98**	59	240
	High	28	25	61	54	**70**	238
	Total	216	233	239	241	242	1,171

Panel B: Correlation matrix for exclusion quality score and earnings persistence measures.

	(1)	(2)	(3)
(1) *Exclusion Quality Score*		0.100**	−0.156***
(2) Non-GAAP earnings persistence	0.063		0.021
(3) GAAP earnings persistence	−0.152***	0.039	

This table presents tests for the persistence of non-GAAP exclusion quality. Our sample includes 1,676 firm-year observations between 2013 and 2017, of which 1,171 firms have data for non-GAAP exclusions of two consecutive years. Panel A presents the distribution of firms by exclusion quality of the prior and current year. We sort firm-year observations into five groups (i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*) based on quintile ranks of exclusion quality scores by year. Panel B reports the Pearson (below the diagonal) and Spearman (above the diagonal) correlation coefficients among the exclusion quality score, non-GAAP earnings persistence, and GAAP earnings persistence. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 5
Non-GAAP exclusion quality by industry

	Industry	N	Avg. Quality Score	Std. Dev.	% of firms reporting adjusted			
					EBITDA	EBIT	Operating Income	EPS
Low Quality	Real Estate Investment Trusts	87	1.65	0.65	12.64	12.64	19.54	**55.17**
	Recreation	13	1.67	0.43	**84.62**	0.00	15.38	0.00
	Precious Metals and Mining	16	2.08	0.77	**75.00**	6.25	0.00	18.75
	Personal and Business Services	150	2.16	0.98	36.67	0.67	**42.67**	20.00
	Communication	65	2.46	1.01	21.54	6.15	**41.54**	30.77
	Beer and Liquor	12	2.61	1.17	33.33	8.33	**41.67**	16.67
	Aircraft, Ships, & Railroad Equip.	20	2.63	0.96	25.00	0.00	30.00	**45.00**
	Chemicals	38	2.72	0.95	**44.74**	7.89	23.68	23.68
	Transportation	41	2.73	0.99	14.63	0.00	34.15	**51.22**
	Healthcare and Medical Equip.	169	2.74	0.90	13.61	1.18	19.53	**65.68**
	Other	41	2.75	1.05	29.27	0.00	**41.46**	29.27
	Tobacco Products	16	2.76	0.62	31.25	0.00	**50.00**	18.75
	Electrical Equipment	10	2.76	1.13	0.00	0.00	**60.00**	40.00
	Construction and Materials	31	2.78	1.29	35.48	9.68	6.45	**48.39**
	Business Equipment	148	2.78	1.06	6.08	0.00	**50.68**	43.24
	Petroleum and Natural Gas	135	2.79	0.95	34.81	4.44	8.15	**52.59**
	Banking, Insurance, & Real Estate	229	2.90	0.93	10.48	0.00	22.27	**67.25**
	Retail	57	2.91	1.01	19.30	8.77	24.56	**47.37**
	Restaurants, Hotels, and Motels	18	2.94	0.91	22.22	0.00	**55.56**	22.22
	Automobiles and Trucks	23	3.01	0.86	4.35	4.35	30.43	**60.87**
	Utilities	133	3.12	1.02	10.53	5.26	10.53	**73.68**
	Food Products	53	3.22	0.99	13.21	3.77	**50.94**	32.08
	Fabricated Products & Machinery	53	3.23	1.18	15.09	1.89	**47.17**	35.85
	Apparel	21	3.29	1.36	19.05	9.52	**52.38**	19.05
	Consumer Goods	36	3.32	1.19	5.56	5.56	**69.44**	19.44
High Quality	Business Supplies and Containers	22	3.60	0.96	4.55	9.09	27.27	**59.09**
	Wholesale	29	3.61	1.08	6.90	3.45	**65.52**	24.14
	Average across industries:	61.70	2.79	0.98	23.33	4.03	34.85	37.79
	Full sample averages:	1,676	2.75	1.06	19.50	3.30	30.10	47.10

This table presents the distribution of exclusion quality scores (Avg. Quality Score) and non-GAAP reporting metrics (EBITDA, EBIT, operating income, and EPS) by Fama-French 30 industry for our sample firms. Our sample includes 1,676 firm-year observations between 2013 and 2017. We require at least ten observations for each industry. The shading is based on quintile sorting of the industry Avg. Quality Score.

Table 6
Firm determinants of non-GAAP exclusion quality

Panel A: Mean value of firm characteristics by exclusion quality.

	Low	Medium Low	Neutral	Medium High	High	Diff. High − Low	*t-stat.*
Non-GAAP Exclusions							
Exclusion Quality Score	1.342	2.018	2.750	3.382	4.270	2.928***	*120.00*
Number of Exclusions	5.158	6.204	5.611	5.234	3.586	−1.572***	*−8.53*
Total Exclusion/GAAP	1.972	1.737	0.737	1.103	0.758	−1.214***	*−6.70*
I(Non-GAAP > EBITDA)	0.427	0.423	0.163	0.084	0.033	−0.394***	*−13.60*
Firm Fundamentals							
Firm Size	9.750	9.975	10.236	10.149	10.033	0.283***	*3.08*
Firm Age	31.818	32.502	38.883	42.018	45.523	13.705***	*9.60*
Sales Growth	0.080	0.071	0.034	0.027	0.004	−0.076***	*−5.90*
ROA	0.053	0.059	0.053	0.048	0.046	−0.007	*−1.20*
I(Loss)	0.099	0.078	0.099	0.120	0.127	0.028	*1.16*
Leverage	0.326	0.289	0.263	0.265	0.254	−0.073***	*−5.57*
Cash from Operations	0.111	0.103	0.096	0.100	0.101	−0.010**	*−2.17*
Market Pressure							
Prior Stock Return	0.064	0.040	0.037	0.016	0.002	−0.062***	*−3.09*
Target Price Implied Ret	0.325	0.229	0.172	0.192	0.185	−0.141**	*−2.47*
Stock Compensation	0.335	0.363	0.315	0.314	0.304	−0.030	*−1.16*
Institutional Ownership	0.704	0.660	0.653	0.649	0.614	−0.090***	*−3.39*
Forward ETP	0.044	0.052	0.053	0.050	0.053	0.009***	4.21
Book to Market	0.360	0.426	0.460	0.480	0.439	0.079***	*2.89*
Ln(Analysts)	2.665	2.570	2.700	2.718	2.858	0.193***	*3.09*
Financial Reporting Quality							
FScore	1.011	1.089	1.054	0.994	1.025	0.014	*0.43*
Abs(Accruals)	0.062	0.061	0.060	0.060	0.056	−0.006	*−1.38*
Disc Accruals	−0.066	−0.012	0.015	−0.012	−0.019	0.047	*1.11*

Table 6 (continued)

Panel B: Multivariate analysis of firm determinants of non-GAAP exclusion quality.

	Pred. sign	*Dep Var = Exclusion Quality Score*			
		(1)	(2)	(3)	(4)
		Coefficient	*t-stat.*	Coefficient	*t-stat.*
Intercept		3.483***	*8.10*	3.198***	*7.19*
Non-GAAP Exclusions					
Total Exclusion/GAAP	−	−0.032***	*−3.37*	−0.026***	*−2.86*
I(Non-GAAP > EBITDA)	−	−0.934***	*−13.01*	−0.893***	*−12.52*
Firm Fundamentals					
Firm Size	+	−0.070*	*−1.91*	−0.036	*−0.91*
Firm Age	+	0.008***	*3.81*	0.004*	*1.73*
Sales Growth	−	−0.611***	*−3.90*	−0.697***	*−4.24*
ROA	+	−1.614***	*−2.96*	−1.343**	*−2.24*
Leverage	−	−0.389*	*−1.82*	−0.374	*−1.61*
Cash from Operations	?	0.668	*0.89*	0.841	*1.04*
Market Pressure					
Prior Stock Return	−	−0.222**	*−2.17*	−0.227**	*−2.22*
Target Price Implied Ret	−	−0.056	*−1.28*	0.013	*0.28*
Stock Compensation	−	−0.037	*−0.40*	0.011	*0.11*
Institutional Ownership	−	−0.178*	*−1.87*	−0.168*	*−1.73*
Forward ETP	+	−0.066	*−0.18*	−0.225	*−0.61*
Book to Market	?	0.089	*0.98*	0.017	*0.18*
Ln(Analysts)	+	0.031	*0.82*	0.008	*0.20*
Financial Reporting Quality					
FScore	?	0.116	*1.60*	0.207**	*2.35*
Abs(Accruals)	?	0.299	*0.67*	0.466	*1.06*
Disc Accruals	?	0.032	*0.52*	0.042	*0.81*
Industry fixed effects		No		Yes	
Year fixed effects		No		Yes	
Number of observations		1,329		1,329	
Adjusted R^2		24.90%		29.40%	

This table presents tests for the determinants of non-GAAP exclusion quality. Our sample includes 1,676 firm-year observations between 2013 and 2017. We sort firm-year observations into five groups (i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*) based on quintile ranks of exclusion quality scores by year. Panel A reports the mean values of each variable by exclusion quality and compares the difference between the *High* and *Low* exclusion quality. Panel B reports results from OLS regressions of exclusion quality score on firm characteristics. All regressions include controls and fixed effects as indicated. *t*-statistics in italics are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. All variables are defined in Appendix 3.

Table 7
Non-GAAP exclusion quality and future SEC scrutiny and enforcement

Panel A: SEC comment letters by topic

	Presentation & Prominence	Reconciliation	Exclusion Justification	EBITDA
Number of comment letters	97	81	54	27
Percentage of comment letters	56.73	47.37	31.58	15.79
Average exclusion quality score	2.691	2.630	2.407	2.324

Panel B: Regression results of SEC scrutiny on exclusion quality score

	Pred. sign	*Dep Var = Comment Letter*		*Dep Var = RegG Violation*	
		(1) Coefficient	(2) *z-stat.*	(3) Coefficient	(4) *z-stat.*
Intercept		−1.888	*−1.24*	−0.930	*−0.49*
Non-GAAP Exclusions					
Exclusion Quality Score	**−**	**−0.190****	***−2.19***	**−0.362*****	***−2.66***
Total Exclusion/GAAP		0.009	*0.37*	0.020	*0.56*
I(Non-GAAP > EBITDA)		0.002	*0.01*	0.360	*1.31*
Firm Fundamentals					
Firm Size		0.074	*0.59*	−0.084	*−0.51*
Firm Age		0.007	*0.97*	0.001	*0.04*
Sales Growth		0.396	*0.93*	−0.274	*−0.43*
ROA		−3.349**	*−2.49*	−1.851	*−1.22*
Leverage		0.186	*0.27*	−0.038	*−0.04*
Cash from Operations		−0.025	*−0.01*	0.670	*0.21*
Market Pressure					
Prior Stock Return		−0.136	*−0.54*	0.839**	*2.04*
TP Implied Ret		0.004	*0.03*	0.078	*0.52*
Stock Compensation		−0.482	*−1.57*	−0.669*	*−1.80*
Institutional Ownership		0.273	*0.85*	−0.293	*−0.79*
Forward ETP		1.476	*1.34*	1.421	*0.93*
Book to Market		−0.085	*−0.27*	0.665**	*2.29*
Ln(Analysts)		−0.062	*−0.45*	0.078	*0.39*
Financial reporting quality					
FScore		0.018	*0.07*	0.174	*0.53*
Abs(Accruals)		0.532	*0.44*	0.020	*0.01*
Disc Accruals		0.200	*1.38*	−0.055	*−0.29*
Industry fixed effects		Yes		Yes	
Year fixed effects		Yes		Yes	
Number of observations		1,329		1,329	
Pseudo R^2		7.03%		11.24%	

This table presents tests for the implication of non-GAAP exclusion quality for SEC scrutiny. Our sample includes 1,676 firm-year observations between 2013 and 2017, for which 171 comment letters are issued. Panel A reports the percentage of SEC comment letters that question firms' presentation, reconciliation, exclusion, and EBITDA for non-GAAP reporting. Panel B reports results from logistic regressions of SEC comment letters and Regulation G violations on non-GAAP exclusion quality score. All regressions include controls and fixed effects as indicated. *z*-statistics in italics are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. All variables are defined in Appendix 3.

Table 8
Non-GAAP exclusion quality and analyst forecast dispersion

	Pred. sign	*Dep Var = Forecast Dispersion*	
		(1) Coefficient	(2) *t-stat.*
Intercept		0.460*	*1.77*
Non-GAAP Exclusions			
Exclusion Quality Score	**−**	**−0.023****	***−2.20***
Total Exclusion/GAAP		−0.002	*−0.56*
Firm Fundamentals			
Firm Size		0.005	*0.36*
Firm Age		−0.001	*−0.86*
Sales Growth		0.035	*0.27*
ROA		−0.968*	*−1.88*
Leverage		0.257**	*2.59*
Cash from Operations		0.657*	*1.71*
StdDev Sales Growth		−0.006	*−0.49*
StdDev ROA		0.919**	*2.08*
StdDev CFO		0.978	*1.61*
Market Pressure			
Prior Stock Return		0.117**	*2.23*
TP Implied Ret		−0.013	*−0.49*
Stock Compensation		−0.091**	*−2.44*
Institutional Ownership		0.043	*1.32*
Forward ETP		−0.481	*−1.03*
Book to Market		0.181***	*2.81*
Ln(Analysts)		−0.023*	*−1.69*
Ln(Horizon)		−0.087**	*−2.45*
Financial reporting quality			
FScore		0.020	*0.55*
Abs(Accruals)		−0.122	*−0.66*
Disc Accruals		0.105	*1.62*
Industry fixed effects		Yes	
Year fixed effects		Yes	
Number of observations		1,312	
Adjusted R^2		14.60%	

This table presents results from OLS regressions of analyst forecast dispersion on non-GAAP exclusion quality score. Our sample includes 1,676 firm-year observations between 2013 and 2017. All regressions include controls and fixed effects as indicated. *t*-statistics in italics are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. All variables are defined in Appendix 3.

Table 9
Non-GAAP exclusion quality and investor response at earnings announcements

	Pred. sign	*Dep Var = IPE5*		*Dep Var = IPE10*	
		(1)	(2)	(3)	(4)
		Coefficient	*t-stat.*	Coefficient	*t-stat.*
Intercept		0.313**	*2.10*	0.303**	*2.23*
Non-GAAP Exclusions					
Exclusion Quality Score	+	**0.020****	***2.50***	**0.016****	***2.23***
Total Exclusion/GAAP		−0.004***	*−2.82*	−0.004***	*−2.70*
I(Non−GAAP > EBITDA)		−0.024	*−1.46*	−0.027**	*−2.17*
Firm Fundamentals					
Firm Size		0.003	*0.31*	0.007	*0.88*
Firm Age		0.001	*1.12*	0.001	*0.96*
Sales Growth		0.034	*0.45*	−0.059**	*−2.47*
ROA		0.066	*0.56*	0.114	*1.47*
Leverage		−0.117***	*−2.69*	−0.126***	*−3.22*
Cash from Operations		0.217	*1.34*	0.133	1.04
UE		0.013	*0.18*	−0.010	*−0.39*
Abs(UE)		0.064**	*1.99*	0.005**	*2.17*
Price per share		0.001	*0.61*	0.001	*0.70*
Market Pressure					
Prior Stock Return		−0.041	*−1.16*	−0.015	*−0.72*
TP Implied Ret		0.023**	*2.42*	0.016**	*2.10*
Stock Compensation		−0.017	*−0.57*	0.010	*0.57*
Institutional Ownership		0.002	*0.11*	0.005	*0.30*
Forward ETP		−0.236	*−1.04*	−0.230	*−1.26*
Book to Market		−0.056**	*−2.33*	−0.052**	*−2.43*
Ln(Analysts)		0.018	*1.15*	0.030**	*2.02*
Financial reporting quality					
FScore		0.025	*1.54*	0.021	*1.36*
Abs(Accruals)		−0.063	*−0.58*	−0.010	*−0.12*
Disc Accruals		0.001	*0.15*	0.002	*0.26*
Ln(Report Lag)		0.040	*1.39*	0.021	*0.90*
Guidance		−0.015	*−0.94*	−0.008	*−0.52*
Industry fixed effects		Yes		Yes	
Year fixed effects		Yes		Yes	
Number of observations		1,034		1,034	
Adjusted R^2		4.20%		5.80%	

This table presents results from OLS regressions of the speed of price discovery on non-GAAP exclusion quality score. Our sample includes 1,676 firm-year observations between 2013 and 2017. All regressions include controls and fixed effects as indicated. *t*-statistics in italics are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. All variables are defined in Appendix 3.

Table 10
Additional analyses for firms reporting both EBIDTA and another non-GAAP metric

Panel A: Excluding firms reporting both EBITDA and another non-GAAP metric.

	(1)	(2)	(3)	(4)	(5)
	Comment Letter	*RegG Violation*	*Forecast Dispersion*	*IPE5*	*IPE10*
Exclusion Quality Score	**−0.251****	**−0.309****	**−0.026****	**0.018****	**0.084***
	−2.21	***−0.17***	***−2.26***	***1.97***	***1.92***
Controls	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	1,091	1,091	1,068	860	860
Adjusted/Pseudo R^2	14.78%	14.44%	18.70%	5.80%	4.90%

Panel B: Remeasuring exclusion quality for firms reporting both EBITDA and another non-GAAP metric.

	(1)	(2)	(3)	(4)	(5)
	Comment Letter	*RegG Violation*	*Forecast Dispersion*	*IPE5*	*IPE10*
Exclusion Quality Score	**−0.117**	**−0.284****	**−0.018***	**0.016****	**0.032**
	−1.44	***−2.30***	***−1.85***	***2.16***	***0.83***
Controls	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	1,329	1,329	1,312	1,034	1,034
Adjusted/Pseudo R^2	6.55%	10.86%	18.00%	5.40%	3.90%

This table presents additional analyses for 313 firms (18.7% of the sample) reporting both EBITDA and another non-GAAP metric. Panel A reports regression results using an alternative sample excluding firms reporting both EBITDA and another non-GAAP metric. Panel B reports regression results using an alternative construct of exclusion quality score so that it is measured based on firms' less aggressive non-GAAP metric rather than EBITDA. All regressions include controls and fixed effects as indicated. *t*-statistics or *z*-statistics in italics are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. All variables are defined in Appendix 3.

Appendix 1
Conceptual framework to evaluate non-GAAP exclusions

This appendix discusses the economic nature, accounting measurement, and valuation implications of individual non-GAAP exclusions. We supplement these with perspectives from the academic community, financial industry, and regulators, as well as the first-order autocorrelation coefficients. By considering each of these factors, we classify exclusions into five groups by quality, i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*. For each exclusion, we discuss the following and refer to relevant empirical evidence.

Economic nature: Is the excluded item likely to recur? Is the excluded item part of a normal business activity that is necessary for generating revenue (i.e., a legitimate and normal expense), or is it a one-time business activity?

Accounting measurement: Does the accounting measurement rule induce transitory components in GAAP earnings? Do we have empirical evidence of serial correlation for the item?

Valuation implications: Is the excluded item relevant for forecasting future cash flows?

Low-Quality Exclusions
(Exclusion Quality Score = 1)

1. Rent and Lease Expense/Adjustments

1.1. Economic nature and valuation implications

Rent and lease expenses are part of core business operations and are relevant for valuation, given their implications for future cash flows. These expenses sometimes include one-off expenses related to lease termination.

1.2. Accounting measurement

Lease expenses that managers exclude typically reflect lease amortization. These items may not equal the cash outlays directly paid for the lease.

1.3. Summary

The academic score for this item is 1.39, consistent with its low-quality nature. Additionally, lease expenses are recurring with an AR(1) coefficient of 0.66. Overall, we consider this item a low-quality exclusion because it is part of ongoing operations. However, we note that one-off lease termination fees, which are different in nature from recurring rent or lease payments, may be more appropriate to exclude.

2. Net Interest Expense

2.1. Economic nature

Interest expense is determined by the outstanding balance of debt multiplied by the market interest rate at the time of debt issuance. It is allocated over the life of the debt. It is highly likely to recur in the future.

2.2. Valuation implications

Interest relates to a financing activity, not an operating activity. Therefore, it is not relevant for forecasting revenue generation. However, interest expenses are cash outflows, and therefore their exclusion from reported earnings is difficult to justify. If the firm continues to have debt financing and is not being valued as an acquisition target, then there is no justification for excluding this expense when valuing the firm.

2.3. Summary

The academic community perceives this exclusion to be of low quality with an academic score of 1.41. The AR(1) coefficient for interest expense is 0.89, consistent with the highly recurring nature of this item. Overall, we consider this item a low-quality exclusion because it is part of ongoing operations and is highly recurring.

3. R&D Expense

3.1. Economic nature

Firms invest in R&D to generate future revenue. Therefore, this item is highly likely to recur.

3.2. Accounting measurement

R&D is expensed. However, given the potential future benefits derived, there is some support for capitalizing instead of expensing it. However, if cash outlays for R&D are capitalized as an asset they should then be amortized over the period that firms expect to benefit from that asset.

3.3. Valuation implications

Even though R&D could be capitalized as an asset and then amortized, the decision to exclude R&D costs ignores the fact that this is a real cash outlay that needs to be recouped when determining valuation. The decision to expense R&D is likely to have minimal effect on a firm in steady state since the rate of amortization and the cash outlay will be similar. Additionally, in steady state, the firm is consistently earning revenue from prior R&D projects, compensating for the lack of revenue generated from the current R&D. However, for a growing firm, there is less balance between revenue generated from past R&D and expenses incurred from current R&D. For these growth firms, on the one hand, current R&D results only in losses, even though there is potential future benefit, justifying exclusion from reported income. On the other hand, there is also more uncertainty regarding the future benefit, justifying inclusion in reported income. Therefore, overall, there is some ambiguity around whether exclusion of R&D expense is justifiable based on its asset-like characteristics. However, even when R&D expenses are more justifiable to exclude, they reflect cash outlays that should be recognized over a future period where firms expect to benefit from them.

3.4. Empirical Evidence

Lev and Sougiannis (1996) find that R&D expense is value relevant to investors and document an association between R&D and future stock returns. Kothari et al. (2002) find that R&D expense is associated with a higher standard deviation of five-year-ahead earnings, consistent with the uncertainty of benefits derived from R&D expense. More recently, Curtis et al. (2020) document a decline in the association between current R&D expense and future profits over time as well as the uncertainty of those profits.

3.5. Summary

The academic score for this item is 1.58, consistent with our view that this exclusion is of low quality. Additionally, R&D has high serial correlation, with an AR(1) coefficient of 0.81. Given its recurring nature and that firms should recognize the costs associated with future benefits derived, we view R&D expense as a low-quality exclusion.

4. Stock Compensation Expense

4.1. Economic nature

Stock compensation is payment of stock or options to employees that usually require the employee to remain at the firm and work for a length of time. They do not involve payments of cash but shares that have an uncertain value at the time that they are issued to the employee. The objective of using stock is to encourage workers to work harder because they now have a vested interest in the firm's success. Overall, stock compensation expense is incurred as part of firms' business operation costs in exchange for employees' services.

4.2. Accounting measurement

There are various types of stock compensation, but this expense is generally for employee stock compensation plans, where the employee is given stock options or restricted stock and earns them over a vesting period (with the calculated value of the award being allocated as an expense over time). The employee may have to pay to buy the stock in cash (in the case of options) or may be given a real stock or a stock equivalent payout.

4.3. Valuation implications and Empirical Evidence

Mohanram et al. (2020) provide evidence supporting overvaluation of firms with higher stock-based compensation. Their results indicate that failure to account for stock-based compensation as an expense leads to the overvaluation of a firm's equity.

Barth et al. (2012) find that the likelihood of exclusion of stock-based compensation is higher for firms with a larger expense and firms that beat expectations in the prior year when including the expense would have caused a loss in that prior year. They interpret their results as suggesting that firms opportunistically exclude stock-based compensation.

Black and Christensen (2009) find that stock-based compensation expense is positively associated with the likelihood of turning a GAAP loss into a non-GAAP profit or a GAAP miss to a non-GAAP beat, which suggests that managers may exclude the expense opportunistically.

Given that prior findings support the idea that exclusions of stock-based compensation result in overvaluation and stock-based compensation may be excluded for opportunistic reasons, we view stock compensation expense as a low-quality exclusion. Additionally, excluding stock-based compensation would be of extremely low quality when the tax benefit of stock compensation is not excluded, given inconsistent treatment of gains and losses.

4.4. Summary

Academics rate this exclusion 1.78, which indicates a low-quality exclusion. The AR(1) coefficient is 0.76, consistent with stock-based compensation being a persistent expense. Additionally, the CFA Institute (2016) views the exclusion of stock compensation as misleading to investors, since it does not recognize the costs incurred by firms in exchange for employee's services. Most of its member survey respondents (55.4%) consider this exclusion inappropriate. Considering all the factors above, particularly that excluding stock compensation completely could result in misleading firm valuation, we rate this expense as a low-quality exclusion.

5. Depreciation and Amortization

5.1. Economic nature

Depreciation reflects the capital expenditures for PP&E and amortization reflects payments for intangible assets recognized from past acquisitions.

5.2. Accounting measurement

The item is an allocation of the cost of an asset over time. The measurement rule does not introduce transitory components, and this item is likely to have high serial correlation.

5.3. Valuation implications

This item is noncash but, if it is excluded, then the original expenditures should be included in forecasts since capital expenditures are required to generate future revenue.

5.4. Empirical evidence

Black and Christensen (2009) find that depreciation is positively associated with the likelihood of turning a GAAP loss into a non-GAAP profit or a GAAP miss to a non-GAAP beat, suggesting that depreciation exclusions may be opportunistic. Whipple (2015) finds that amortization is negatively associated with future operating earnings.

5.5. Summary

The academic rating for depreciation and amortization is 1.87, which suggests that this exclusion is low quality. The CFA institute's (2016) view is that depreciation should not be ignored just because it is a noncash charge and the economic consumption of acquired intangible assets should still be estimated by financial statement preparers, even if they decide to exclude amortization completely. Most of its member survey respondents consider this exclusion inappropriate (35.4%) as opposed to appropriate (33.2%) or sometimes appropriate/inappropriate (26.6%). The AR(1) coefficient for depreciation and amortization is 0.71, consistent with its highly recurring nature. Overall, we consider this item a low-quality exclusion because it is part of ongoing operations and is a capital expenditure that should be recognized as part of earnings.

Medium-Low-Quality Exclusions

(Exclusion Quality Score = 2)

6. Pension Expense/Adjustments

6.1. Economic nature

Pension expenses are part of core business payments to employees and are likely to recur.

6.2. Accounting measurement

The scope of accounting rules for pension expenses generally covers pension expenses incurred each year relating to employee's earned pension. It also involves the amortization of the prior service costs and gains and losses on plan assets and pension obligations. Thus, the accounting measurement can induce transitory components into earnings.

6.3. Valuation implications

Recurring pension expenses are value-relevant since they are part of core business expenses. However, nonrecurring pension-related items, such as corridor adjustments, introduce some ambiguity in value-relevance relative to other components of income.

6.4. Summary

The academic rating for this item is 2.26. The CFA institute (2016) argues that, despite the volatility, pension re-measurements have information content on risks associated with pension plans and are value-relevant, and thus matter to investors. More of its survey respondents consider it inappropriate (22.4%) rather than appropriate (18.6%) to exclude re-measurements. This item has a high AR(1) coefficient (0.83). Overall, we consider this item a medium-low-quality exclusion because it is part of core business payments, but we note that it can sometimes include transitory components.

7. Executive Severance/Termination Costs

7.1. Economic nature

This item relates to payouts to executives whose employment has been terminated, usually when there is an acquisition or a division is closed. They are less likely to recur.

7.2. Valuation implications

They are relevant for forecasting cash flows, especially for firms that do recurring acquisitions.

7.3. Summary

The academic rating for this item is 2.48. We view executive severance or termination costs as a medium-low-quality exclusion since it reflects a real cash outflow that should be accounted for. We note that it is less recurrent in nature for most firms, but the appropriateness of its exclusion from reported earnings depends on firm-specific factors, such as how often the firm has acquisitions.

8. Realized Gains/Losses on Investment

8.1. Accounting measurement

Realized gains/losses on investment securities differ from unrealized gains/losses due to fair value adjustments because these gains or losses are realized and could be more value relevant.

8.2. Summary

The academic rating for this item is 2.57. The AR(1) coefficient is 0.15, consistent with this item being transitory and therefore having little implication for the future performance of the firm. We classify this item as a medium-low-quality exclusion since it is a realized gain or loss that should be accounted for, while noting that it is transitory.

9. Inventory Write-Downs

9.1. Economic nature

Inventory is necessary for core operations, allowing a firm to sell and generate revenue. Therefore, costs related to inventory are part of the core business.

9.2. Accounting measurement

From a balance sheet perspective, the goal of inventory write-downs is to correct the inventory balance down to its market value. Inventory write-downs are common and recurring for some industries (e.g., retail firms markdown inventory to encourage sales). From an income statement perspective, managers should have to match the inventory costs to the lower revenues generated and show lower profit margins. Specifically, if managers sell inventory at low costs, any profit margin losses should be communicated to investors through poorer performance metrics and should not be excluded from GAAP earnings.

Overall, the accounting for inventory induces large transitory components in earnings when inventory is written down. A more appropriate approach from an income statement perspective would be to continue to allocate these costs to the associated revenue generated by the marked-down inventory at the time of sale and have a timely note disclosure regarding the inventory affected, or even separate it out as a line item on the balance sheet that is removed once the inventory is sold or discarded.

9.3. Summary

The academic rating for this item is 2.61. The CFA institute (2016) recommends that investors do not ignore patterns of inventory write-downs, as they can signal earnings management and may communicate information on product obsolescence. More of its survey respondents consider write-downs inappropriate (32.2%) rather than appropriate (20%) to exclude. These charges have relatively low persistence, with an AR(1) coefficient of 0.14. We consider inventory write-downs as a medium-low-quality exclusion since they are part of core business operations, and the reduced profit margin for the written-down inventory should be accounted for. However, we note that they are a largely transitory item.

Neutral-Quality Exclusions
(Exclusion Quality Score = 3)

10. Tax Impact of Exclusions

10.1. Accounting measurement

This item relates to the tax impact of different non-GAAP exclusions with varying qualities. It is less likely to be opportunistic since, in most cases, this is an income-decreasing exclusion that hurts non-GAAP earnings. It is not a standalone expense and is usually reported to reconcile another item to after-tax net income.

10.2. Summary

The academic rating for this item is 2.84, which is close to a neutral view on the quality of this exclusion. We also consider tax impact of exclusions as a neutral-quality exclusion because it is a mixed item generated by other non-GAAP exclusions.

11. New Initiatives/Start-up Costs

11.1. Accounting measurement

From an income statement perspective, these are costs incurred to obtain a future benefit and should be capitalized and amortized over some period. However, from a balance sheet perspective, these costs are not in themselves a tangible or intangible asset and have no future benefit, justifying the requirement for firms to expense them. These costs are most likely transitory and one-off in nature.

11.2. Summary

The academic rating for this item is 2.86, consistent with a neutral view on the quality of this exclusion. We similarly consider new initiatives and start-up costs as a neutral-quality exclusion, given the ambiguity over the future benefit derived from these costs.

12. Equity Income from Unconsolidated Subsidiaries

12.1. Accounting measurement

This item reflects firms' share income or loss in unconsolidated investees. It is often a gain and therefore is less likely to be an opportunistic exclusion.

12.2. Summary

The academic rating for this item is 2.96, consistent with a neutral view on the quality of this exclusion. This item is highly persistent with an AR(1) coefficient of 0.68. We view equity income from unconsolidated subsidiaries as a neutral-quality exclusion by considering both its persistence but less-opportunistic nature.

Medium-High-Quality Exclusions

(Exclusion Quality Score = 4)

13. Impairment on PP&E and Intangible Assets

13.1. Economic Nature

Impairment is recognized when the market value of the asset is lower than its value on the balance sheet or it becomes clear that the company is not generating enough revenue to cover the cost of the PP&E or intangible assets. For goodwill, impairments are often attributable to acquired businesses that do not do as well as managers hope for.

13.2. Accounting measurement

When the expected future cash flows are below what the cost of the asset is recorded on the books, then the difference is written off in the income statement to correct the balance sheet amounts. This difference often arises because managers did not promptly depreciate or amortize the asset. The accounting is asymmetrically conservative since managers cannot offset impairments against assets that have had gains (risen in value). Impairment charges are negative and induce transitory components into income.

Impairments that are ignored potentially result in inflated future return on assets when revenue is earned from the asset but there is no associated amortization cost.

Goodwill impairments are a bit more ambiguous. On the one hand, if a firm's stock is overvalued, and managers use it to acquire other companies, the amount of goodwill write-off could reflect this overvaluation. However, when the acquirer pays cash, then this cash could have been used for other purposes, and any goodwill write-off reflects a recognition of a prior cash outlay.

13.3. Empirical evidence

Riedl (2004) finds that write-offs of long-lived assets have decreased in quality, in that they are less associated with economic factors and are more likely to reflect opportunistic reporting.

Li and Sloan (2017) find evidence of inflated goodwill balances and untimely impairments in recent years. Their results suggest that managers exploit the discretion allowed by SFAS142 by delaying goodwill impairments. Ramanna and Watts (2012) find that goodwill non-impairment is positively associated with CEO tenure and a firm's flexibility in fair value accounting. Their results suggest that manager incentives have some influence over goodwill impairment.

Earlier research by Hayn and Hughes (2006) also finds that goodwill impairment typically lags the economic impairment of goodwill by an average of three to four years. They find that managers are more likely to overpay in stock-based acquisition deals (as opposed to cash-based deals), resulting in a higher likelihood of future goodwill impairment. Overall, empirical findings seem to suggest that impairments may be subject to managerial opportunism and are not timely, compromising their value-relevance.

13.4. Summary

Impairments have an academic rating of 2.75. The CFA Institute (2016) recommends that, despite their irregular occurrence, PPE and intangible asset impairments should be analyzed by investors since they can provide information about deteriorating economic circumstances, which is value relevant. However, more of its member survey respondents consider this item appropriate (34%) rather than inappropriate (16.3%) to exclude. The CSRC considers it as an extraordinary item, supporting its exclusion from recurring earnings. We find that impairments have a low AR(1) correlation of 0.14, suggesting that they have a more transitory nature. Given this transitory nature and the factors discussed above, we view this item as a medium-high-quality exclusion.

14. Foreign Currency Gains/Losses

14.1. Economic nature

These gains and losses have to do with assets or liabilities being in foreign countries and subject to exchange rate fluctuations.

14.2. Accounting measurement

This exclusion involves the realized foreign currency gains and losses that occur when there is a disposition of foreign assets or through other exposures to foreign currency fluctuations.

14.3. Summary

The academic rating for foreign currency gains and losses is 2.75. The CFA institute (2016) notes that excluding this item is understandable if the foreign currency exposure is associated to investing, lending, or borrowing activities, but is less justifiable if it relates to operating activities. More of its member survey respondents consider this item appropriate (24.4%) rather than inappropriate (21.5%) to exclude. The CSRC considers this item an extraordinary item, supporting its exclusion from recurring earnings. We find that the AR(1) coefficient is only 0.06, which reflects the nonpersistent nature of such items. We view that, in many cases, these gains and losses are likely to have minimal impact on the firm's future core performance. They are also typically transitory and have low variance. However, we recognize that this may not hold for all firms. We therefore classify foreign currency gains and losses as a medium-high-quality exclusion.

15. Debt Extinguishment/Refinancing Costs

15.1. Economic nature

These costs are likely to vary, depending on the type and terms of financing used by the firm. Extinguishments occur when the firm puts the debt in an irrevocable trust. Refinancing costs are incurred when the firm pays off one loan and refinances the asset with another loan. They relate to a financing decision and not an operating decision. Therefore, we do not consider them part of core operating earnings. Whether this item is recurring or nonrecurring depends on the business and debt strategy of the firm, but it is generally less likely to recur.

15.2. Summary

The academic rating for this item is 2.92. The CSRC considers this item an extraordinary item, supporting its exclusion from recurring earnings. The AR(1) coefficient of 0.23 suggests that this is not a highly recurring item. Considering all the above factors, we classify debt extinguishment and refinancing costs as a medium-high-quality exclusion.

16. Litigation/Settlement Costs

16.1. Accounting measurement

Accounting rules require companies to be able to estimate the value of the obligation reliably and assess the likelihood of realizing that obligation as more probable than not, before recognizing litigation as a liability. Thus, there is a delayed recognition of gains or losses from litigation. These amounts are also likely to be transitory.

16.2. Summary

The academic rating for this item is 2.98, supporting a medium-high view on the quality of this exclusion. The CFA Institute (2016) notes that exclusions of legal costs are questionable when they are recurrent. More of its member survey respondents find this item inappropriate (30.5%) rather than appropriate (17.5%) to exclude. However, we find that legal costs are generally nonrecurring with an AR(1) coefficient of 0.15. Taken together, we view litigation and settlement costs as a medium-high-quality exclusion since it is largely transitory and likely have minimal impact on valuation.

17. Unrealized Fair Value Adjustments from Trading Securities

17.1. Accounting measurement

Whether the firm reports an unrealized gain or loss depends on market conditions, making this item highly variable. Inclusion of these adjustments in earnings is based on a balance sheet perspective (revaluing marketable securities to market), but it introduces noise into earnings since the gains and losses are unrealized. Therefore, it can be reasonable for management to provide a measure of core earnings that excludes them.

17.2. Valuation implications

They are unlikely to be useful for forecasting firm performance. These adjustments depend on prevailing market conditions and do not reflect future market conditions. They are more relevant in asset management, where the business is trading securities that are considered as operating assets.

17.3. Summary

The academic rating for this item is 3.15, supporting a high-quality view on the nature of this exclusion. The CFA Institute (2016) notes that, while fair value measurement is value relevant, the appropriateness and application of the associated accounting standards are questioned and opposed by some stakeholders. More of its member survey respondents consider this item appropriate (24.2%) rather than inappropriate (17.9%) to exclude. The CSRC considers this item an extraordinary item, supporting its exclusion from recurring earnings. The AR(1) coefficient is 0.14, consistent with this item being transitory. Taken together, we classify this item as a medium-high-quality exclusion since it is highly variable and has little implication for valuation.

18. Merger/Acquisition Costs

18.1. Economic nature

Merger and acquisition costs arise from integrating a new business into the firm's core business.

18.2. Accounting measurement

From an income statement perspective, they are costs incurred to obtain a future benefit and should be capitalized and amortized, with the amortization costs being reflected in GAAP earnings. However, from a balance sheet perspective, these costs are not in themselves a tangible or intangible asset and have no direct future benefit, and therefore they can be viewed as one-off costs that firms must pay to buy the business. When firms continually engage in acquisitions, the one-off argument for exclusion is not appropriate.

18.3. Summary

The academic rating for this item is 3.15, supporting a high-quality view on the nature of this exclusion. The CFA Institute (2016) notes that it is generally inappropriate to exclude this item when acquisitions recur. However, its member survey results show that 30% of respondents consider it usually appropriate to exclude the item, versus 21.4% who consider it inappropriate. The CSRC considers this item an extraordinary item, supporting its exclusion from recurring earnings. We find that acquisition cost has an AR(1) coefficient of 0.27. We classify this item as a medium-high-quality exclusion, given its less recurrent nature, while recognizing that firms should recognize costs associated with future benefits derived from the acquisition.

High-Quality Exclusions

(Exclusion Quality Score = 5)

19. Gains/Losses on Sale of PP&E

19.1. Accounting measurement

Gains and losses on sale of PP&E arise when proceeds of the disposal of assets differ from the carrying value of the assets at the time of sale. Gains and losses on sale of PP&E often depend on property prices at the time of sale, which are unpredictable.

19.2. Valuation implications

Since the property has been sold, it has no future implications for the firm, thus justifying exclusion from GAAP earnings.

19.3. Summary

The academic rating for this item is 3.26, supporting a high-quality view on the nature of this exclusion. Most of the CFA Institute's member survey respondents (56.3%) consider this item to be appropriate to exclude. The CSRC considers this item an extraordinary item, supporting its exclusion from recurring earnings. The AR(1) coefficient is low (0.12), consistent with gains or losses being transitory. Overall, we view gains and losses on sale of PP&E as a high-quality exclusion, given its low persistence and limited impact on valuation.

20. Tax/Accounting Rule Changes

20.1. Economic nature

This item relates to regulatory-related adjustments, such as accounting adjustments from FASB standard changes or adjustments resulting from the tax act. The adjustments are generally not associated with core operations or business, but the regulatory changes sometimes impact firms' economics or income.

20.2. Accounting measurement

These items arise because of changes in accounting standards, tax rules, or regulations and are likely to be transitory.

20.3. Summary

The academic rating, with a score of 3.45, suggests that it is a high-quality exclusion. The CSRC views this item as an extraordinary item, supporting its exclusion from recurring earnings. We share the same view that unusual and one-time tax charges or other accounting rule change-related charges are a high-quality exclusion.

21. Restructuring Charges

21.1. Economic nature

Firms incur restructuring charges when reorganizing their operations. These charges often include severance packages and write-downs of assets.

21.2. Accounting measurement

The accounting for restructuring charges has evolved. Initially, firms could classify various costs into restructuring charges (including ongoing costs that were planned for and related to restructuring). Now, ASC420 lays out specific guidelines for costs associated with the item. However, some restructuring charges can still occur over multiple years (e.g., costs that continue to be incurred due to contractual obligations, such as lease terminations or employee severance costs). Therefore, from a measurement perspective, these are largely transitory but can span multiple periods.

21.3. Empirical evidence

Cready et al. (2010) find that restructuring charges are the most common type of special items reported in their sample. They also find that repeated restructuring charges are positively associated with quarterly returns. However, investors value repeated restructuring charges like permanent components of earnings and thus are not misled by their exclusions from non-GAAP earnings. Black and Christensen (2009) find, for a subsample of infrequent non-GAAP reporters, that restructuring charges are positively associated with the likelihood of turning a GAAP loss into a non-GAAP profit or a GAAP miss into a non-GAAP beat, indicating managerial opportunism. Atiase (2004) finds that firms with multiple restructurings and loss firms have restructuring charges that are associated with future earnings and thus could have valuation implications.

McVay (2006) finds that managers may opportunistically shift core expenses into items such as restructuring charges and subsequently exclude restructuring charges from non-GAAP earnings. She finds evidence that such behavior is associated with future negative firm performance. More recently, Cain et al. (2020) show that core expenses that are opportunistically misclassified into special items, such as restructuring expenses, are associated with lower future earnings, cash flows, and returns. Their findings highlight the potential valuation implications of reported restructuring costs when used opportunistically. Importantly, such managerial behavior would make non-GAAP earnings less informative if restructuring charges are excluded.

21.4. Summary

Restructuring charges are not completely transitory and may be used by managers to manage earnings, such as when managers opportunistically reclassify core expenses into restructuring expenses. In some cases, restructuring charges can be correlated with future firm performance, such as due to real improvements in earnings post restructuring or when restructuring expenses are subject to classification shifting and are associated with lower future performance (McVay 2006). However, they are not expected to persist in the longer term. The academic rating is 3.54, supporting a high-quality view on the nature of this exclusion. The CFA Institute (2016) notes that restructuring costs can be an ongoing cost of business rather than a one-off expense. However, more of their survey respondents view this exclusion as appropriate (23.9%) rather than inappropriate (21.6%). We find that restructuring charges have an AR(1) coefficient of 0.12, which is relatively low. We classify restructuring charges as a high-quality exclusion, given their low persistence and that they are less likely to be part of ongoing business operations.

22. Discontinued Operations

22.1. Economic nature

Once managers decide to discontinue an operating segment, subsidiary, or asset group of the business, the income or loss from that discontinued segment or line of business is aggregated in discontinued operations. Since the business will not be continued, it makes sense to clearly report this item and exclude any gain or loss from continuing operations. These gains and losses are not expected to recur since they do not relate to ongoing business.

22.2. Empirical evidence

Barua et al. (2010) find that managers engage in classification shifting by shifting recurring expenses into discontinued operations. This practice would make non-GAAP earnings less informative if discontinued operations are excluded.

Curtis et al. (2014) do not find evidence of increased managerial opportunism when accounting standards (SFAS 144) allow a broader scope of items to be included in discontinued operations.

22.3. Summary

The academic survey suggests that discontinued operations is a high-quality exclusion with a score of 3.58. The AR(1) coefficient is 0.08, consistent with the idea that discontinued operations are not likely to persist into the future. We classify discontinued operations as a high-quality exclusion since it does not reflect core business performance.

Appendix 2
Examples of SEC comment letters

(1) Comment letters on presentation and prominence of non-GAAP metrics

Example 1: The firm presents a non-GAAP measure with greater prominence than their GAAP measure.

> We note from the press release included in exhibit 99.1 that EBIT-adjusted is the first measure presented in the exhibit, prior to net income. As required by instruction 2 of Item 2.02 of Form 8-K and Item 10(e)(1)(i)(A) of Regulation S-K, please revise to present GAAP net income with equal or greater prominence to the non-GAAP measure EBIT-adjusted.

Example 2: The firm begins its reconciliation table with its non-GAAP measure instead of its GAAP measure and does not provide a separate line item for the tax effect of non-GAAP adjustments.

> Please represent to us that you will revise future earnings releases furnished under Item 2.02 of Form 8-K to:
> - Reorder your non-GAAP reconciliation to start with net earnings attributable to Berkshire shareholders and reconcile to "operating earnings;" and
> - Separately present the income tax effect of your non-GAAP adjustments.
>
> For more guidance, refer to Questions 102.10 and 102.11 of the Compliance and Disclosure Interpretations for Non-GAAP Financial Measures revised on May 17, 2016.

Example 3: The firm presents non-GAAP metrics more prominently than GAAP earnings and does not explain how the non-GAAP metrics are useful to investors.

> You disclose non-GAAP financial measures more prominently than directly comparable GAAP measures; do not explain why each non-GAAP financial measure you present is useful to investors, do not explain how tax effects of adjustments are calculated; and appear to present a full non-GAAP income statement which may be inconsistent with the updated Compliance and Disclosure Interpretations issued on May 17, 2016. Please review this guidance when preparing your next earnings release.

Appendix 2 (continued)

(2) Comment letters on the reconciliation of non-GAAP to GAAP earnings

Example 4: The firm's reconciliation table does not clearly separate EBITDA, adjusted EBITDA, and combined adjusted EBITDA.

> We note your reconciliation from net income to EBITDA and Adjusted EBITDA is on a combined basis. Please revise your disclosure in future filings to include a reconciliation to the most directly comparable GAAP financial measure in accordance with Regulation G and Item 10(e)(1)(i) of Regulation S-K. Additionally, present Actual EBITDA and Actual Adjusted EBITDA, followed by a single adjustment for pre-acquisition and other adjustments to arrive at Combined EBITDA and Combined Adjusted EBITDA. Include within your response an example of your intended disclosure.

Example 5: The firm presents a non-GAAP net income per share measure but does not provide a reconciliation table on a per-share basis. Additionally, the firm does not provide a separate line item for the tax effect of non-GAAP adjustments.

> We note that you disclose a non-GAAP per share performance measure without direct reconciliation to GAAP earnings per share and you present adjustments to non-GAAP measures without showing income taxes as a separate adjustment in your earning release. This presentation is inconsistent with the updated Compliance and Disclosure Interpretations the Division issued on May 17, 2016. Please review this guidance when preparing your next earnings release.

Example 6: The firm presents a full non-GAAP income statement as a reconciliation table instead of presenting individual exclusions reconciling non-GAAP to GAAP measures.

> We reviewed your response to comment 5. We still believe that such presentation is inconsistent with the updated Compliance and Disclosure Interpretations issued on May 17, 2016. In that regard, please confirm to us that you will discontinue the presentation of a full non-GAAP income statement when reconciling non-GAAP measures to the most directly comparable GAAP measures in your future earnings releases.

(3) Comment letters asking for more justification of exclusions

Example 7: The SEC requests the firm to explain why a one-off gain from a sale is not excluded from non-GAAP earnings, which is inconsistent with its treatment of adjustments for other one-off items.

> We read your response to comment 4 that the gain from the sale of Yihaodian in China was not indicative of your normal business, represented a strategic shift in e-commerce strategy and that the gains from the shopping malls in Chile had a much smaller impact. In 2017 and 2016 you adjusted EPS for U.S. discontinued real estate projects, closure of stores globally and the accounting for certain leases. The nature of these adjustments, including Yihaodian, appears similar in that they are not indicative of your normal revenue generating operations. We view these adjustments as being similar to the $194M gain from the sale of shopping malls in Chile. The magnitude of the 2016 adjustment with regards to accounting for certain leases of $0.04 appears similar to the magnitude of the 2017 sale of shopping malls in Chile. We also note in your 2017 10-K, Exhibit 13, page 13, you disclose the $194M gain from the sale of shopping malls in Chile as one of only two reasons why membership and other income increased year over year, with the other being sale of the Yihaodian in China. Please explain in greater detail why an adjustment for the $194M gain on the sale of shopping malls in 2017 is not similar to what appears to be other infrequent, real estate related adjustments made in 2017 and 2016 that we noted in this comment. Your disclosure may be inconsistent with the updated Compliance and Disclosure Interpretations issued on May 17, 2016. Please review the guidance, particularly Question 100.02, when preparing your next earnings release.

Example 8: The SEC requests the firm to provide more details on acquisition and integration costs, which were excluded from non-GAAP earnings.

> We note your response to comment 2 and understand that your adjustments include "certain purchase accounting items" within acquisition and integration costs. Please further describe and quantify these "certain purchase accounting items" and tell us why they are not considered normal, recurring, cash operating expenses necessary to operate your business.

Example 9: The SEC points out that several of the firm's exclusions from non-GAAP measures are recurring.

> We note that your non-GAAP measures exclude purchased intangible amortization, restructuring costs, assets impairments, acquisition-related costs, and income tax items and that you describe these items as infrequent or unusual although you have reported similar items for multiple fiscal years. Please note that Item 10(e)(1)(ii)(B) of Regulation S-K prohibits you from adjusting a non-GAAP performance measure to eliminate or smooth items identified as non-recurring, infrequent or unusual, when the nature of the charge or gain is such that it is reasonably likely to recur within two years or there was a similar charge or gain within the prior two years.

Appendix 2 (continued)

(4) Comment letters questioning EBITDA

Example 10: The SEC requests the firm to explain why items such as depreciation and amortization, which were excluded from non-GAAP earnings, are not operating expenses that should be accounted for when evaluating operating results of the firm.

> We note your definition of Total Segment EBITDA, a non-GAAP measure, on page 17 and that you believe the measure allows users of the company's financial statements to evaluate changes in the operating results of the company separate from non-operational factors that affect net (loss) income, thus providing insight into both the operations and the other factors that affect reported results. Based on the definition, please explain to us how the adjustments provide insights into both the operations and the other factors that affect reported results. For example, depreciation and amortization and impairment and restructuring charges appear to be operating expenses rather than non-operating expenses. We note you present the adjustments as operating expenses on the face of the consolidated statements of operations.

Example 11: The firm excludes merger and acquisition expenses from non-GAAP earnings, but the SEC notes that these expenses appear to be recurring.

> In your adjusted EBITDA, adjusted cash earnings and adjusted cash earnings per share measures you add back NetSpend merger and acquisition expenses and label them as non-recurring. It appears the nature of merger and acquisition expenses are not non-recurring as you have completed other acquisitions within the past two years. Please confirm to us that you will not refer to these items as non-recurring in future filings or explain to us why such a description is appropriate. We refer you to Item 10(e)(1)(ii)(B) of Regulation S-K and Question 102.03, in the Non-GAAP Financial Measures section of our Compliance and Disclosure Interpretations.

Example 12: The firm excludes lease and rental expense from adjusted EBITDA, but the SEC notes that these expenses appear to be recurring and part of core operations.

> We note that you exclude lease and rental expense from Operating income/margin ("EBITDAR"). Please explain to us why lease and rental expenses are not a normal, recurring, cash operating expenses necessary to operate your business. See Question 100.01 of the updated Non-GAAP Compliance and Disclosure Interpretations issued on May 17, 2016.

Appendix 3
Variable definitions

Variables	Definition	Source
Non-GAAP exclusions		
Exclusion Quality Score	The firm-year measure of non-GAAP exclusion quality ranging from one to five and based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development.	Audit Analytics
Number of Exclusions	The total number of items excluded from non-GAAP earnings.	Audit Analytics
Total Exclusion/GAAP	The magnitude of total exclusions, measured as GAAP earnings (net income) minus non-GAAP earnings scaled by the absolute value of GAAP earnings, winsorized at the 1st and 99th percentiles by year.	Audit Analytics and Compustat
I(Non-GAAP > EBITDA)	Indicator variable that equals one if the current year non-GAAP earnings exceeds EBITDA, and zero otherwise.	Audit Analytics and Compustat
Firm Fundamentals		
Firm Size	Natural logarithm of total assets.	Compustat
Firm Age	Number of years since the first year of appearance on Compustat.	Compustat
Sales Growth	Percentage growth in sales of the current year.	Compustat
ROA	Profitability of the current year measured as income before extraordinary items divided by average total assets.	Compustat
I(Loss)	Indicator variable that equals one if the firm reports a GAAP loss, and zero otherwise.	Compustat
Leverage	Total liabilities divided by total assets.	Compustat
Cash Flow from Operations	Cash flow from operations divided by total assets.	Compustat
StdDev Sales Growth	Standard deviation of quarterly percentage growth in sales over the last five years.	Compustat
StdDev ROA	Standard deviation of quarterly return on assets over the last five years. Return on assets is measured as income before extraordinary items divided by average total assets.	Compustat
StdDev CFO	Standard deviation of quarterly cash flow from operations over the last five years scaled by beginning total assets of the fiscal year.	Compustat
UE	Actual I/B/E/S EPS minus the most recent consensus EPS forecast scaled by price per share.	I/B/E/S and CRSP
Abs(UE)	Absolute value of actual I/B/E/S EPS minus the most recent consensus EPS forecast scaled by price per share.	I/B/E/S and CRSP

Appendix 3 (continued)

Variables	Definition	Source
Price per share	Stock price per share at the fiscal year-end.	CRSP
Market Pressure		
Prior Stock Return	CRSP value-weighted index-adjusted buy-and-hold abnormal return over the fiscal year.	CRSP
TP Implied Ret	Implied return measured as the most recent analyst consensus target price forecast before the fiscal year-end divided by stock price at the fiscal year-end minus one.	I/B/E/S and CRSP
Stock Compensation	Percentage of shares held by the CEO out of the total shares outstanding.	ExecuComp
Institutional Ownership	Percentage of shares held by institutional investors out of the total shares outstanding.	Thomson Reuters
Forward ETP	Consensus analyst forecast for the upcoming fiscal year-end divided by market value of equity.	Compustat
Book to Market	Book value of equity divided by market value of equity.	Compustat
Ln(Analysts)	Natural logarithm of one plus the number of analysts following the firm.	I/B/E/S
Ln(Horizon)	Average forecast horizon of individual analyst forecasts for the one-year-ahead earnings. Forecast horizon is measured as the natural logarithm of one plus the number of days between the analyst earnings forecast date and the earnings announcement date.	I/B/E/S
Financial Reporting Quality		
FScore	F-Score following Dechow et al. (2011).	Compustat
Abs(Accruals)	Absolute value of working capital accruals measured as the change in current assets minus change in current liabilities plus depreciation expense scaled by average total assets.	Compustat
Disc Accruals	Peer-adjusted discretionary accruals. Discretionary accruals are estimated based on the modified Jones model by industry and year and adjusted for the average discretionary accruals within firms matched by industry, year, and closest return on assets.	Compustat
Ln(Report Lag)	Natural logarithm of one plus the number of days between the fiscal year-end and the annual earnings announcement date.	Compustat and I/B/E/S
Guidance	Indicator variable that equals one if the firm issues management earnings guidance on the date of the earnings announcement or the day after, and zero otherwise.	I/B/E/S

Appendix 3 (continued)

Variables	Definition	Source
Dependent Variables		
Comment Letter	Indicator variable that equals one if the firm receives any subsequent SEC comment letter against the firm's non-GAAP earnings reported in the current year, and zero otherwise.	Audit Analytics
RegG Violation	Indicator variable that equals one if there is a subsequent SEC Regulation G violation against the firm's non-GAAP earnings reported in the current year, and zero otherwise.	Audit Analytics
Forecast Dispersion	Forecast dispersion is calculated as the standard deviation of all analysts' annual EPS forecasts for the upcoming fiscal year-end over the three months before the earnings announcement, scaled by stock price at the beginning of the year.	I/B/E/S
IPE5	Intra-period efficiency (*IPE*), which measures the speed of price discovery over the next five trading days after the earnings announcement, following Blankespoor, deHaan, and Marinovic (2020). *IPE* is calculated as: $\frac{1}{6}\sum[1-\frac{(\lvert AbRet_5-AbRet_d\rvert)}{\lvert AbRet_5\rvert}]$, where $AbRet_d$ is the abnormal market-adjusted stock return over days [0, d] relative to the earnings announcement, and $0 \leq d \leq 5$.	CRSP and I/B/E/S
IPE10	Intra-period efficiency, which measures the speed of price discovery over the ten trading days after the earnings announcement, following Blankespoor, deHaan, and Marinovic (2020). The calculation is identical to *IPE5* but over a ten-day window.	CRSP and I/B/E/S