A Rating System to Evaluate Non-GAAP Exclusion Quality*

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Abstract: We evaluate non-GAAP exclusions reported by S&P 500 firms between 2013 and 2017 and develop a rating system that considers the economic nature, the accounting measurement rules, and the valuation implications of each exclusion. We rate each exclusion from 1 (*Low Quality*) to 5 (*High Quality*) and then weight each exclusion by its magnitude relative to total exclusions to obtain a firm-year metric of non-GAAP exclusion quality. We document that exclusion quality varies by industry, captures trends in non-GAAP reporting over time, and is reasonably stable for the average firm. We validate our metric by showing that low rating firms (1) have exclusions that academics, analysts, and regulators consider unreasonable, (2) are under more market pressure to perform and use low-quality exclusions to beat earnings expectations, and (3) report earnings news that investors take longer to assimilate into price. Our measure of non-GAAP exclusion quality is not correlated with accruals quality and does not simply reflect the magnitude of exclusions or earnings persistence, suggesting that this metric captures a unique attribute of non-GAAP reporting quality.

Keywords: Non-GAAP Reporting; Non-GAAP Exclusions; Special Items; Recurring Expenses.

JEL Classification: G12, M41.

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1. Introduction

The objective of our research is to provide a comprehensive picture of the types of non-GAAP exclusions used by large public companies and develop a measure of non-GAAP exclusion quality based on the economic nature, the measurement attributes, and the valuation implications of the individual exclusions. We believe that a simple and easy-to-communicate measure of non-GAAP exclusion quality will be helpful to users of financial statement information for two reasons. First, the practice of reporting non-GAAP metrics has become increasingly prevalent in recent years. In 2003, fifty percent of S&P 500 firms reported non-GAAP earnings, whereas by 2020, close to eighty percent of firms reported non-GAAP earnings. Therefore, users of financial statements are likely to encounter non-GAAP earnings metrics when evaluating a wide variety of firms. Our measure of exclusion quality can help users quickly assess whether a firm's exclusions are reasonable or need further investigation. Second, not only do more firms engage in non-GAAP reporting, but the variety and quantity of exclusions have also increased over time. Thus, users are facing greater challenges now than they may have in the past in knowing how to evaluate the aggregate quality of non-GAAP exclusions. Our framework for evaluating exclusions and determining an overall exclusion quality score can therefore help users better compare exclusion quality over time and across firms.

Why has the reporting of non-GAAP earnings increased over time? There are several potential underlying causes. 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 driven by GAAP earnings. The market "solution" to this problem has been an increasing use of non-GAAP metrics (e.g., cash from new subscribers), as a way of disaggregating earnings so as to better explain performance. A second reason is the evolving nature of accounting measurement rules. Accounting standards have increased in number and complexity over time and the result is that GAAP earnings contains "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). For some other items, Corporate America disagrees with rule makers on their measurement rules (e.g., stock compensation). Third, the instability and volatility of the business environment means that some firms are divesting, writing off assets, and restructuring, while others are engaging in mergers and acquisitions. These structural changes in businesses result in many "non-recurring" items flowing through earnings, which managers often exclude from non-GAAP earning metrics as a way of better

communicating core performance. Fourth, once a firm starts providing non-GAAP disclosures it can be difficult to stop, simply because investors expect the firm to report them. For example, Gomez, Heflin and Wang (2023) find that when firms stop providing non-GAAP income statements, information asymmetry around the earnings announcement increases, analyst forecast accuracy decreases, and forecast dispersion increases. Managers may be reluctant to stop non-GAAP reporting to avoid these potential negative consequences. Finally, non-GAAP exclusions are not explicitly regulated and so managers have discretion over what to exclude, when to exclude, and the level of detail provided on exclusions. This discretion gives managers flexibility to "manage" earnings, without having to actually engage in accruals or real earnings management (e.g., Black and Christensen 2009; Doyle, Jennings, and Soliman 2013; Black, Christensen, Joo and Schmardebeck 2017).

The SEC introduced Regulation G in 2003 to help market participants understand non-GAAP exclusions, including such rules as a reconciliation between the non-GAAP measure and the most directly comparable GAAP measure, presenting the GAAP measure with equal or greater prominence, and ensuring that the non-GAAP measure is not misleading. However, uncertainty remains about the quality of exclusions and whether they are made to help investors understand the true performance of the firm or whether they are simply used to make the firm look better than it actually is. Our objective is to provide a diagnostic measure of exclusion quality that can provide users with a simple way to assess the quality of the myriad of exclusions made for multiple reasons.

Our sample consists of annual non-GAAP earnings reported by S&P 500 firms between 2013 and 2017. Firms typically report multiple non-GAAP metrics, and in our analyses, we focus on the most aggressive non-GAAP earnings metric. We adopt this approach because we want to capture the full extent of managers' non-GAAP exclusions when we assess non-GAAP exclusion quality. We identify 24 unique non-GAAP exclusions from Audit Analytics and manually verify a random sample of these exclusion items against firms' Form 8-K filings. We group all remaining unidentifiable exclusions into an item labeled as "others (unidentified)". For each individual exclusion, we evaluate the accounting measurement rules and determine whether the item is likely to recur. We do this based on both accounting theory and empirical validation (i.e., the first-order autocorrelation). We also consider the economic nature of the item. For example, is it 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? Finally, we consider the valuation implications of the item. Specifically, is the item relevant for forecasting future cash flows or has the information already been impounded into price? The outcome of this analysis is a categorization of each exclusion item into five quality groups: *Low*,

Medium Low, *Neutral*, *Medium High*, and *High Quality*. Our guiding principle for low-quality exclusions is that the item is likely to recur in the future, is a regular business expense that does not reflect an investment outlay, and has valuation relevance. For example, we consider interest expense a low-quality exclusion, while gains and losses from discontinued operations a high-quality exclusion. Next, we assign each exclusion a score ranging from 1 (*Low Quality*) to 5 (*High Quality*). Finally, we calculate the weighted average non-GAAP exclusion quality score, where the weight is based on the magnitude of the exclusion relative to the total non-GAAP exclusions made by the firm during the year.

For our sample of firms, the median magnitude of total exclusions is large, accounting for approximately 39 percent of GAAP earnings. The average firm receives an exclusion quality score of 2.7 (between *Medium Low* and *Neutral Quality*) with an interquartile range from 1.9 to 3.3. We find that over 44 percent of firms stay in the same exclusion quality score category for two consecutive years. It suggests that most firms appear to 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 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, which is greater than the average of three items documented for earlier time periods (Black et al. 2018). We also find that firms are increasingly excluding more low-quality exclusion items from their non-GAAP metrics. The top four exclusions with the highest net impact on non-GAAP earnings are Depreciation and Amortization, Impairment on PPE and Intangible Assets, Net Interest Expense, and Stock Compensation Expense, most of which belong to lower-quality exclusion categories. We also document that low-quality exclusions are highly prevalent. For example, out of all sample firms that report Depreciation and Amortization, 47 percent exclude Depreciation and Amortization from non-GAAP earnings metrics. Likewise, 30 percent of sample firms that report net interest expense exclude it from their non-GAAP metrics. We provide additional evidence that the conventional belief that non-GAAP exclusions mostly involve non-recurring items no longer holds.

We show that our measure differs from other aspects of reporting quality. We document that the measure is not merely reflecting the magnitude of exclusions. We also show that the measure is not correlated with common measures of earnings quality such as absolute accruals, discretionary accruals, or the F-score. Furthermore, we find that the measure is not highly correlated with the persistence of GAAP or non-GAAP earnings, suggesting the relation between exclusion quality and earnings persistence is highly contextual.

We validate our exclusion quality score by determining whether other informed financial information users generally agree with our rating system. First, we compare our exclusion-quality classification scheme to the "non-GAAP" reporting guideline issued by the China Securities Regulatory Commission (CSRC).[1] The CSRC provides a list of income statement items that are considered extraordinary items and hence should be disclosed separately from core earnings to allow investors to obtain a more accurate view of operating performance. We document that our rating system identifies many of the items suggested by the CSRC as higher-quality exclusion categories. Second, we compare our score to survey results provided by the CFA Institute (2016) and find that there is consistency. Third, we conduct a survey with academics and analysts and ask them to score (from 1 to 5) individual exclusions based on their "third-party" professional judgement of whether the exclusion is appropriate and accepted for non-GAAP reporting. We find that the academics' ranking is highly correlated with our scoring of individual exclusions (Pearson correlation = 0.86, t-statistic = 7.74) and analysts' ranking is also positively associated with our scores (Pearson correlation = 0.57, t-statistic = 3.27), suggesting that both academics and analysts generally agree with our classification of exclusion quality.

We adopt several different empirical research approaches to examining whether our score captures an aspect of non-GAAP reporting quality. Our first test examines firm characteristics. Based on results of prior research, we predict that firms that make low-quality exclusions are more likely to be under market pressure to perform because of high embedded investor expectations. Consistent with this explanation, we find that low exclusion quality firms have stronger past sales growth and stock price performance, have more stock-based executive compensation, are more highly leveraged, have greater institutional holdings, and are younger firms. Our second test examines whether firms are more likely to have low quality exclusions when they need more exclusions to beat analysts' earnings expectations. We identify discretionary beats as the scenario where managers' non-GAAP metric meets or beats the analyst consensus forecasts, but the actual earnings (i.e., street earnings) reported in I/B/E/S misses the consensus forecasts. This situation occurs when the firm is able to beat consensus forecasts by having additional exclusions beyond those that analysts commonly agree should be made. Using regression analysis where we control for a multitude of factors, we document a significant and negative association between the exclusion quality score and the incidence of a discretionary beat.

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[1] This non-GAAP reporting guideline issued by 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. We read the SEC's comment letters on non-GAAP reporting practices and we do not find that the SEC explicitly identifies any unreasonable non-GAAP exclusion.

Next, we test our predictions of how users (regulators, analysts, and investors) will differentially respond to non-GAAP exclusion quality. We predict that firms with low exclusion quality are more likely to face regulatory scrutiny. We provide evidence 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. More importantly, the magnitude of total exclusions does not appear to influence regulatory outcomes, suggesting that it is the economic nature or quality of the exclusions, rather than their magnitude, that attracts higher levels of regulatory scrutiny.

We predict that analysts will have more difficulty forecasting earnings when non-GAAP exclusion quality is low. When managers make non-GAAP adjustment choices that are less appropriate from analysts' point of view, analysts are likely to have more divergent opinions about which non-GAAP adjustments they should exclude or include in their forecasts. We document that forecast dispersion is higher among analysts following firms with lower exclusion quality scores, consistent with less agreement on exclusions. We also show that the magnitude of total exclusions does not explain analyst forecast dispersion, again suggesting that more sophisticated users of financial information pay more attention to the economic nature or quality of non-GAAP exclusions rather than the magnitude of these exclusions.

We expect that investors will have more difficulty interpreting and assessing the earnings news for firms with lower exclusion quality. We document that a lower non-GAAP exclusion quality score is associated with a slower price discovery over the five and ten trading days following the earnings release. This result continues to hold after controlling for the magnitude of earnings surprises, the time lag between the fiscal year end and the earnings release, management guidance, and price per share. This result suggests that investors find it more difficult to process non-GAAP earnings with lower exclusion quality and so are less likely to trade immediately after the earnings releases. In contrast to our results for analysts and regulators, we find that the magnitude of total non-GAAP exclusions also appears to make it difficult for investors to interpret earnings news. Overall, these results are consistent with the exclusion quality metric capturing a measure of reporting quality.

Our measure of non-GAAP exclusion quality contributes to and builds on prior research on non-GAAP earnings in several ways. Prior research is often polarized in their conclusions of whether exclusions are made to inform investors or to opportunistically manipulate expectations. On the one hand, we have papers that provide evidence that exclusions improve reporting quality by showing

that non-GAAP earnings better predicts future earnings or cash flows than does GAAP earnings (e.g., Bradshaw, Christensen, Gee, and Whipple 2018). On the other hand, we have papers that conclude that exclusions are opportunistic (e.g., Frankel, McVay, and Soliman 2011; Doyle, Jennings, and Soliman 2013). Our approach of providing an exclusion quality score that is continuous allows financial information users to aggregate the myriad of different exclusions and develop an overall ranking of the likelihood of signaling versus opportunism. In addition, our study can also aid in future research by providing an aggregate measure of exclusion quality.

In addition, our score can be used to better capture how non-GAAP exclusion quality can vary by industry, across firms, and over time. With data limitation, prior research focused on disaggregating exclusions into recurring and nonrecurring components (e.g., Doyle, Lundholm, and Soliman 2003; Palmrose and Scholz 2004; Kolev, Marquardt, and McVay 2008). This approach allows large sample analysis but provides just two buckets for exclusions and so it is difficult to observe 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 changes over time. Thus, our study contributes to the growing literature on the comparability and consistency of non-GAAP reporting (e.g., Black et al. 2021).

Our score complements other research considering reporting quality. Specifically, Chen, Lee, Lo, and Yu (2021) develop a qualitative non-GAAP quality measure based on the narrative characteristics of non-GAAP disclosures. In contrast, our approach utilizes the rich quantitative information contained in individual non-GAAP exclusions. Therefore, both our score and their score fill a gap in prior research that enables researchers and practitioners to directly assess the overall quality of firms' non-GAAP reporting. Finally, in practice, we believe that our score can be easily implemented by financial information users such as regulators, investors, and analysts for assessing exclusion quality and help in their decision making.

Our paper proceeds as follows. In Section 2, we discuss the theoretical development of the non-GAAP exclusion quality score, provide examples of its calculation, and triangulate its reasonableness using survey evidence. After establishing the score, in Section 3 we discuss prior research on non-GAAP exclusion quality and develop our predictions. Section 4 describes our sample and data and provides empirical evidence on our predictions. Section 5 concludes.

2. Measuring Non-GAAP Exclusion Quality

2.1 Developing the Non-GAAP Exclusion Score

The typical decomposition of earnings ($GAAP\ E$) is into its accruals (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 impact both cash flows and accruals, while the accounting measurement rules impact accruals. Therefore, cash and accrual components can be transitory (tr), permanent (pe), or neither fully transitory nor fully permanent (neutral, nu):

$$GAAP\ E\ =\ Acc^{tr} + Acc^{nu} + Acc^{pe} +\ CF^{tr} + CF^{nu} + CF^{pe}. \tag{2}$$

Managers have a choice of what to exclude (x) and what to include (in) in non-GAAP earnings ($Non\text{-}GAAP\ E$):

$$GAAP\ E\ =\ Acc^{tr\_in} + Acc^{nu\_in} + Acc^{pe\_in} +\ CF^{tr\_in} + CF^{nu\_in} + CF^{pe\_in} + Acc^{tr\_x} + Acc^{nu\_x} +$$
$$Acc^{pe\_x} +\ CF^{tr\_x} + CF^{nu\_x} + CF^{pe\_x}. \tag{3}$$

And so,

$$NonGAAP\ E\ =\ Acc^{tr\_in} + Acc^{nu\_in} + Acc^{pe\_in} +\ CF^{tr\_in} + CF^{nu\_in} + CF^{pe\_in} \tag{4}$$

and

$$Total\ NonGAAP\ Exclusions\ =\ Acc^{tr\_x} + Acc^{nu\_x} + Acc^{pe\_x} +\ CF^{tr\_x} + CF^{nu\_x} + CF^{pe\_x} \tag{5}$$

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

$$High\ Quality\ Exclusions =\ Acc^{tr} + CF^{tr} \tag{6a}$$

$$Neutral\ Quality\ Exclusions = Acc^{nu} + CF^{nu} \tag{6b}$$

$$Low\ Quality\ Exclusions = Acc^{pe} + CF^{pe}. \tag{6c}$$

When evaluating the quality of the exclusion, we consider both the underlying economics (which can impact the persistence of both accruals and cash flows) and the accounting measurement rules (which impact accruals). We also consider the valuation implications of the excluded item and its meaning for core earnings. We provide details of our approach in the next section.

We calculate the non-GAAP exclusion quality score across all N exclusions for firm i in year t using the following formula:

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

where $Rating_n$ is the exclusion quality score of exclusion item n, and $abs(Magnitude_{i,n,t})$ is the absolute magnitude of exclusion item n for firm i in year t. Each exclusion is given a rating from 1 (*Low Quality*) to 5 (*High Quality*). This 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. Almost all exclusions are expenses and losses (i.e., income-increasing for non-GAAP earnings). We assign all income-decreasing exclusions a neutral score of 3 for two reasons. First, these exclusions lead to lower non-GAAP earnings than GAAP earnings, and so are less likely to be opportunistic. Second, most income-decreasing exclusions we observe relate to recognizing the tax benefits of an excluded item and therefore are generated by exclusions of varying qualities.

2.2 Rating Individual Non-GAAP Exclusions

We develop a taxonomy of non-GAAP exclusions based on the exclusion items provided by Audit Analytics and assign each exclusion into five quality categories: *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*. Exhibit 1 presents the exclusion taxonomy along with each exclusion's quality category and its first-order autocorrelation (AR1) coefficient based on all firm-years from Compustat from 2000 - 2021. We aim to provide investors with a rating system to evaluate the quality of non-GAAP exclusions so that they could make more informed decisions about the financial health and future prospects of a company. In this sense, we take a valuation rather than stewardship perspective. Specifically, we consider the following factors in rating each exclusion.

[Exhibit 1]

(1) *Is the excluded item likely to recur in future years*? To assess whether an excluded item is likely to recur, we consider the transaction or event that generated the item, and where possible, we also estimate the first-order autocorrelation (AR1) coefficient for the item using all firms that report the item on Compustat. Our maintained assumption is that higher-quality exclusions have lower AR1 coefficients since they are less likely to recur. This is consistent with managers excluding such items to provide investors with a more accurate view of the firm's current "core" earnings. Based on this factor, we classify exclusions such as gains and losses from discontinued

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operations and litigation charges as *High Quality* since, from an economic perspective, these items should be less likely to recur.

(2) *Does the accounting 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). The result is a mixed attribute measurement system that can lead to confusion because transitory items are not necessarily easily identifiable. Therefore, a firm could have a recurring transaction that produces transitory accruals. For example, foreign currency gains and losses are correcting balance sheet accounts and we expect them to recur for firms with foreign operations. However, the gains and losses are transitory and lower the persistence of GAAP earnings. Similarly, unrealized fair value adjustments from trading securities recur but often have little predictive ability when it comes to future earnings. Thus, these exclusions are considered *Neutral Quality* even though economically, they recur.

(3) *Is the exclusion item relevant for forecasting future cash flows?* We use prior empirical evidence to guide this consideration. For example, litigation settlement costs are more relevant for the current period but have low predictive power for future cash flows. Thus, the exclusion is *High Quality*. In contrast, ignoring interest expense when forecasting future cash flows will overestimate the amount of cash flows available to run the business, given the firm's current capital structure. Thus, the exclusion of interest expense is *Low Quality*.

We use depreciation as another example to further illustrate how to use the above three guiding principles. First, depreciation is economically relevant. We expect capital expenditures to recur in the future because they are key to running the core business. Second, the accounting for depreciation is focused on income (smoothing out the capital expenditures by matching the costs to accomplishments over time). Third, ignoring capital expenditures in a valuation model will result in overstating future free cash flows and hence overvaluing the firm. In addition, prior research shows that depreciation and amortization is negatively associated with future operating earnings, consistent with it being a low-quality non-GAAP exclusion (e.g., Black and Christensen 2009; Whipple 2015). Therefore, we classify the exclusion of depreciation as *Low Quality*. Appendix 2 provides details on the rationale behind each exclusion's categorization.

Exhibit 2 provides examples of the calculation of our 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 mapped to our exclusion taxonomy in Exhibit 1, along with the corresponding exclusion quality score ($Rating_n$) 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 exclusion 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 exclusion item. For example, tax and accounting rule changes is *High Quality* and assigned a score of 5. *Johnson & Johnson* reports tax and accounting rule changes as "*Impact of tax legislation*" in the reconciliation table. This item has an absolute amount of $13,556 million, representing 72 percent of the sum of absolute non-GAAP exclusions ($18,740 million) reported by the firm. The weighted exclusion quality score for *Johnson & Johnson*'s tax and accounting rule changes for 2017 is thus 3.62 (= 5 × 0.72). The weighted score is calculated in a similar way for the rest of the exclusions reported by *Johnson & Johnson*.

The bottom row of Panel B reports column totals for all six non-GAAP exclusions. The final weighted average exclusion quality score is the sum of the weighted score across all exclusions and is equal to 4.33. In our empirical analysis, we sort firm-year observations into five groups (i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*) based on the quintile ranks of exclusion quality scores by year. Specifically, firms with exclusion quality scores below the 20th, between 20th and 40th, between 40th and 60th, between 60th and 80th, and above the 80th percentiles are labeled as firms with *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High* non-GAAP exclusion quality, respectively. Based on the quintile rankings of our sample firms in 2017, *Kellogg*'s non-GAAP exclusion quality is rated as *High*.

Panels C and D provide a second example, *Transdigm Group Inc.*, with a *Low* non-GAAP exclusion quality in 2017. Based on the methodology described above, we calculate the non-GAAP exclusion quality score for each firm during each year in our sample.

[Exhibit 2]

2.3 Validating the Categorization of Non-GAAP Exclusions

We compare our exclusion classification to the "non-GAAP" reporting guideline issued by the China Securities Regulatory Commission (CSRC) on income statement items that are considered as extraordinary items, and hence should be disclosed separately from core earnings to allow investors to obtain a more accurate view of operating performance. Exhibit 3 provides a list of these items in Column (1), the corresponding U.S. non-GAAP exclusion according to our exclusion taxonomy in

Column (2), and the corresponding exclusion quality as defined in Exhibit 1 in Column (3). We show that all the exclusion items suggested by the CSRC are rated as *Neutral* to *High Quality* exclusions based on our classification. This comparison helps to validate that our exclusion quality classification is largely consistent with regulators' view on what individual items should be excluded from non-GAAP earnings.

We also compare our exclusion classification to survey results provided by the CFA Institute (2016). The CFA Institute (2016) survey includes 558 respondents with 65.7 percent being buy-side analysts or portfolio managers. Their Table 3.2 (on page 31) lists whether respondents viewed excluded items as appropriate, sometimes appropriate/inappropriate, usually inappropriate, or not sure. The CFA Institute does not provide an overall ranking of items in terms of the views of respondents. However, similar to us, respondents viewed items such as one-off asset sales as appropriate to exclude (56.3%) while items such as stock compensation as inappropriate to exclude (55.4%). In contrast to our perspective, respondents were more ambivalent on depreciation with 33.2 percent viewing the exclusion as usually appropriate and 35.4 percent as usually inappropriate.

In addition, we conduct a survey with a group of financial analysts and academics. We ask them to provide their ratings of the quality of individual non-GAAP exclusions. This survey allows us to gather "third-party" professionals' perceptions of the appropriateness of excluding each item for non-GAAP reporting. Specifically, we ask academics and analysts to rate, on a scale from 1 to 5, whether they think each item in Exhibit 1 should or should not be excluded from non-GAAP earnings. In the survey, a rating of one indicates a view that the item should not be excluded from non-GAAP earnings, and five that the item should be excluded from non-GAAP earnings. A rating of three indicates a neutral view. Exhibit 4 summarizes the academics' and analysts' responses to the survey. In Panel A, Column (2) and (3) present the average academic and analyst rating for each exclusion item, respectively, which are compared with our score in Column (1). In general, academics' ratings are increasing in the direction of our exclusion quality score. For example, the average academic rating for exclusions that we classify as *Low Quality* is 1.5, while the average academic rating for exclusions that we classify as *High Quality* is 3.3. Panel B reports the correlation matrix. We find a Pearson correlation coefficient of 0.86, with statistical significance at the 0.01 level (*t*-statistic = 7.74), between the average academic rating and our exclusion quality score. [2] Analysts, however, tend to

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[2] We conducted an initial survey with a set of academics and based on the survey results, made a few small adjustments to our categorization (e.g., we originally gave tax and accounting rule changes a score of 4 but based on the initial survey we changed this to 5). We emailed the same survey to a broader set of academics and analysts. The results reported in Exhibit 4 are based on the findings from the broader survey. The correlation of our original metric with the initial survey was 0.72.

avoid using ratings of 1 and 5 and give more neutral ratings in their responses. Nevertheless, their rating is still positively correlated with our exclusion quality score (Pearson correlation = 0.57, *t*-statistic = 3.27). This survey evidence indicates that our exclusion quality classification is in line with both academics' and industry professionals' view of non-GAAP exclusion quality.

[Exhibit 3 and Exhibit 4]

3. Prior Research on Non-GAAP Exclusions and Predictions

The literature on managers' non-GAAP reporting is extensive. Below we distinguish research that has analyzed non-GAAP exclusions from studies that examine the quality of non-GAAP earnings. We discuss how developing the non-GAAP exclusion score adds to these lines of research. We then provide our predictions. For a comprehensive discussion of the non-GAAP literature, see Black et al. (2018).

3.1 Identifying Non-GAAP Exclusion Items

The question of which items are 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 in terms of sample size and data granularity. For example, researchers often have to choose between larger samples with less detail about exclusions versus smaller samples with greater detail.

Much of the early research uses I/B/E/S actual earnings (i.e., street earnings) to proxy for managers' non-GAAP earnings. This research often decomposes total exclusions into non-recurring (special) and recurring items (e.g., Doyle, Lundholm, and Soliman 2003; Palmrose and Scholz 2004; Kolev, Marquardt, and McVay 2008). These early studies find that recurring items excluded from non-GAAP earnings have important implications for future firm performance, and that overall, non-GAAP exclusions have improved in quality (i.e., are more transitory) following the implementation of Regulation G. Other researchers collect and analyze non-GAAP earnings data from earnings releases for selected samples over shorter time periods (e.g., Bhattacharya, Black, Christensen, and Larson 2003; Black and Christensen 2009; Christensen, Drake, and Thornock 2014; Bentley, Christensen, Gee, and Whipple 2018). For example, Bhattacharya et al. (2003) examines a sample of 1,149 non-GAAP earnings announcements between 1998 and 2000. They identify seven common exclusions made by managers and group all other exclusions into one category. Christensen et al. (2014) extend

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Both surveys were performed before making the paper public by posting it on SSRN. We used SurveyMonkey to perform the survey.

the sample period to 2006 and classify 13 individual exclusions and group all other exclusions into one category. Both studies document that depreciation and amortization expense and stock-based compensation are the most frequent identifiable exclusions. 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 can be lost in the aggregation process.

Bentley et al. (2018) provide more evidence on individual non-GAAP exclusions based on 50 firm-quarters from 2003 to 2012. They classify eight individual exclusions and group exclusions of some important recurring expenses such as depreciation and R&D expense into the "other recurring" category and group many non-recurring items such as insurance and legal settlement into the "other transitory" category. Black et al. (2021) focus on managers' non-GAAP reporting *per se*. They provide a more detailed picture of non-GAAP reporting practices among S&P 500 firms from 2009 to 2014.[3] They examine both the frequency and magnitude of 15 individual exclusions and use a category of "uncommon items" for all other exclusions. Their findings suggest that the exclusions of non-recurring items appear to have a higher frequency and larger magnitude than recurring items.

These prior studies on non-GAAP exclusions take a valuation perspective. In contrast, another line of research takes a stewardship perspective as non-GAAP metrics are also used in executive compensation and debt contracting. For example, Urcan and Yoon (2023) study the performance measures and the detailed exclusions used in compensation contracts. They find that sales measure is most frequently used in recent years. From bottom-line net income to top-line sales, they identify 27 different exclusion items and group them into the recurring versus transitory category. They show that among identifiable exclusion items, the three most frequent exclusions are restructuring charges, M&A costs, and gains and losses.

In summary, prior research has generally grouped individual exclusions into large categories (recurring vs. non-recurring), with more recent research providing additional insights into more categories. Our study contributes to this line of literature by (1) identifying a more comprehensive list of individual non-GAAP exclusions (25 items) for more recent years from 2013 to 2017; (2) providing guiding principles for categorizing exclusions based on the economic nature, the measurement attributes, and the valuation implications that can be used by future research as more exclusion types come to light; (3) developing a ranking system that can help financial information

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[3] Black et al. (2021) uses a similar sample and classification as Black et al. (2018). Both papers provide a detailed landscape of non-GAAP reporting practices among S&P 500 firms during 2009-2014.

users determine the quality of an exclusion; and (4) designing a method that aggregates the exclusions that are in different quality buckets into an overall quality score that financial information users can readily use in their decision making.

3.2 Evaluating Non-GAAP Reporting Quality

Early studies investigate whether non-GAAP earnings are more value-relevant than GAAP earnings (e.g., Bradshaw and Sloan 2002; Brown and Sivakumar 2003; Lougee and Marquardt 2004). These studies find that non-GAAP earnings is generally more value-relevant than GAAP earnings (e.g., non-GAAP earnings is more highly correlated with stock returns). Early research also questions managers' intentions for excluding certain items, and subsequent studies along this line investigate circumstances where managers use non-GAAP metrics to mislead the market (Frankel et al. 2011; Brown, Christensen, Elliott, and Mergenthaler 2012).

Some other studies use a different approach to evaluating non-GAAP earnings quality. Specifically, this approach evaluates non-GAAP earnings quality by determining the extent to which non-GAAP earnings is useful for predicting future performance metrics (e.g., Doyle, Lundholm, and Soliman 2003; Landsman, Miller, and Yeh 2007; Bentley et al. 2018). However, an issue with this approach, as pointed out by Black et al. (2018), is that regressing future performance on current exclusions mechanically misses the associations between recurring exclusions that are labeled as transitory (e.g., restructuring expenses) and future earnings. Therefore, this approach is subject to a mechanical relation between current exclusions and future performance. More specifically, this issue arises because researchers commonly use operating earnings as a future performance metric, which excludes items that firms label as transitory but recur. Davidson, Gomez, Heflin and Wallace (2022) demonstrate that the persistence of exclusions, measured by the mapping of current exclusions to future performance, is a poor indicator of non-GAAP earnings quality. In addition, as can be seen from Equation (4) in Section 2.1, even after the exclusions, non-GAAP earnings could still include transitory accruals and cash flow components and thus have low persistence and predictive ability. We reexamine the persistence of GAAP and Non-GAAP earnings and whether it relates to our exclusion quality score. However, we recognize that the relation is likely to be contextual given the different circumstances investigated by prior research.

Another approach to evaluating non-GAAP earnings quality is to examine the extent to which non-GAAP exclusions relate to transitory items. For example, Kolev, Marquardt, and McVay (2008) find that exclusions are more transitory after SEC intervention, indicating that SEC intervention improves non-GAAP reporting quality. However, we observe that the practice of excluding more

permanent items from non-GAAP earnings exhibits an increasing trend. We add to this line of research by quantifying the quality of exclusions and showing how this trend has continued to increase in more recent years; identifying the industries that are most likely to engage in this practice; and providing additional insights into the impact of this trend on users of financial statements. In addition, we investigate whether our exclusion quality score is useful in predicting regulatory interventions such as SEC comment letters and violations of Regulation G.

Other studies focus on managers' incentives for non-GAAP reporting. This research generally draws polarized conclusions on whether managers are using non-GAAP exclusions for informative or opportunistic purposes. Studies that support an informative perspective provide evidence that firms report non-GAAP earnings to better inform investors about the firms' fundamental performance (e.g., Lougee and Marquardt 2004; Curtis, McVay, and Whipple 2014; Brown, Huffman, and Cohen 2021; Black et al. 2021; Hribar, Mergenthaler, Roeschley, Young, and Zhao 2022). For example, Curtis, McVay, and Whipple (2014) find that managers could exclude transitory gains from non-GAAP earnings (i.e., income-decreasing exclusions) to inform investors. Black et al. (2021) suggest that managers deviate from common non-GAAP reporting practices to enhance earnings informativeness, and that non-GAAP adjustments allow non-GAAP earnings to be more comparable across firms than GAAP earnings. We add to this line of research by investigating whether exclusion quality varies by industry and over time, and the relation of exclusion quality to accruals quality and earnings persistence.

In contrast, other studies support the managerial opportunism perspective (e.g., Black and Christensen 2009; Frankel, McVay, and Soliman 2011; Brown et al. 2012; Doyle, Jennings, and Soliman 2013; Christensen, Drake, and Thornock 2014; Laurion and Sloan 2022). For example, Doyle, Jennings, and Soliman (2013) demonstrate that managers exclude certain items so as to report non-GAAP earnings that are greater than analyst forecasts. Frankel, McVay, and Soliman (2011) provide similar evidence prior to insider sales and find that the phenomenon is more prevalent in the absence of independent board members. Brown et al. (2012) document that when investor sentiment is high, managers are more likely to use non-GAAP exclusions to meet or beat earnings targets to facilitate their insider sales subsequent to the earnings releases. Christensen, Drake, and Thornock (2014) find that short interest is higher when non-GAAP reporting is more aggressive, suggesting that sophisticated investors see arbitrage opportunities when managers' opportunistic non-GAAP reporting creates temporary mispricing. These studies are consistent with market pressure playing a role in the reporting of non-GAAP earnings. We extend this research by examining whether exclusion quality is lower for managers that receive relatively more stock-based compensation.

Documenting such a result would support the arguments of prior research that maintaining the stock price is a motivation for reporting low quality non-GAAP earnings. We also investigate whether exclusion quality is related to market pressure proxies and whether firms that use low quality exclusions do so because it is the only way they can beat analysts' expectations.

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 Chen at al. (2021) by developing a quantitative non-GAAP exclusion quality score that directly assesses the overall exclusion quality of non-GAAP earnings.

In a concurrent paper, Gee, Li, and Whipple (2023) develop a quarterly measure of exclusion persistence, where higher exclusion persistence indicates lower quality because it suggests that the excluded items are more likely to be related to core earnings. They have a different focus from us because they use hold-out samples to estimate the persistence coefficients of exclusion items in relation to future operating earnings/cash flows, and then construct the exclusion persistence measure using the estimated persistence coefficients weighted by exclusions of transitory items and other items. They show that their measure can predict future returns and therefore is useful to investors and regulators. Our paper has a very different focus and we do not develop a prediction model. We also validate our metric using a variety of approaches (discussed in Section 2.3). Finally, Gee, Li, and Whipple (2023) focus primarily on decomposing exclusions into two categories (transitory versus other), whereas we break down non-GAAP exclusions into 25 individual exclusion items, and group them into five quality categories based on the economic nature, accounting measurement, and valuation implications of each item.

3.3 Predictions

Our predictions closely follow and build on findings in the non-GAAP literature. Our aim is to validate our measure of non-GAAP exclusion quality by showing that it varies in ways we would expect, assuming it captures quality.

Our first investigation is descriptive and relates to the informativeness of non-GAAP earnings. Informative non-GAAP reporting is expected to have consistency and comparability (e.g., Curtis, McVay, and Whipple 2014; Black et al. 2021). Based on prior research, we provide descriptive evidence on the following two ideas. First, if firms care about reporting consistency, then they will report the same types of exclusions over time and so there will be firm-level persistence in their exclusion quality. Specifically, we expect that our exclusion quality scores are serially correlated over time due to firms consistently excluding certain items. Second, if firms want to make their non-GAAP earnings more comparable, then they will tend to exclude similar items as their industry peers. Thus, we expect exclusions scores to vary across industries because firms in the same industry exclude similar items for comparability purposes. In addition, we also seek to determine whether our metric is a unique measure of reporting quality and it is not subsumed by measures of accrual quality or earnings persistence.

We next investigate the role of opportunism. We predict that firms that face more market pressure to meet expectations will use lower-quality exclusions because the added discretion enables them to meet and beat benchmarks (e.g., Brown et al. 2012; Doyle, Jennings, and Soliman 2013). This leads to the following predictions.

Prediction 1: *Firms with lower non-GAAP exclusion quality scores face stronger market pressure to meet or beat earnings expectations.*

Prediction 2: *Firms with lower non-GAAP exclusion quality scores are more likely to have a discretionary beat.*

Prediction 1 relates to firm characteristics. We use an array of variables to proxy for market pressure, such as stronger prior sales growth, stronger prior stock price performance, higher target price forecasts, more stock-based compensation, and higher leverage. Prediction 2 focuses on selecting exclusions to beat expectations. We define a discretionary beat as where managers' non-GAAP metric meets or beats analysts' consensus forecast, while the street earnings reported in I/B/E/S misses the consensus forecast. Such scenarios likely reflect managerial opportunism in non-GAAP reporting (e.g., Black and Christensen 2009; Doyle, Jennings, and Soliman 2013).

Our next three predictions focus on implications of exclusion quality for different users of financial information, including regulators, financial analysts, and investors. Prior research predicts that firms with lower quality reporting 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, Heflin, and Wang 2023). Thus, we predict the following:

Prediction 3: *Firms with higher non-GAAP exclusion quality scores are less likely to receive SEC comment letters and citations for Regulation G violations.*

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 non-recurring, higher quality non-GAAP exclusions. Therefore, we predict 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, Kothari, and Verdi 2011).

Prediction 4: *Firms with higher non-GAAP exclusion quality scores have lower analyst forecast dispersion.*

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, deHaan, and Marinovic 2020). For example, Doyle, Lundholm, and Soliman (2003) find that investors do not fully impound the implications that recurring non-GAAP exclusions have on future cash flows. Christensen, Drake, and Thornock (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, Rodriguez-Vazquez, and Toynbee (2023) 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, then we can expect a positive relation between our non-GAAP exclusion quality score and the speed of price discovery over the short window following earnings releases.

Prediction 5: *Firms with higher non-GAAP exclusion quality scores have speedier price discovery following earnings releases.*

4. Empirical Results

4.1 Data and Sample Selection

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 items reported by S&P 500 firms from December 2013 to June 2018.[4] We focus on annual data since assessing firms' non-GAAP quality on an annual basis will allow us to include all items that were excluded during the fiscal year. From Audit Analytics, we obtain data for 538 unique firms with annual earnings reports, which gives us an initial sample of 1,926 firm-years. Then we remove firm-years that did not report a non-GAAP metric for net income, EPS, operating income, EBIT, or EBITDA, and firm-years with missing non-GAAP-to-GAAP reconciliation data. For firms that report multiple non-GAAP earnings metrics, we identify the most aggressive non-GAAP metric which likely contains the greatest number of non-GAAP exclusions. Specifically, if a firm reports a non-GAAP metric for EBITDA, we identify adjusted EBITDA as its non-GAAP earnings metric. Otherwise, we identify a firm's non-GAAP earnings metric as adjusted EBIT, adjusted operating income, adjusted EPS, or adjusted net income, in that order. Our final dataset consists of 1,665 firm-years for 488 unique firms. The sample sizes for subsequent tests vary based on data availability of the control variables necessary for each analysis.

For each firm-year observation in our sample, we then construct the variables employed in our analyses. We obtain financial data from Compustat, stock return data from the Center for Research in Security Prices (CRSP), institutional ownership data from Thomson Reuters, analyst forecast data from I/B/E/S, and comment letter and Regulation G violation data from Audit Analytics. All variables are further defined in Appendix 1.

4.2 Analysis of Individual Non-GAAP Exclusions

We first provide descriptive patterns in non-GAAP reporting at the firm-year level. Panel A of Figure 1 plots the distribution of firms by the total number of items they exclude. Black et al. (2018) document an average of 3 items for the period 2009–2014. We find that, on average, firms exclude 5 items each year during the period 2013–2017, suggesting that firms are excluding increasingly more items from non-GAAP earnings metrics over time. The maximum number of exclusions is 14, and the interquartile range is from 3 to 7 (Panel A of Table 2). We find that around 60 percent of firms exclude

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[4] Audit Analytics provides non-GAAP reporting data for S&P500 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.

1 to 5 items each year, and that 3 percent of firms have more than 10 exclusions for non-GAAP reporting.

Next, we provide the percentage of firms excluding each individual exclusion. Prior research calculates this percentage as the number of firms excluding the item divided by the total number of sample firms (e.g., Black et al. 2018; Bentley et al. 2018). This calculation, however, underestimates the prevalence of some exclusions since a firm may not have engaged in the transaction and hence does not report the item in its GAAP earnings. Therefore, we measure the "relative" percentage as the number of firms excluding the item divided by the number of firms in the sample that report a non-zero value for the item on Compustat, following Black et al. (2021). Audit Analytics provides data on non-GAAP exclusions and among our exclusion items, Compustat has the corresponding variables for 20 items. For these 20 items we calculate the relative percentage of firms that exclude each item.

Panel A of Table 1 provides a summary of each item. Red shading represents *Low Quality*, grey *Neutral Quality*, and green *High Quality*. Column (2) reports the number of firms excluding the item and Column (3) reports the number of firms that report the item. Column (4) reports the "relative" percentage of firms excluding the item (i.e., Column (2) divided by Column (3)), thus presents how likely is an item to be excluded, conditional on it being reported. Panel B of Figure 1 visualizes this "relative" percentage. It clearly indicates that the likelihood of exclusion conditional on having reported the item varies considerably both within and across quality categories. Column (5) provides the percentage of sample firms *reporting* the item as provided on Compustat (i.e., Column (3) divided by 1,665). Column (6) reports the percentage of sample firms that *exclude* the item (i.e., Column (2) divided by 1,665). We provide Columns (5) and (6) to help compare our findings with prior research.

Some interesting patterns emerge from Panel A of Table 1. Specifically, for the low-quality exclusions, Column (5) indicates that around 95% of firms report depreciation and interest expenses, and Column (4) indicates that these two items are excluded by over 47 and 30 percent of firms that report them, respectively. Thus, at least one-third of the firms that have these items are excluding them to report some measure of EBITDA or free cash flows. For the *Medium Low* category, we see that only about 20 percent of firms report pension related expenses, but of these firms, 82 percent exclude the item. This suggests that managers do not consider these items meaningful to performance. In contrast, stock compensation is reported by 99 percent of firms, with only 21 percent of these firms excluding it. Therefore, it is relatively rare to exclude stock compensation, at least among larger firms. Turning to *Neutral Quality* exclusions, we see that about 38 percent of firms

report impairments on PP&E and intangibles, but the vast majority of these firms (88%) exclude them from non-GAAP earnings. Turning to the *Medium High* category, merger/acquisition costs are both commonly reported (66%) and almost always excluded (88%). In contrast, reporting debt extinguishments is rare (28%) but over 70% of reporting firms exclude it. Turning to the *High Quality* category, we find that out of firms that report discontinued operations (27%), almost half (49%) exclude it. While we expected that more firms would exclude this item, it is also common to report GAAP earnings before discontinued operations, thus there is less need to reconcile this item.

As discussed earlier, prior research can give a distorted picture of likelihood that a firm will exclude an item, since the likelihood of exclusion should be conditional on whether the item is reported at all. Thus, some items that appear to be rarely excluded in Column (6) are actually quite commonly excluded. For example, according to Column (6), the frequency of excluding litigation/settlement costs is 24%. This number, however, is significantly underestimated as only 26% of firms report the item. Column (4) shows that actually 94% of reporting firms exclude litigation/settlement costs.

Panel B of Table 1 presents the most popular exclusion combinations. This panel indicates that EBITDA combinations are commonly excluded together. In addition, more uncommon exclusions are often combined with tax impacts.

[Figure 1 and Table 1]

Figure 2 provides a histogram of the frequency of exclusions by quality and by year. There are two points to note. First, the total number of exclusions made by S&P 500 firms steadily increases each year and has more than doubled, from 1,016 to 2,257, during the period 2013–2017. Second, out of all the exclusion quality categories, low-quality exclusions have the highest growth from 2013 to 2017, that is, a 138 percent increase from 249 to 592 exclusions. The number of *High Quality* exclusions increased by 118 percent from 160 to 349 during the same period, which is roughly in line with the growth in the number of exclusions in the *Medium Low*, *Neutral*, and *Medium High* exclusion quality categories. Both *High Quality* and *Low Quality* categories consist of 4 unique identifiable exclusion items.

Panel A of Figure 3 plots the frequency of individual exclusions. For each exclusion, 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. The top four most frequent income-increasing exclusions are Merger/Acquisition Costs,

Depreciation and Amortization, Restructuring Charges, and Impairment on PPE and Intangible Assets.

Panel B of Figure 3 plots the average magnitude of each individual exclusion. The magnitude of exclusion is measured as the exclusion divided by the absolute value of GAAP earnings. This figure provides insights into whether our quality score is just ranking on the relative magnitude of exclusions. It clearly shows that this is not the case since the magnitude of exclusions vary considerably across and within each quality category. The top four exclusions with the highest impact on non-GAAP earnings are Depreciation and Amortization (*Low Quality*), Impairment on PPE and Intangible Assets (*Neutral Quality*), Net Interest Expense (*Low Quality*), and Stock Compensation Expense (*Medium Low Quality*). None of the four are classified as high-quality exclusions. The average magnitude of Depreciation and Amortization is 1.036 (see Panel A of Table 1), suggesting that firms exclude depreciation and amortization expenses that are of a magnitude comparable to their GAAP earnings. The average magnitude of interest expense and stock compensation expense is around 54 and 42 percent of GAAP earnings, respectively.

[Figure 2 and Figure 3]

Overall, our descriptive evidence suggests that the exclusion of recurring expenses (i.e., low-quality exclusions) is frequent and has a higher magnitude impact on non-GAAP earnings than the exclusion of transitory items (i.e., high-quality exclusions). This evidence challenges the conventional notion that non-GAAP exclusions usually involve more non-recurring items than recurring ones (e.g., Kolev, Marquardt, and McVay 2008; Bradshaw et al. 2018; Black et al. 2018; Whipple 2015) and highlights new and evolving trends in non-GAAP reporting.

4.3 Analysis of the Non-GAAP Exclusion Quality Score

Table 2 provides our descriptive evidence on non-GAAP reporting consistency. Panel A of Table 2 reports summary statistics for the composite exclusion quality score. The median and mean values are 2.7, which indicates the overall quality of non-GAAP reporting is between medium low and neutral. This is consistent with the observation that neutral-quality exclusions outnumber all other categories (Figure 2). The standard deviation of the exclusion quality score is 0.9, with an interquartile range from 1.9 to 3.3.

Panel B of Table 2 presents the transition matrix for a firm's non-GAAP exclusion quality score in two consecutive years. We sort firm-year observations into five groups (i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*) based on the quintile ranks of exclusion quality score by year.

Firms with an exclusion quality score below the 20th percentile are labeled as firms with *Low* non-GAAP exclusion quality. Firms with exclusion quality score above the 80th percentile are labeled as firms with *High* non-GAAP exclusion quality. We report the number of firms for each combination of current and prior year's exclusion quality group. We find that within each current year's quality group, most firms are in that same exclusion quality group in the prior year. If exclusion quality scores were random, then we would expect 20 percent of firms to stay in the same group. The results, however, indicate more than 44 percent of firms stay in the same exclusion quality group for two consecutive years, suggesting that a large portion of firms adopt consistent non-GAAP reporting practices year over year. This evidence is consistent with our expectation that exclusion quality scores are serially correlated over time due to firm consistently excluding certain items.

To mitigate the concern that non-GAAP exclusion quality might merely capture earnings persistence, we examine the correlation among exclusion quality score, non-GAAP earnings persistence, and GAAP earnings persistence. Panel C of Table 2 reports the results. We find a Pearson correlation coefficient of 0.06 (without statistical significance) between our exclusion quality score and non-GAAP earnings persistence, suggesting that higher exclusion quality does not necessarily indicate higher non-GAAP earnings persistence. We also find a negative correlation between our exclusion quality score and GAAP earnings persistence. Overall, there is not a strong relation between our measure of exclusion quality and earnings persistence, suggesting the exclusion quality metric is not merely proxying for earnings persistence.

[Table 2]

Table 3 provides descriptive evidence regarding non-GAAP reporting comparability. It reports the distribution of non-GAAP exclusion quality scores by (Fama-French 30) industry. We classify industries into groups based on the median value of exclusion quality scores. The three industries with the lowest exclusion quality (a score lower than 2) are Real Estate Investment Trusts, Mining, and Recreation. The three industries with the highest exclusion quality (a score higher than 3.2) are Wholesale, Business Supplies and Shipping Containers, and Consumer Goods. In unreported tests, we investigate the items driving these scores. We find that firms within the same industry tend to have similar exclusion quality scores as they exclude many similar items. For example, almost all firms in the Real Estate Investment Trusts industry tend to exclude depreciation; more than half of firms in Personal and Business Services exclude stock compensation; and more than half of firms in Banking, Insurance, Real Estate, and Trading exclude fair value gains and losses. We also find that within-industry variation in exclusion quality scores is lower than the variation for the full sample.

The difference in standard deviations is –5.9% (t-statistic = –2.51). This evidence is consistent with our expectation that industries will vary in their exclusion quality scores because firms in the same industry exclude similar items for comparability purposes.

[Table 3]

4.4 Non-GAAP Exclusion Quality, Market Pressure, and the Need to Beat Expectations

Table 4 provides evidence with respect to *Prediction 1* that examines the relation between market pressure and exclusion quality. Panel A of Table 4 presents the mean values of a range of characteristics of our sample firms that are classified into five groups by exclusion quality. We first report measures of Non-GAAP exclusions. Consistent with our discussion of Figure 2, low-quality firms tend to use more exclusions, and their total exclusions are almost twice the size of absolute GAAP earnings and are significantly larger in magnitude than those of the high-quality group. We create an indicator variable *I(Non-GAAP > EBITDA)*, which equals 1 when non-GAAP earnings is higher than EBITDA. Approximately 44% of low-quality firms are reporting non-GAAP earnings greater than EBITDA, while this number is only 3% for high-quality firms. We next report operating performance metrics. The low-quality group has significantly higher sales growth but lower profitability relative to the other groups. There is, however, no significant variation in cash flows or the likelihood of reporting losses across groups.

Next, we report the market pressure metrics. Consistent with *Prediction 1*, we find that the low-quality group faces stronger market pressure. Specifically, the low-quality firms have higher past stock returns, higher target price implied returns, higher institutional holdings, and lower earnings to price ratios. These firms are also more highly leveraged. Interestingly, their managers appear to have a stronger incentive to meet expectations since these firms also have relatively higher stock compensation. The low-quality firms are also younger in age and smaller in size. These findings suggest that low-quality firms have stronger incentives to meet market expectations and provide circumstantial evidence for their adoption of low-quality non-GAAP exclusions. Finally, we report financial reporting quality metrics. We do not find evidence that our non-GAAP exclusion quality score is associated with the F-score, absolute accruals, or discretionary accruals (e.g., Dechow, Ge, Larson, and Sloan 2011; Kothari, Leone, and Wasley 2005). This finding mitigates the concern that our measure of non-GAAP exclusion quality can be explained by measures of earnings quality.

Panel B of Table 4 presents OLS regressions of the exclusion quality score on various firm characteristics. We focus on the results that are robust in both univariate and multivariate analyses. Consistent with the univariate analysis in Panel A, firms with a higher magnitude of total exclusions

have lower exclusion quality scores. In addition, firms with lower exclusion quality scores are more likely to report non-GAAP earnings higher than EBITDA. We find that younger firms, high sales growth firms, and highly leveraged firms are more likely to report non-GAAP earnings with low exclusion quality. This suggests that these firms use discretion in non-GAAP exclusions to portray a rosy picture of firm performance. Finally, lower exclusion quality is associated with higher past stock returns, consistent with the market pressure affecting a firm's decision to make lower quality non-GAAP exclusions.

[Table 4]

To test *Prediction 2*, we identify scenarios where managers' non-GAAP earnings metric meets or beats analyst consensus forecasts while the actual earnings metric reported in I/B/E/S miss the consensus forecasts (e.g., Chen et al. 2021). We label such scenarios as discretionary beat. Prior research documents managerial opportunism in non-GAAP reporting for the purpose of meeting and beating analyst forecasts (e.g., Black and Christensen 2009; Frankel, McVay, and Soliman 2011; Brown et al. 2012; Doyle, Jennings, and Soliman 2013). Thus, we expect that firms with lower exclusion quality are more likely to have discretionary beats.

Panel A of Table 5 reports logistic regression results of *Discretionary Beat* on our non-GAAP exclusion quality score. We find that the coefficient on *Exclusion Quality Score* is –0.206, significant at the 0.05 level (z-statistic = –2.11), suggesting that firms with higher exclusion quality are less likely to use non-GAAP exclusions to beat analysts' forecasts. This result is consistent with *Prediction 2*. In terms of economic significance, a one-unit increase in our non-GAAP exclusion quality score translates to a 19 percent (= $1 - e^{-0.206}$) decline in the likelihood of discretionary beat. Moreover, we confirm that firms with higher magnitudes of total exclusions tend to have higher odds of discretionary beat (coefficient = 0.055, z-statistic = 2.31), which is consistent with prior findings (e.g., Doyle, Jennings, and Soliman 2013; Chen et al. 2021).

Recall that for firms that report multiple non-GAAP earnings metrics, we select the most aggressive non-GAAP earnings metric when we determine a firm's non-GAAP exclusion quality score. The most aggressive non-GAAP earnings metric that a firm can report is typically some measure of adjusted EBITDA. However, in press releases, firms are required to report the non-GAAP metric that most closely aligns with their GAAP metric. GAAP EPS will first be compared to non-GAAP EPS, followed by adjusted EBITDA, which is typically discussed a few lines later in the press releases. Note that while non-GAAP EPS can differ from the measurement of street EPS (the non-GAAP EPS number forecasted by analysts), both of them are calculated after tax. In contrast, EBITDA is before tax.

Therefore, one concern with the results reported in Panel A is that our use of adjusted EBITDA to determine a discretionary beat could mechanically induce our findings. In other words, a firm's EBITDA is more likely to beat analysts' forecasts than non-GAAP EPS. To address this concern, we provide additional robustness results in Panel B of Table 5. Columns (1) and (2) provide results where we exclude all firms that report an adjusted EBITDA non-GAAP metric (approximately 18 percent of the sample). Columns (3) and (4) provide results where we recalculate the *Exclusion Quality Score* based on the firm's non-GAAP EPS metric instead of adjusted EBITDA. We find that the negative association between *Exclusion Quality Score* and *Discretionary Beat* continues to hold.

[Table 5]

4.5 Non-GAAP Exclusion Quality and the Reaction of Financial Information Users

We next investigate the implications of non-GAAP exclusion quality for financial information users. We focus on three types of users: regulators, analysts, and investors.

Does non-GAAP exclusion quality predict future regulatory attention? To answer this question, 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 in the future. 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. Table 6 reports logistic regression results of regulatory outcomes on the exclusion quality score. Consistent with *Prediction 3*, the coefficient on *Exclusion Quality Score* is negative and significant, suggesting that firms with higher non-GAAP exclusion quality scores are less 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) and (2) (coefficient = −0.227, z-statistic = −2.28), a one-unit increase in the exclusion quality score is associated with a 20 percent (= $1 - e^{-0.227}$) reduction in the likelihood of receiving SEC comment letters. Based on the estimation in Columns (3) and (4) (coefficient = −0.396, z-statistic = −2.43), a one-unit increase in the exclusion quality score is associated with a 33 percent (= $1 - e^{-0.396}$) decrease in the odds of having Regulation G violations. In addition, we find that 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 higher levels of regulatory scrutiny. These results also validate that the construction of our non-GAAP exclusion quality score accurately captures regulators' view of non-GAAP exclusion quality.

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[Table 6]

When managers' non-GAAP adjustment choices are more discretionary or less appropriate from analysts' point of view, analysts will have more diverse opinions about the non-GAAP adjustments they should include, and therefore the forecast dispersion is likely to be higher. To test *Prediction 4*, 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 7 reports the regression results. Consistent with *Prediction 4*, we find a negative and significant relation between our score and forecast dispersion (coefficient = –0.026, *t*-statistic = –2.28), suggesting that for firms with lower non-GAAP exclusion quality, their analysts appear to provide forecasts with greater dispersion before earnings announcements.

It is important to note that the coefficient on *Total Exclusion/GAAP* is not significant (coefficient = –0.001, *t*-statistic = –0.22), suggesting that analyst forecast dispersion is not affected by the magnitude of non-GAAP exclusions relative to GAAP earnings. Recall from Table 6 that the magnitude of non-GAAP exclusions does not explain future regulatory outcomes either. Collectively, these findings indicate that regulators and analysts pay more attention to the quality of non-GAAP exclusions rather than the magnitude of these exclusions.

[Table 7]

We next explore whether investors' response to earnings announcements vary with firms' non-GAAP exclusion quality 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 if exclusion quality is compromised. 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. Table 8 reports the regression results. Consistent with *Prediction 5*, the coefficients on *Exclusion Quality Score* are positive and significant over both a five-day and ten-day measurement window following the earnings announcement, suggesting that firms with higher non-GAAP exclusion quality have speedier price discovery. For example, the coefficient on *Exclusion Quality Score* is 0.022 with a *t*-statistic of 2.45 for price discovery over the first five trading days after earnings announcements. In terms of economic significance, a one-unit increase in the exclusion quality score is associated with an 2% increase in the efficiency of price discovery, which represents 3.6 percent of its mean value. This result is comparable to the findings of prior studies (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 = –2.70), 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.

[Table 8]

5. Conclusion

Our study provides a comprehensive and granular picture of the use of non-GAAP exclusions among large firms in recent years. We build on prior research and show that there continues to be an increasing trend in the number of non-GAAP exclusions reported by large U.S. firms. We also find that the frequency and magnitude of recurring exclusions markedly exceed non-recurring items, and that firms have greater discretion in their non-GAAP adjustment choices. Thus, users of financial information, such as analysts, investors, and regulators, are increasingly facing a situation where firms are excluding a larger variety of items. This makes the interpretation of earnings news difficult since a user must decide on their own which items should be legitimately excluded and which ones should not.

We propose a new measure of non-GAAP exclusion quality with the aim of helping users understand the quality of exclusions. Our measure of exclusion quality considers the economic nature, accounting measurement, valuation impact, and exclusion magnitude of individual exclusions, and aggregates this information into one summary score. We document that our metric captures a unique dimension of non-GAAP reporting quality that is not explained by other measures of earnings quality and financial reporting quality such as accruals or earnings persistence. We show that our classification of exclusion quality is largely consistent with "third-party" academics' and analysts' view of non-GAAP exclusions. We also demonstrate that items that we consider high-quality exclusions line up with many of the items the China Securities Regulatory Committee (CSRC) require to be separately disclosed to help investors obtain a more accurate view of firms' operating performance.

We document that firms with lower non-GAAP exclusion quality are more likely to face stronger market pressure to meet analysts' forecasts, and that low-quality exclusions enable firms to beat consensus earnings even though its street earnings miss expectations. We show that our non-GAAP exclusion quality score predicts future SEC scrutiny and enforcement actions on non-GAAP

earnings. We also provide evidence 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. Taken together, through a variety of tests, we consistently show that our non-GAAP exclusion quality score identifies a measure of reporting quality that is unique from other available measures.

Our metric is potentially useful to both investors and analysts since it provides a parsimonious way to compare firms that are excluding different items. Our metric is also potentially useful as a screening tool for regulators or other market participants concerned with exclusion quality. We also hope that our metric will be useful to future research that can employ a parsimonious measure of exclusion quality in a variety of other settings and contexts.

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Exhibit 1
Exclusion Quality of Individual Non-GAAP Exclusions

This table presents the classification of individual items excluded from non-GAAP earnings and its first-order autocorrelation coefficients. We obtain 25 non-GAAP individual exclusions from Audit Analytics for S&P 500 firms between 2013 and 2017, of which 5 exclusions do not have corresponding values from Compustat. We classify the 25 exclusions into five categories based on the exclusion quality, i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*. Appendix 2 discusses the exclusion quality categorization based on the economic nature and accounting measurement of individual exclusions. We estimate the first-order autocorrelation coefficients for each exclusion using all firm-year observations with available data on Compustat. The coefficients are estimated from regressions of each exclusion on its prior year values annually over the period from 2000 to 2021 and averaged using the Fama-MacBeth (1973) approach. The first-order autocorrelation coefficients are not available for exclusions without corresponding Compustat value. All variables are scaled by average total assets.

	Score	Category	Exclusion item	AR1
Low exclusion quality	1	Low	*Depreciation and amortization*	0.711
			Net interest expenses	0.887
			Rent and lease expense/adjustments	0.658
			R&D expenses	0.811
			Others (unidentified)	
	2	Medium Low	*Pension-related expense/adjustments*	0.834
			Stock compensation expenses	0.763
			Inventory write-downs	0.144
			Realized gains/losses on investment securities	0.149
	3	Neutral	*Tax impact of exclusions*	
			Deferred revenue	0.042
			Foreign currency gains/losses	0.064
			Impairment on PP&E and intangible assets	0.144
			Equity income from unconsolidated subsidiaries	0.679
			Gains/losses on sale of PP&E	0.123
			Unrealized fair value adjustments from trading securities	0.138
	4	Medium High	*Executive severance or termination costs*	
			Merger/acquisition costs	0.269
			Debt extinguishment/Refinancing costs	0.231
			New initiatives and start-up costs	
			Restructuring charges	0.116
High exclusion quality	5	High	*Tax and accounting rule changes - unusual/one time*	
			Discontinued operations	0.084
			Litigation/settlement costs	0.146
			Income attributable to non-controlling interests	0.319

Exhibit 2
Computation of Non-GAAP Exclusion Quality Score

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

Example 1: Johnson & Johnson (Ticker: JNJ)

Panel A: Reconciliation between non-GAAP earnings 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 items	(1) Exclusion quality score	(2) Exclusion amount (millions)	(3) Absolute exclusion amount (millions)	(4) % of total exclusions	(1) x (3) Weighted exclusion quality score
Tax and 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	5	955	955	5%	0.25
Merger/acquisition costs	4	767	767	4%	0.16
Restructuring charges	4	595	595	3%	0.13
R&D expenses	1	266	266	1%	0.01
Impairment on PP&E and intangible assets	3	4	4	0%	0.00
Merger/acquisition costs	4	116	116	1%	0.02
Total for 7 exclusions	27	18,740	18,740	100%	4.33
Weighted average exclusion quality score					4.33
Exclusion quality group					*High Quality*

Exhibit 2 (continued)

Example 2: Transdigm Group Inc. (Ticker: TDG)

Panel C: Reconciliation between non-GAAP earnings 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 items	(i) Exclusion quality score	(ii) Exclusion amount ('000s)	(iii) Absolute exclusion amount ('000s)	(iv) % of total exclusions	(i) x (iii) Weighted exclusion quality score
Discontinued operations	5	(31,654)	31,654	3%	0.14
Depreciation and amortization	1	141,025	141,025	13%	0.13
Net interest expenses	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 expenses	2	45,524	45,524	4%	0.08
Debt extinguishment/Refinancing costs	4	39,807	39,807	4%	0.14
Others (unidentified)	1	12,997	12,997	1%	0.01
Total for 8 exclusions	16	1,050,368	1,113,676	100%	1.72
Weighted average exclusion quality score					1.72
Exclusion quality group					*Low Quality*

Exhibit 3
Comparing Non-GAAP Exclusion Quality Score with Exclusion Suggestions from the China Securities Regulatory Committee

This exhibit presents the individual non-GAAP exclusions suggested by the China Securities Regulatory Committee (CSRC) (Source: http://www.csrc.gov.cn/csrc_en/c102034/c1371419/content.shtml). Column (1) lists the suggested non-GAAP exclusions by the CSRC. Column (2) presents the corresponding item based on our exclusion taxonomy presented in Exhibit 1, if available. Column (3) presents our categorization of exclusion quality for individual non-GAAP exclusions as defined in Exhibit 1.

	(1) CRSC non-GAAP exclusion	(2) US non-GAAP exclusion	(3) Exclusion quality
1	Gain or loss on disposal of noncurrent assets	Gains/losses on sale of PP&E	Neutral
2	Unusual tax refund or tax refund without proper authorization	Tax and accounting rule changes - unusual/one time	High
3	Government subsidy, excluding core and operation related subsidy	Tax and accounting rule changes - unusual/one time	High
4	Fees collected from non-financial enterprises		
5	Income from the lower investment cost compared to recognizable net assets in acquiring equity ownership	Equity income from unconsolidated subsidiaries	Neutral
6	Income from exchange of non-monetary assets		
7	Income from assets under management by others		
8	Provision for asset impairment due to non-controllable forces	Impairment on PP&E and intangible assets	Neutral
9	Gain/loss from debt restructuring	Debt extinguishment/Refinancing costs	Medium High
10	Fees from merger/acquisition	Merger/acquisition costs	Medium High
11	Gain/loss from non arm-length transactions		
12	Income from the partial period before merger/acquisition	Merger/acquisition costs	Medium High
13	Income from contingent events not related to core operations		
14	Unrealized gain/loss from trading securities, gain/loss from disposing investments accounted using fair-value method	Unrealized fair value adjustments from trading securities	Neutral
15	The reversal of accounts receivable allowance		
16	Income from entrust loans		
17	Unrealized gain/loss from real estate investment property under fair-value method	Unrealized fair value adjustments from trading securities	Neutral
18	Income adjustment from accounting policy change	Tax and accounting rule changes - unusual/one time	High
19	Income from custodian services		
20	All the other items in "other income" and "other losses"		
21	All other earnings items that meet the requirements of "nonrecurring earnings"		

Exhibit 4
Comparing Non-GAAP Exclusion Quality Scores and Analyst Survey Responses

This exhibit presents analysts' ratings of the quality of individual non-GAAP exclusions. Survey ratings range from 1 to 5, with 1 being the lowest-quality, and 5 being the highest-quality non-GAAP exclusion. Panel A Column (1) reports the exclusion quality score as defined in Exhibit 1, Column (2) the average academic rating for each exclusion item, and Column (3) the average analyst rating for each exclusion item. Panel B reports the Pearson (below the diagonal) and Spearman (above the diagonal) correlation coefficients between exclusion quality scores, academic ratings, and analyst ratings. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Panel A: Survey exclusion quality ratings.

Exclusion items	(1) Exclusion Quality Score	(2) Academic rating	(3) Analyst rating
Depreciation and amortization	1	1.7	2.0
Net interest expenses	1	1.4	2.8
Rent and lease expense/adjustments	1	1.1	2.0
R&D expenses	1	1.7	2.5
Others (unidentified)			
Pension-related expense/adjustments	2	1.9	2.5
Stock compensation expenses	2	1.6	3.0
Inventory write-downs	2	2.6	2.8
Realized gains/losses on investment securities	2	2.3	2.8
Tax impact of exclusions	3	3.0	3.0
Deferred revenue	3	1.8	3.5
Foreign currency gains/losses	3	2.9	3.0
Impairment on PP&E and intangible assets	3	2.8	2.3
Equity income from unconsolidated subsidiaries	3	2.6	3.3
Gains/losses on sale of PP&E	3	3.3	2.5
Unrealized fair value adjustments from trading securities	3	3.1	3.8
Executive severance or termination costs	4	3.1	2.3
Merger/acquisition costs	4	3.6	3.3
Debt extinguishment/Refinancing costs	4	3.0	3.0
New initiatives and start-up costs	4	2.8	3.3
Restructuring charges	4	3.6	2.8
Tax and accounting rule changes	5	3.8	3.8
Discontinued operations	5	4.1	3.5
Litigation/settlement costs	5	3.2	2.8
Income attributable to non-controlling interests	5	2.9	3.3

Panel B: Pearson and Spearman correlation matrix.

	(1)	(2)	(3)
(1) Exclusion Quality Score		0.84***	0.55***
(2) Academic rating	0.86***		0.41***
(3) Analyst rating	0.57***	0.49**	

Figure 1
Frequency of Non-GAAP Exclusions

This figure presents the frequency of non-GAAP exclusions for our sample firms. Our main sample includes 1,665 firm-year observations between 2013 and 2017. Panel A plots the number of firm-year observations by the total number of items excluded from non-GAAP earnings per year. Panel B plots the percentage of firms excluding the item out of the number of firms reporting the corresponding item in GAAP earnings.

Panel A: Frequency of firm-years by total number of non-GAAP exclusions.
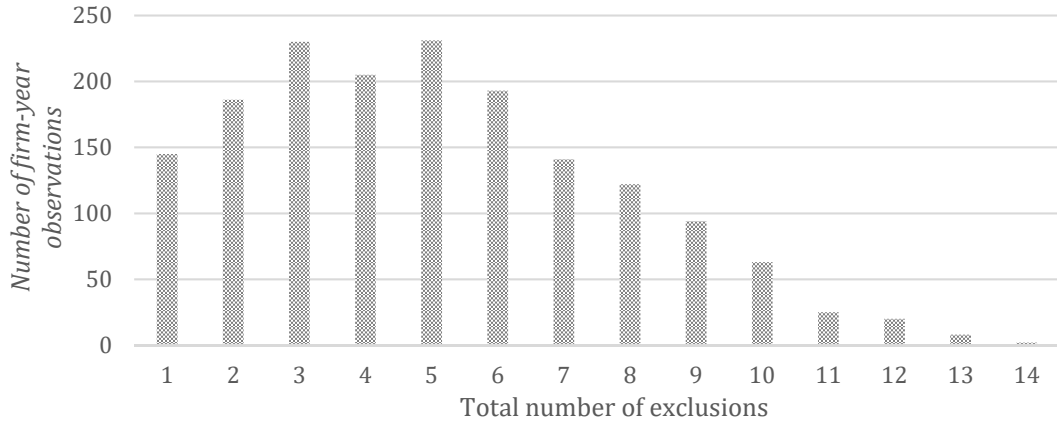
Panel B: Percentage of firms excluding the item relative to those reporting the item.

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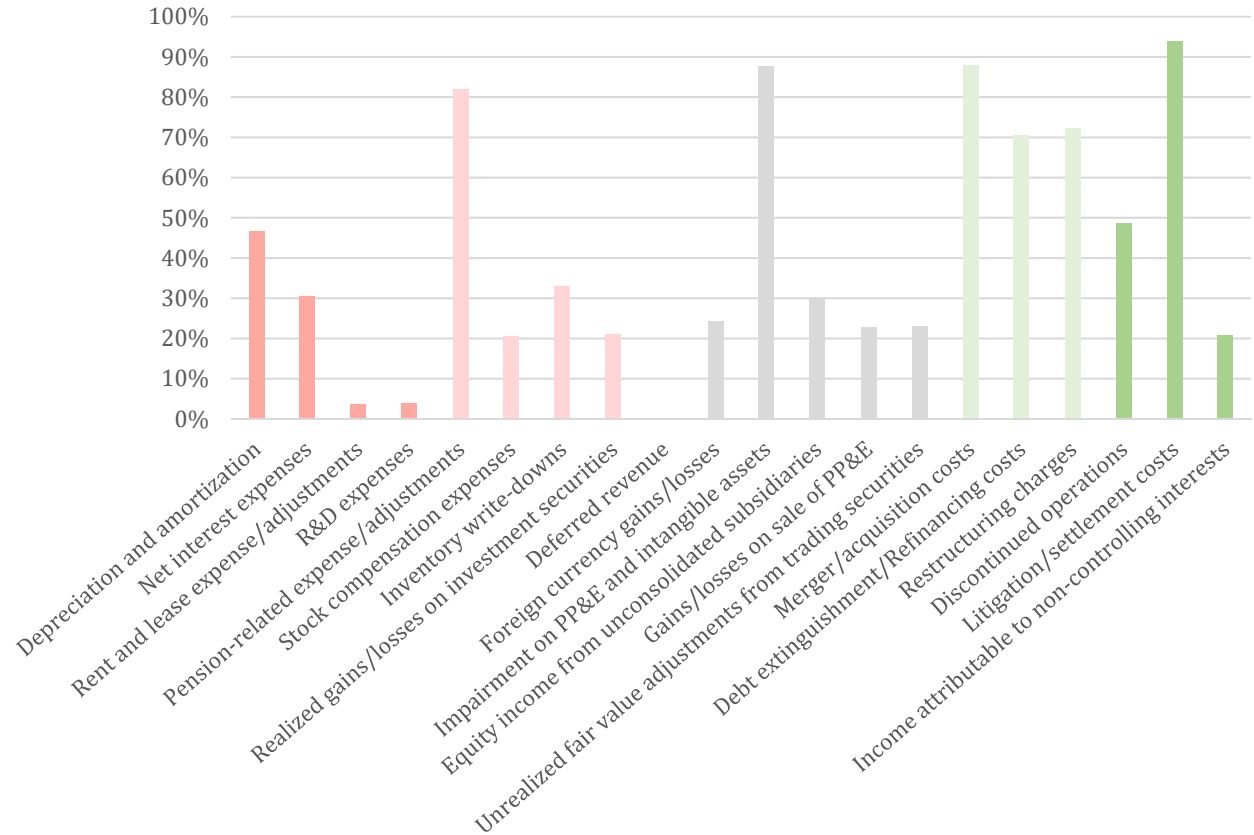
Figure 2
Distribution of Individual Non-GAAP Exclusions

This figure presents the distribution of non-GAAP individual exclusions used by our sample firms. It reports the number of non-GAAP exclusions per year by exclusion quality category. This sample includes 8,413 individual exclusions between 2013 and 2017.
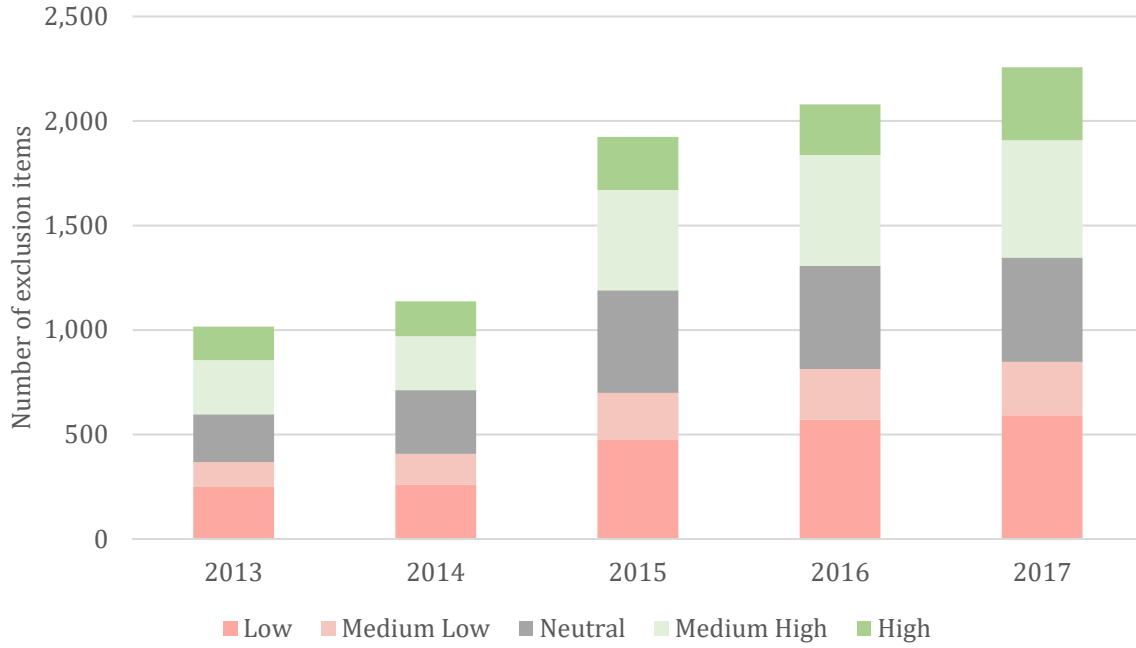
Figure 3
Distribution of Non-GAAP Exclusion Types

This figure presents the distribution of non-GAAP individual exclusions used by our sample firms. This sample includes 8,413 individual exclusions between 2013 and 2017. Panel A presents the frequency of income-decreasing and income-increasing exclusions by exclusion type. Panel B presents the average magnitude of income-decreasing and income-increasing exclusions by exclusion type. The magnitude of exclusion is measured as the exclusion divided by the absolute value of GAAP net income.

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

Income-decreasing exclusions   *Income-increasing exclusions*

- Depreciation and amortization
- Net interest expenses
- Rent and lease expense/adjustments
- R&D expenses
- Others (unidentified)
- Pension-related expense/adjustments
- Stock compensation expenses
- Inventory write-downs
- Realized gains/losses on investment securities
- Tax impact of exclusions
- Deferred revenue
- Foreign currency gains/losses
- Impairment on PP&E and intangible assets
- Equity income from unconsolidated subsidiaries
- Gains/losses on sale of PP&E
- Unrealized fair value adjustments from trading securities
- Executive severance or termination costs
- Merger/acquisition costs
- Debt extinguishment/Refinancing costs
- New initiatives and start-up costs
- Restructuring charges
- Tax and accounting rule changes
- Discontinued operations
- Litigation/settlement costs
- Income attributable to non-controlling interests

Number of exclusions

Figure 3 (continued)

Panel B: Magnitude of exclusions (exclusion scaled by absolute GAAP earnings).

Average magnitude of exclusions

Table 1
Descriptive Statistics of Individual Non-GAAP Exclusions

This table presents summary statistics for individual non-GAAP exclusions for our sample firms between 2013 and 2017. Our sample includes 1,665 firm-year observations and 8,413 individual exclusions between 2013 and 2017. In Panel A, Column (1) reports the average magnitude of exclusions. The magnitude of the exclusion is measured as the exclusion divided by the absolute value of GAAP net income. Column (2) reports the number of firms excluding the item from non-GAAP earnings. Column (3) reports the number of firms reporting 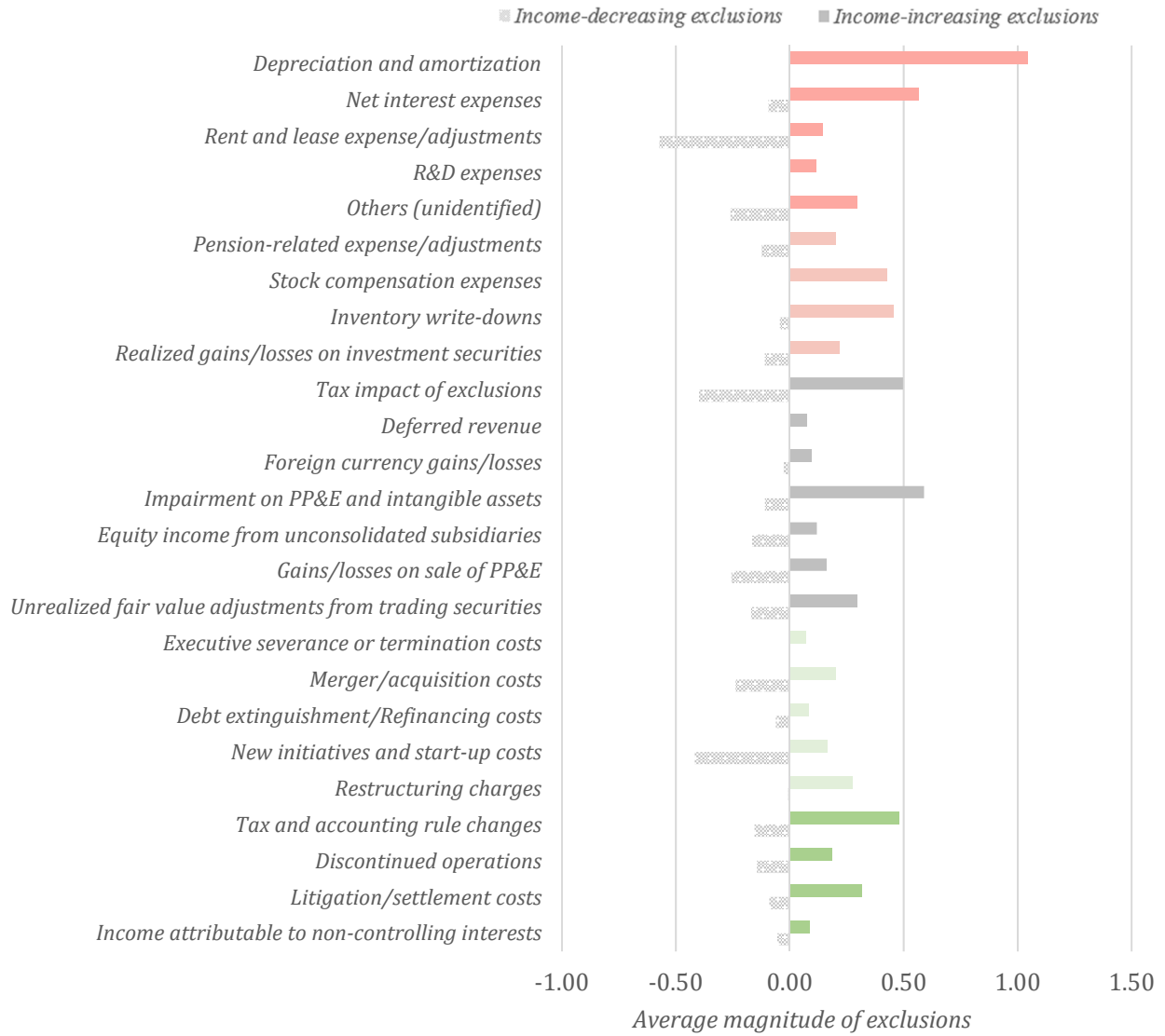the corresponding item for GAAP earnings. Column (4) reports the percentage of firms excluding the item out of the total number of firms in our sample. Column (5) reports the percentage of firms excluding the item out of the number of firms reporting the corresponding item for GAAP earnings. We identify the excluding firms using Audit Analytics and reporting firms using Compustat. For individual exclusions without corresponding values from Compustat, we do not report values in Column (3) and (5). Panel B presents the popular combinations of items that are simultaneously excluded from non-GAAP earnings. We report the correlation coefficients between indicators for the exclusion of each individual item. We report exclusion combinations with pairwise correlation coefficients greater than 20 percent and statistical significance at least at the 0.10 level.

Panel A: Frequency and magnitude of individual exclusions.

Exclusion item	(1) Average magnitude of the exclusion	(2) N firms excluding the item	(3) N firms reporting the item	(4) Relative % firms excluding the item (2)/(3)	(5) % firms reporting the item (3)/1,665	(6) % firms excluding the item (2)/1,665
Depreciation and amortization	1.036	735	1,578	46.58%	94.77%	44.14%
Net interest expense	0.537	483	1,591	30.36%	95.56%	29.01%
Rent and lease expense/adjustments	−0.366	57	1,567	3.64%	94.11%	3.42%
R&D expense	0.116	27	725	3.72%	43.54%	1.62%
Others (unidentified)	0.149	848				50.93%
Pension-related expense/adjustments	0.140	279	341	81.82%	20.48%	16.76%
Stock compensation expense	0.418	339	1,647	20.58%	98.92%	20.36%
Inventory write-downs	0.374	113	342	33.04%	20.54%	6.79%
Realized gains/losses on investment securities	0.035	256	1,223	20.93%	73.45%	15.38%
Tax impact of exclusions	0.098	758				45.53%
Deferred revenue	0.076	1	617	0.16%	37.06%	0.06%
Foreign currency gains/losses	0.076	159	657	24.20%	39.46%	9.55%
Impairment on PP&E and intangibles	0.568	560	639	87.64%	38.38%	33.63%
Equity income from unconsolidated subs.	0.014	230	759	30.30%	45.59%	13.81%
Gains/losses on sale of PP&E	−0.091	81	357	22.69%	21.44%	4.86%
Unrealized fair value adjustments from trading securities	0.088	215	933	23.04%	56.04%	12.91%
Executive severance or termination costs	0.070	76				4.56%
Merger/acquisition costs	0.103	966	1,099	87.90%	66.01%	58.02%
Debt extinguishment/Refinancing costs	0.067	325	461	70.50%	27.69%	19.52%
New initiatives and start-up costs	0.150	77				4.62%
Restructuring charges	0.266	653	904	72.23%	54.29%	39.22%
Tax and accounting rule changes	0.185	371				22.28%
Discontinued operations	0.068	215	443	48.53%	26.61%	12.91%
Litigation/settlement costs	0.235	403	429	93.94%	25.77%	24.20%
Income attributable to non-controlling interests	0.038	186	900	20.67%	54.05%	11.17%

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Table 1 (continued)

Panel B: Frequent exclusion combinations.

Exclusion 1	Score	Exclusion 2	Score	Correlation
Net interest expenses	1	Tax impact of exclusions	3	55.54%
Depreciation and amortization	1	Net interest expenses	1	50.77%
Depreciation and amortization	1	Tax impact of exclusions	3	37.75%
Net interest expenses	1	Income attributable to non-controlling interests	5	35.86%
Income attributable to non-controlling interests	5	Tax Impact of exclusions	3	28.81%
Net interest expenses	1	Equity income from unconsolidated subsidiaries	3	27.32%
Equity income from unconsolidated subsidiaries	3	Income attributable to non-controlling interests	5	25.59%
Merger/acquisition costs	4	Restructuring charges	4	21.07%
Restructuring charges	4	Litigation/settlement costs	5	20.71%
Equity income from unconsolidated subsidiaries	3	Tax impact of exclusions	3	20.56%
Net interest expenses	1	Debt extinguishment/Refinancing costs	4	20.18%
Debt extinguishment/Refinancing costs	4	Tax impact of exclusions	3	20.04%

Table 2
Descriptive Statistics and Persistence of Exclusion Quality

This table presents descriptive statistics for the composite non-GAAP exclusion quality score and its association with measures of earnings persistence. Panel A provides summary statistics for the *Exclusion Quality Score* that we develop in this study, and the aggregate number and magnitude of non-GAAP exclusions. *Exclusion Quality Score* ranges from 1 to 5 (continuous) and is calculated based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development. Our main sample includes 1,665 firm-year observations between 2013 and 2017. All variables are defined in Appendix 1. Panel B presents the distribution of firms by exclusion quality of the prior and current year for our sample firms. We sort firm-year observations into five groups (i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*) based on the quintile ranks of exclusion quality scores by year. Firms with exclusion quality scores below the 20th percentile, between the 20th and 40th percentiles, between the 40th and 60th percentiles, between the 60th and 80th percentiles, and above the 80th percentile are labeled as firms with *Low, Medium Low , Neutral , Medium High* , and *High* non-GAAP exclusion quality, respectively. We report the number of firms by the intersection between the exclusion quality of the prior and current year. Panel C 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. We estimate the persistence of both non-GAAP and GAAP earnings for each firm in our sample. They are estimated as the first-order autocorrelation coefficient from regressions of earnings on its prior year values over our sample period 2013–2017. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Panel A: Summary statistics.

Variables	Mean	Std Dev.	Percentiles		
			25th	50th	75th
Exclusion Quality Score	2.679	0.920	1.934	2.728	3.278
Number of Exclusions	5.053	2.744	3.000	5.000	7.000
Total Exclusion/GAAP	1.264	2.685	0.065	0.391	1.348

Panel B: Persistence of exclusion quality.

		Current year exclusion quality (*N* =1,133 firm-year obs.)					
		Low	Medium Low	Neutral	Medium High	High	Total
Prior year exclusion quality	Low	**85**	47	19	15	11	177
	Medium Low	42	**142**	49	24	11	268
	Neutral	23	39	**119**	56	33	270
	Medium High	10	25	63	**75**	47	220
	High	11	13	32	62	**80**	198
	Total	171	266	282	232	182	1,133

Panel C: Pearson and Spearman correlation matrix.

	(1)	(2)	(3)
(1) *Exclusion Quality Score*		0.07*	-0.11***
(2) Non-GAAP earnings persistence	0.06		0.21*
(3) GAAP earnings persistence	-0.11***	0.39*	

Table 3
Exclusion Quality Score by Industry

This table presents distribution of exclusion quality scores by (Fama-French 30) industry for our sample firms. Our main sample includes 1,665 firm-year observations between 2013 and 2017. We require at least 10 observations for each industry. We develop a firm-year measure of non-GAAP exclusion quality, *Exclusion Quality Score*, based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development. We classify industries into groups based on the median value of exclusion quality scores. Industries with a median score of less than 2, between 2 and 2.5, between 2.5 and 3, and above 3 are classified as having *Low*, *Medium Low*, *Medium High*, and *High* exclusion quality, respectively. The bottom rows compare the sample standard deviation and the average industry standard deviation of *Exclusion Quality Score*. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Industry	N	Mean	Median	Std. Dev.
Low exclusion quality				
Real Estate Investment Trusts	86	1.689	1.441	0.650
Precious Metals, Non-Metallic, and Industrial Metal Mining	16	1.963	1.805	0.531
Recreation	13	2.103	1.938	0.826
Medium Low exclusion quality				
Personal and Business Services	149	2.312	2.076	0.807
Communication	65	2.405	2.170	0.897
Electrical Equipment	10	2.837	2.265	1.033
Construction and Construction Materials	31	2.576	2.317	1.053
Chemicals	38	2.636	2.327	0.895
Medium High exclusion quality				
Aircraft, ships, and railroad equipment	20	2.596	2.601	0.916
Healthcare, Medical Equipment, Pharmaceutical Products	167	2.739	2.682	0.788
Beer & Liquor	12	2.405	2.686	0.897
Petroleum and Natural Gas	134	2.524	2.810	0.749
Everything Else	41	2.614	2.842	0.947
Retail	55	2.766	2.903	0.938
Restaurants, Hotels, Motels	18	2.772	2.906	0.771
Banking, Insurance, Real Estate, Trading	228	2.870	2.930	0.912
Transportation	40	2.597	2.934	0.806
Business Equipment	147	2.791	2.958	0.840
Automobiles and Trucks	23	2.963	3.000	0.793
Apparel	21	2.908	3.000	1.072
Utilities	133	2.998	3.000	1.010
High exclusion quality				
Fabricated Products and Machinery	53	2.943	3.013	0.938
Tobacco Products	16	2.801	3.043	0.772
Food Products	53	2.987	3.131	0.833
Consumer Goods	35	3.017	3.282	0.979
Business Supplies and Shipping Containers	22	3.394	3.344	0.835
Wholesale	29	3.416	3.565	0.762
Full Sample - includes obs. from industries not listed above	1,665	2.679	2.728	0.920
Average Std Dev. across industries				0.861
Difference in Std Dev. (Industry average – Full sample)				−0.059**

Table 4
Determinants of Non-GAAP Exclusion Quality

This panel presents the characteristics of our sample firms classified by exclusion quality. Our main sample includes 1,665 firm-year observations between 2013 and 2017. We develop a firm-year measure of non-GAAP exclusion quality, *Exclusion Quality Score*, based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development. In Panel A, we sort firm-year observations into five groups (i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*) based on the quintile ranks of exclusion quality scores by year. Firms with exclusion quality scores below the 20th percentile are labeled as firms with *Low* non-GAAP exclusion quality. Firms with exclusion quality scores between the 20th and 40th percentiles are labeled as firms with *Medium Low* non-GAAP exclusion quality. Firms with exclusion quality scores between the 40th and 60th percentiles are labeled as firms with *Neutral* non-GAAP exclusion quality. Firms with exclusion quality scores between the 60th and 80th percentiles are labeled as firms with *Medium High* non-GAAP exclusion quality. Firms with exclusion quality scores above the 80th percentile are labeled as firms with *High* non-GAAP exclusion quality. We report the mean values of each variable by exclusion quality. We also compare the difference between the *High* and *Low* exclusion quality group and report the *t*-statistics in italics. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively. All variables are defined in Appendix 1.

Panel A: Analysis of the determinants of non-GAAP exclusion quality by quality group.

	Low	Medium Low	Neutral	Medium High	High	Diff. High − Low	t-stat.
Non-GAAP Exclusions							
Exclusion Quality Score	1.445	2.073	2.744	3.200	4.000	2.555***	*97.86*
Number of Exclusions	5.286	6.078	5.114	5.088	3.686	-1.600***	*-8.38*
Total Exclusion/GAAP	2.059	1.905	0.627	1.132	0.687	-1.373***	*-7.70*
I(Non-GAAP > EBITDA)	0.426	0.438	0.160	0.067	0.027	-0.398***	*-13.92*
Fundamentals							
Sales Growth	0.069	0.073	0.035	0.016	0.024	-0.044***	*-3.60*
ROA	0.048	0.059	0.047	0.045	0.060	0.013***	*2.71*
I(Loss)	0.092	0.114	0.109	0.138	0.073	-0.020	*-0.93*
CFO	0.103	0.109	0.099	0.096	0.104	0.001	*0.19*
Market Pressure							
Prior Stock Return	0.051	0.062	0.025	0.008	0.019	-0.032	*-1.59*
Target Price Implied Ret	0.277	0.238	0.248	0.109	0.225	-0.052	*-0.91*
Stock Compensation	0.323	0.399	0.316	0.312	0.280	-0.043*	*-1.68*
Leverage	0.345	0.290	0.246	0.261	0.258	-0.087***	*-7.01*
Institutional Ownership	0.852	0.842	0.810	0.797	0.794	-0.058***	*-5.12*
Earnings to Price	0.029	0.034	0.022	0.021	0.037	0.008	*1.33*
Book to Market	0.389	0.401	0.479	0.501	0.396	0.007	*0.28*
Firm Size	9.851	9.873	10.211	10.116	10.081	0.231**	*2.53*
Firm Age	33.869	31.279	38.432	42.660	44.931	11.061***	*7.53*
Ln(Analysts)	2.564	2.612	2.779	2.717	2.835	0.272***	*4.27*
Financial Reporting Quality							
FScore	1.059	1.045	0.962	0.944	1.064	0.005	*0.26*
Abs(Accruals)	0.062	0.070	0.061	0.060	0.061	-0.002	*-0.37*
Disc Accruals	-0.058	-0.021	0.019	-0.020	-0.017	0.041	*0.92*

Table 4 (continued)

This panel presents OLS regressions of exclusion quality score on various firm characteristics for our sample firms with available data between 2013 and 2017. The dependent variable, *Exclusion Quality Score*, is a firm-year measure of non-GAAP exclusion quality based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development. Columns (1) and (2) reports regression results with no fixed effects, and Columns (3) and (4) with (Fama-French 30) industry and year fixed effects. Columns (2) and (4) present *t*-statistics in italics based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively. All variables are defined in Appendix 1.

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

	Pred. sign	*Dep Var = Exclusion Quality Score*			
		(1) Coefficient	(2) *t-stat.*	(3) Coefficient	(4) *t-stat.*
Intercept		3.210***	*8.89*	3.033***	*8.26*
Non-GAAP exclusions					
Total Exclusion/GAAP	−	-0.023**	*-2.55*	-0.019**	*-2.28*
I(Non-GAAP > EBITDA)	−	-0.793***	*-12.78*	-0.746***	*-12.28*
Fundamentals					
Sales Growth	−	-0.276**	*-2.19*	-0.413***	*-3.11*
ROA	+	-0.047	*-0.08*	-0.005	*-0.01*
CFO	?	0.315	*0.50*	0.626	*0.90*
Market Pressure					
Prior Stock Return	−	-0.175**	*-2.01*	-0.155*	*-1.77*
Target Price Implied Ret	−	-0.037	*-1.04*	-0.003	*-0.08*
Stock Compensation	−	-0.035	*-0.45*	0.006	*0.07*
Leverage	−	-0.546***	*-3.00*	-0.581***	*-2.95*
Institutional Ownership	−	-0.121	*-1.56*	-0.118	*-1.52*
Earnings to Price	+	-0.374	*-1.64*	-0.341	*-1.40*
Book to Market	?	-0.024	*-0.32*	-0.059	*-0.75*
Firm Size	+	-0.046	*-1.46*	-0.023	*-0.67*
Firm Age	+	0.006***	*3.37*	0.002	*1.28*
Ln(Analysts)	+	0.034	*1.02*	0.015	*0.40*
Financial Reporting Quality					
FScore	?	0.079	*1.24*	0.144	*1.08*
Abs(Accruals)	?	0.391	*1.03*	0.528	*1.36*
Disc Accruals	?	0.048	*0.86*	0.058	*1.22*
Industry fixed effects		No		Yes	
Year fixed effects		No		Yes	
Number of observations		1,329		1,329	
Adjusted R^2		22.6%		25.5%	

Table 5
Non-GAAP Exclusion Quality and Beating Expectations

This table presents logistic regressions of whether firms use non-GAAP exclusions to beat analyst expectations on non-GAAP exclusion quality for our sample firms with available data between 2013 and 2017. The dependent variable, *Discretionary Beat*, is an indicator variable that equals one if non-GAAP earnings are equal to or greater than analyst consensus forecasts while I/B/E/S actual earnings are lower than analyst consensus forecasts, and zero otherwise. The main variable of interest, *Exclusion Quality Score*, is a firm-year measure of non-GAAP exclusion quality based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development. Panel A uses *Exclusion Quality Score* based on firms' most aggressive non-GAAP metric. Panel B provides robustness results for firms reporting EBITDA as a non-GAAP metric by (1) excluding such firms from the regression and (2) redefining *Exclusion Quality Score* based on the firm's non-GAAP EPS. The regressions include (Fama-French 30) industry and year fixed effects. *z*-statistics and *t*-statistics are reported in italics based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively. All variables are defined in Appendix 1.

Panel A: Logit regressions for the full sample.

	Pred. sign	Dep Var = Discretionary Beat	
		(1) Coefficient	(2) z-stat.
Intercept		3.940**	*2.14*
Non-GAAP exclusions			
Exclusion Quality Score	−	**-0.206****	**-2.11**
Total Exclusion/GAAP		0.055**	*2.31*
Fundamentals			
Sales Growth		-0.630	*-1.27*
ROA		1.084	*0.42*
CFO		-3.466	*-1.45*
Market Pressure			
Prior Stock Return		-0.165	*-0.54*
Target Price Implied Ret		-0.224	*-1.49*
Stock Compensation		-0.116	*-0.45*
Leverage		1.182**	*2.10*
Institutional Ownership		-0.020	*-0.08*
Earnings to Price		0.870	*0.54*
Book to Market		0.199	*0.86*
Firm Size		-0.252**	*-2.46*
Firm Age		0.001	*0.17*
Ln(Analysts)		0.446***	*3.79*
Ln(Horizon)		-0.648**	*-2.51*
Financial reporting quality			
FScore		0.169	*0.80*
Abs(Accruals)		0.137	*0.09*
Disc Accruals		-0.244	*-1.24*
Industry fixed effects		Yes	
Year fixed effects		Yes	
Number of observations		1,320	
Adjusted R^2		8.5%	

Table 5 (continued)

Panel B: Robustness results regarding firms reporting both EBITDA and non-GAAP EPS.

	Pred. sign	*Dep Var = Discretionary Beat*			
		Excluding EBITDA reporting firms		*Defining exclusion score using non-GAAP EPS*	
		(1)	(2)	(3)	(4)
		Coefficient	*z-stat.*	Coefficient	*z-stat.*
Intercept		2.247	*1.04*	3.364*	*1.90*
Non-GAAP exclusions					
Exclusion Quality Score	−	-0.223**	*-2.05*	-0.195*	*-1.69*
Total Exclusion/GAAP		0.028	*0.80*	0.073***	*3.17*
Fundamentals					
Sales Growth		-0.989	*-1.48*	-0.545	*-1.11*
ROA		1.390	*0.44*	1.917	*0.79*
CFO		-3.457	*-1.17*	-2.823	*-1.21*
Market Pressure					
Prior Stock Return	+	-0.097	*-0.25*	-0.142	*-0.46*
Target Price Implied Ret	+	-0.300	*-1.57*	-0.174	*-1.18*
Stock Compensation	+	0.011	*0.04*	-0.227	*-0.90*
Leverage	+	1.395*	*1.93*	1.716***	*3.08*
Institutional Ownership	+	-0.059	*-0.2*	-0.016	*-0.06*
Earnings to Price	−	0.084	*0.04*	0.490	*0.35*
Book to Market	−	-0.240	*-0.66*	0.109	*0.45*
Firm Size	−	-0.217*	*-1.74*	-0.248**	*-2.52*
Firm Age	−	-0.001	*-0.10*	-0.001	*-0.03*
Ln(Analysts)	+	*0.518***	*3.20*	*0.393***	*3.52*
Ln(Horizon)	?	*-0.339*	*-1.10*	*-0.616**	*-2.48*
Financial reporting quality					
FScore		0.159	*0.62*	0.202	*0.95*
Abs(Accruals)		-0.279	*-0.17*	-0.383	*-0.25*
Disc Accruals		-0.264	*-1.22*	-0.236	*-1.25*
Industry fixed effects		Yes		Yes	
Year fixed effects		Yes		Yes	
Number of observations		1,101		1,320	
Adjusted R^2		9.3%		8.1%	

Table 6
Non-GAAP Exclusion Quality and Future SEC Scrutiny and Enforcement

This table presents logistic regressions of the likelihood of receiving SEC comment letters and citations for Regulation G violations on non-GAAP exclusion quality for our sample firms with available data between 2013 and 2017. For Columns (1) and (2), the dependent variable, *Comment Letter*, is an 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. For Columns (3) and (4), the dependent variable, *RegG Violation*, is an indicator variable that equals one if there is a subsequent citation for Regulation G violation against the firm's non-GAAP earnings reported in the current year, and zero otherwise. The main variable of interest, *Exclusion Quality Score*, is a firm-year measure of non-GAAP exclusion quality based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development. All regressions include (Fama-French 30) industry and year fixed effects. Columns (2) and (4) present *z*-statistics in italics based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively. All variables are defined in Appendix 1.

	Pred. sign	Dep Var = Comment Letter		Dep Var = RegG Violation	
		(1) Coefficient	(2) z-stat.	(3) Coefficient	(4) z-stat.
Intercept		-3.907	*-1.25*	-3.246	*-0.63*
Non-GAAP exclusions					
Exclusion Quality Score	−	**-0.227****	**-2.28**	**-0.396****	**-2.43**
Total Exclusion/GAAP		-0.007	*-0.29*	-0.019	*-0.48*
I(Non-GAAP > EBITDA)		-0.580**	*-2.15*	0.776**	*2.33*
Fundamentals					
Sales Growth		0.445	*1.07*	-0.445	*-0.71*
ROA		-4.704**	*-2.23*	-6.151***	*-2.93*
CFO		0.254	*0.11*	0.389	*0.56*
Market Pressure					
Prior Stock Return		-0.165	*-0.65*	0.897**	*2.08*
Target Price Implied Ret		0.018	*0.11*	0.071	*0.47*
Stock Compensation		-0.417	*-1.36*	-0.592	*-1.60*
Leverage		0.432	*0.61*	0.646	*0.73*
Institutional Ownership		0.303	*0.94*	-0.214	*-0.57*
Earnings to Price		0.993	*1.00*	2.817***	*2.89*
Book to Market		-0.131	*-0.39*	-0.147	*-0.27*
Firm Size		0.079	*0.63*	-0.092	*-0.55*
Firm Age		0.007	*0.96*	0.001	*0.03*
Ln(Analysts)		-0.080	*-0.58*	0.055	*0.29*
Financial reporting quality					
FScore		0.093	*0.37*	1.489***	*3.04*
Abs(Accruals)		0.086	*0.07*	-0.958	*-0.47*
Disc Accruals		0.234	*1.63*	-0.020	*-0.11*
Industry fixed effects		Yes		Yes	
Year fixed effects		Yes		Yes	
Number of observations		1,329		1,329	
Adjusted R^2		7.23%		11.45%	

Table 7
Non-GAAP Exclusion Quality and Analyst Forecast Dispersion

This table presents a logistic regression of analyst forecast dispersion on non-GAAP exclusion quality for our sample firms with available data between 2013 and 2017. The dependent variable, *Forecast Dispersion*, is the standard deviation of individual analyst forecasts for the current year earnings. We require that analyst forecasts are issued within 90 days prior to the earnings announcement. The main variable of interest, *Exclusion Quality Score*, is a firm-year measure of non-GAAP exclusion quality based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development. The regression includes (Fama-French 30) industry and year fixed effects. *z*-statistics and *t*-statistics are reported in italics based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively. All variables are defined in Appendix 1.

	Pred. sign	Dep Var = Forecast Dispersion	
		(1) Coefficient	(2) *t-stat.*
Intercept		0.477*	*1.78*
Non-GAAP exclusions			
Exclusion Quality Score	**−**	**-0.026****	***-2.28***
Total Exclusion/GAAP		-0.001	*-0.22*
Fundamentals			
Sales Growth		0.065	*0.52*
ROA		-0.375	*-0.75*
CFO		0.300	*0.82*
StdDev Sales Growth		-0.006	*-0.49*
StdDev ROA		0.863	*1.64*
StdDev CFO		0.132**	*2.39*
Market Pressure			
Prior Stock Return		0.124**	*2.35*
Target Price Implied Ret		-0.021	*-0.80*
Stock Compensation		-0.088**	*-2.37*
Leverage		0.218**	*2.23*
Institutional Ownership		0.047	*1.43*
Earnings to Price		-0.498**	*-2.08*
Book to Market		0.144**	*2.26*
Firm Size		0.009	*0.63*
Firm Age		-0.001	*-0.96*
Ln(Analysts)		-0.028*	*-1.81*
Ln(Horizon)		−0.116***	*-0.084***
Financial reporting quality			
FScore		0.001	*0.04*
Abs(Accruals)		-0.071	*-0.39*
Disc Accruals		0.102	*1.60*
Industry fixed effects		Yes	
Year fixed effects		Yes	
Number of observations		1,312	
Adjusted R^2		15.7%	

Table 8
Non-GAAP Exclusion Quality and Price Discovery Efficiency

This table presents OLS regressions of price discovery efficiency on non-GAAP exclusion quality for our sample firms with available data between 2013 and 2017. For Columns (1) and (2), the dependent variable, *IPE5*, is a measure of the speed of price discovery over the five trading days following the earnings announcement. For Columns (3) and (4), the dependent variable, *IPE10*, is a measure of the speed of price discovery over the ten trading days following the earnings announcement. The main variable of interest, *Exclusion Quality Score*, is a firm-year measure of non-GAAP exclusion quality based on the quality and magnitude of individual items excluded from non-GAAP earnings. Exhibit 2 provides detailed examples of the score development. All regressions include (Fama-French 30) industry and year fixed effects. Columns (2) and (4) present *t*-statistics in italics based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively. All variables are defined in Appendix 1.

	Pred. sign	*Dep Var = IPE5*		*Dep Var = IPE10*	
		(1) Coefficient	(2) *t-stat.*	(3) Coefficient	(4) *t-stat.*
Intercept		0.332**	*2.25*	0.354***	*2.61*
Non-GAAP exclusions					
Exclusion Quality Score	**+**	**0.022****	***2.45***	**0.018****	***2.18***
Total Exclusion/GAAP		-0.004***	*-2.70*	-0.004**	*-2.36*
I(Non−GAAP > EBITDA)		-0.022	*-1.44*	-0.025**	*-2.13*
Fundamentals					
Sales Growth		0.021	*0.27*	-0.066***	*-2.70*
ROA		0.105	*0.75*	0.135	*1.14*
CFO		0.149	0.89	0.045	0.35
UE		0.014	*0.20*	-0.012	*-0.53*
Abs(UE)		0.038**	*2.33*	0.008**	*2.33*
Price per share		0.001	*0.57*	0.00	*0.83*
Market Pressure					
Prior Stock Return		-0.042	*-1.15*	-0.002	*-0.12*
Target Price Implied Ret		0.025**	*2.55*	0.017**	*2.17*
Stock Compensation		-0.019	*-0.63*	0.018	*1.01*
Leverage		-0.116***	*-2.67*	-0.121***	*-2.94*
Institutional Ownership		0.002	*0.12*	0.008	*0.44*
Earnings to Price		*-0.027*	*-0.42*	*-0.022*	*-0.51*
Book to Market		*-0.060***	*-2.43*	*-0.054***	*-2.41*
Firm Size		0.001	*0.02*	0.004	*0.60*
Firm Age		0.001	*1.26*	0.00	*0.71*
Ln(Analysts)		0.018	*1.12*	0.030**	*2.02*
Financial reporting quality					
FScore		*0.031**	*1.82*	*0.021*	*1.38*
Abs(Accruals)		*-0.057*	*-0.52*	*0.024*	*0.29*
Disc Accruals		*-0.001*	*-0.11*	-0.007	*-0.95*
Ln(Report Lag)		*-0.063*	*-0.96*	0.008	*0.33*
Guidance		-0.014	*-0.88*	-0.007	*-0.49*
Industry fixed effects		Yes		Yes	
Year fixed effects		Yes		Yes	
Number of observations		1,034		1,034	
Adjusted R^2		4.92%		5.80%	

Appendix 1
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 net income minus non-GAAP earnings scaled by absolute GAAP net income, 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 is higher than EBITDA, and zero otherwise.	Audit Analytics and Compustat
Fundamentals		
Sales Growth	Percentage growth in sales of the current year, winsorized at the 1st and 99th percentiles by year.	Compustat
ROA	Profitability of the current year measured as income before extraordinary items divided by average total assets, winsorized at the 1st and 99th percentiles by year.	Compustat
I(Loss)	Indicator variable that equals one if the firm reports a GAAP loss, and zero otherwise.	Compustat
CFO	Cash flow from operations divided by total assets, winsorized at the 1st and 99th percentiles by year.	Compustat
StdDev Sales Growth	Standard deviation of quarterly percentage growth in sales over the last five years, winsorized at the 1st and 99th percentiles by year.	Compustat
StdDev ROA	Standard deviation of return on assets over the last five years, winsorized at the 1st and 99th percentiles by year. 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, winsorized at the 1st and 99th percentiles by year.	Compustat
UE	Actual I/B/E/S EPS minus the most recent consensus EPS forecast scaled by price per share, winsorized at the 1st and 99th percentiles by year.	I/B/E/S and CRSP

Variables	Definition	Source
Fundamentals		
Abs(UE)	Absolute value of actual I/B/E/S EPS minus the most recent consensus EPS forecast scaled by price per share, winsorized at the 1st and 99th percentiles by year.	I/B/E/S and CRSP
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 period.	CRSP
Target Price 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, winsorized at the 1st and 99th percentiles by year.	I/B/E/S and CRSP
Stock Compensation	Percentage of shares held by the CEO out of the total shares outstanding, winsorized at the 1st and 99th percentiles by year.	ExecuComp
Leverage	Total liabilities divided by total assets, winsorized at the 1st and 99th percentiles by year.	Compustat
Institutional Ownership	Percentage of shares held by institutional investors out of the total shares outstanding, winsorized at the 1st and 99th percentiles by year.	Thomson Reuters
Earnings to Price	Income before extraordinary items divided by market value of equity, winsorized at the 1st and 99th percentiles by year.	Compustat
Book to Market	Book value of equity divided by market value of equity, winsorized at the 1st and 99th percentiles by year.	Compustat
Firm Size	Natural logarithm of total assets.	Compustat
Firm Age	Number of years since the first year of appearance on Compustat.	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

Variables	Definition	Source
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 expenses scaled by average total assets, winsorized at the 1st and 99th percentiles by year.	Compustat
Disc Accruals	Peer-adjusted discretionary accruals winsorized at the 1st and 99th percentiles by year. 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
Dependent Variables		
Discretionary Beat	Indicator variable that equals one if non-GAAP earnings are equal to or greater than analyst consensus forecasts, while I/B/E/S actual earnings are lower than analyst consensus forecasts, and zero otherwise.	Audit Analytics and I/B/E/S
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	Standard deviation of individual analyst forecasts for the current year earnings, winsorized at the 1st and 99th percentiles by year. We require that analyst forecasts are issued within 90 days prior to the earnings announcement.	I/B/E/S
IPE5	Speed of price discovery over the five trading days after the earnings announcement following Blankespoor, deHaan, and Marinovic (2020), winsorized at the 1st and 99th percentiles by year.	CRSP and I/B/E/S
IPE10	Speed of price discovery over the ten trading days after the earnings announcement following Blankespoor, deHaan, and Marinovic (2020), winsorized at the 1st and 99th percentiles by year.	CRSP and I/B/E/S

Appendix 2
Evaluating Individual Non-GAAP Exclusions

This appendix discusses the economic nature, accounting measurement, and valuation implications of individual non-GAAP exclusions and categorizes the exclusions into five quality groups, i.e., *Low*, *Medium Low*, *Neutral*, *Medium High*, and *High*. For each exclusion, we consider the following and reference relevant empirical evidence:

Economic nature: 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?

Measurement: Is the excluded item likely to recur in future years? Does the accounting measurement rule induce transitory components in GAAP earnings? Do we have evidence on serial correlation for the item?

Valuation: Is the excluded item relevant for forecasting future earnings or cash flows? Is there empirical evidence that suggests manipulation of the exclusion to meet earnings targets or evidence of investor mis-valuation?

Low Quality Exclusions
(Exclusion quality score: 1)

1.   Depreciation and amortization

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

1.2.   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.

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

1.4.   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. However, Moeehrle, Reynolds-Moehrle, and Wallace (2001) finds that the exclusion of goodwill amortization does not change the informativeness of the earnings number, as measured by the R^2 from regressions of annual market-adjusted returns on earnings that includes or excludes goodwill amortization. This finding suggests that goodwill amortization is value-irrelevant, and supports FASB's decision to do away with goodwill amortization. However, that paper was written over 20 years ago, and it is not clear that it is the appropriate research design for justifying exclusions of amortization of intangible assets.

1.5.   Summary
The AR1 coefficient for depreciation and amortization is 0.711, 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.

2. Net interest expenses

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.

2.2. Measurement
As with depreciation, it is highly likely to recur in the future.

2.3. Valuation
Interest relates to a financing activity, not an operating activity, therefore it is not relevant for forecasting future revenue generation. However, 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.

2.4. Summary
The AR1 coefficient for interest expenses is 0.887, consistent with the highly recurring nature of this item. Overall, we consider this item a low-quality exclusion because of it is part of ongoing operations.

3. Rent and lease expense/adjustments

3.1. Economic nature and valuation
Rent and lease expenses are part of core business operations and is relevant for valuation given its implications for future cash flows.

3.2. Measurement
Lease expenses that managers exclude typically reflect lease amortization. This item sometimes includes one-off expenses related to lease termination. These items may not equal the cash outlays directly paid for the lease but if this is the case, then the cash paid should be included in the non-GAAP measure.

3.3. Summary
The AR1 coefficient for lease expenses is 0.658, consistent with the recurring nature of this item. Overall, we consider this item a low-quality exclusion because it is part of ongoing operations.

4. R&D expense

4.1. Economic nature
Firms spend money on R&D to generate future revenue. Therefore, the item is highly likely to recur in the future.

4.2. Measurement
R&D is expensed. Ideally, cash outlays for R&D would be capitalized as an asset and amortized over some time period.

4.3. Valuation
Even though R&D should 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 its future benefit, justifying inclusion in reported income. Therefore, overall, there is some ambiguity around whether exclusion of R&D expenses is justifiable based on its asset like characteristics.

4.4. Empirical Evidence
Lev and Sougiannis (1996) find that R&D expense are value-relevant to investors and document an association between R&D and future stock returns. Whereas Kothari, Laguerre and Leone (2002) find that R&D expense is associated with a higher standard deviation of 5-year ahead earnings, consistent with the uncertainty of benefits derived from R&D expense. Furthermore, Curtis, McVay and Toynbee

(2020) document a decline in the association between current R&D expense and future profits over time, suggesting that R&D expense may not be as predictive of future firm performance as it used to be.

4.5. Summary

R&D has high serial correlation, with an AR1 coefficient of 0.811. We view R&D exclusions a low-quality exclusion.

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Medium Low Quality Exclusions
(Exclusion quality score: 2)

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5. Pension-related expense/adjustments

5.1. Economic nature

Pension expenses are part of core business payments to employees.

5.2. Measurement

The focus of the accounting rules for pension is on valuing the pension asset and the pension liability and recognizing the difference over time. This difference does not reflect actual cash flows but represents a change in the forecast of future pension obligations. Excluded pension costs can relate to settlement costs. These costs remove the obligation to the employee(s) off the books. Therefore, settlement costs can include a lot of transitory catch-up accruals made to clean up the books. Thus, the accounting measurement rules can induce transitory components into earnings.

5.3. Valuation

Recurring pension expenses are value-relevant since they are part of core business expenses. However, non-recurring pension-related items such as corridor adjustments or settlement costs introduces some ambiguity in its value-relevance relative to other components of income.

5.4. Summary

This item has a high AR1 coefficient (0.834). 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.

6. Stock compensation expense

6.1. Economic nature

Stock compensation are payments 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. They also save young, growing firms cash, which can be useful in start-ups.

6.2. 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 in cash to buy the stock (in the case of options) or may be given a real stock or a stock equivalent payout.

Growing firms often use stock compensation to avoid having to pay real cash to employees. The goal of such compensation plans is to incentivize the employee to work harder to boost stock prices (share the risks and rewards of ownership). The justification for exclusion is that no cash leaves the firm, the employees are giving sweat labor in return for becoming owners. Under this logic, stock compensation could be seen as an asset while the employee earns them and could remain on the book as an asset once the employee earns them, and then being expensed when the employee sells the shares or leaves the firm. However, excluding stock compensation completely does not recognize the dilution effect that will occur in the future. Thus, if the cost is indicative of the dilution effect, then it should be considered in valuation. If it is not, then investors could end up overvaluing a firm that issues a lot of stock.

6.3. Valuation and Empirical Evidence

Mohanram, White and Zhao (2020) provide evidence supporting overvaluation of firms with higher stock-based compensation. Results from their study indicate that failure to account for stock-based compensation as an expense leads to the overvaluation of a firm's equity.

Barth, Gow, and Taylor (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 exclude stock-based compensation for opportunistic reasons.

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 for opportunistic reasons.

Given that findings from prior literature support the idea that exclusions of stock-based compensation results in overvaluation, and stock-based compensation may be excluded for opportunistic reasons, we view stock compensation-expense as a medium-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.

6.4. Summary

The AR1 coefficient is 0.763, consistent with stock-based compensation being a persistent expense. Overall, because of the ambiguities discussed above, we rate this expense as a medium-low-quality exclusion.

7. Inventory write-downs

7.1. 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.

7.2. 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 their sale). From an income statement perspective, managers should have to match the inventory costs to the lower revenues generated and show lower profit margins. More 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 on the balance sheet as "Bad decision inventory" that are removed once they are sold or discarded.

7.3. Summary

These charges have relatively low persistence (the AR1 coefficient is 0.144). We categorize inventory write-downs as a medium-low-quality exclusion.

8. Realized gains/losses on investment securities

8.1. Measurement

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

8.2. Summary
The AR1 coefficient is 0.149, consistent with this item being non-persistent. We classify this item as a medium-low-quality exclusion.

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Neutral Quality Exclusions
(Exclusion quality score: 3)

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9. Tax impact of exclusions

9.1. Measurement
This item relates to the tax impact of various qualities of exclusion items. It is less likely to be opportunistic since in most cases this is an income-decreasing exclusion that adversely affects non-GAAP earnings. It is not a standalone expense and is usually reported to reconcile another item to after-tax net income.

9.2. Summary
We classify tax impact of exclusions as a neutral-quality exclusion so that it has a minimal impact on a firm's overall exclusion quality score.

10. Deferred revenue

10.1. Economic nature
Deferred revenue is included in earnings in a period later than when the cash is received from the customer. Therefore, firms sometimes exclude deferred revenue from non-GAAP earnings because they have a non-GAAP metric that focused on recording revenue at the time that cash was received.

10.2. Summary
We find that deferred revenue has low persistence with an AR1 coefficient of 0.042. We view deferred revenue as a neutral-quality exclusion.

11. Foreign currency gains/losses

11.1. Economic nature
These gains and losses have to do with assets or liabilities being in foreign countries and subject to exchange rate fluctuations, which managers have no control over.

11.2. Measurement
Accounting rules for foreign currency gains and losses are the result of a focus on the balance sheet, resulting in fluctuations in market value being reflected in earnings. If there is no intention to discontinue foreign operations, these gains and losses are irrelevant since the business is not being sold and therefore these gains and losses are unlikely to be realized.

11.3. Valuation
Campbell (2015) finds that unrealized gains and losses on cash flow hedges, including foreign currency exchange rates, are negatively associated with future firm profitability and stock returns. This finding suggests that they could be relevant information to investors in certain circumstances.

11.4. Summary
We find that the AR1 coefficient is only 0.064, which reflects the non-persistent 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. It is also typically non-persistent and has low variance in nature. However, we recognize that this may not hold for all firms. We therefore classify foreign currency gains and losses as a neutral-quality exclusion.

12. Impairment on PP&E and intangible assets

12.1. Economic Nature
Some businesses do not do as well as managers hope for. With the benefit of hindsight (or maybe even before hand) it becomes clear that the company is not generating enough revenue to cover the cost of the PP&E or intangible assets.

12.2. 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 so as to correct the balance sheet amounts. The accounting is inconsistent and conservative. Managers cannot offset impairments against assets that have had gains (risen in value). Impairment charges are negative and induce transitory components into income. They are non-cash.

Managers are responsible for asset impairments since impairments signal that they did not depreciate previously purchased assets fast enough. In other words, impairments are related to managers' prior misestimations of assets' useful lives. A better matching approach would be to record a larger depreciation cost for the remaining life of the asset and disclose the decline in value in the notes. This would allow investors to perceive the lower return on assets and keep management accountable for the cost. 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 that 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. A more appropriate accounting treatment would be to amortize the goodwill cost over time so as to avoid goodwill impairments that are excluded and ignored.

12.3. Empirical evidence
Riedl (2004) finds that write-offs of long-lived assets have decreased in quality.

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) show 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 3 – 4 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. Therefore, given the delays in recording impairments documented by prior research, empirical findings seem to suggest that allocation of goodwill expense over time would be more appropriate.

12.4. Summary
Impairments have low serial correlation (AR1 coefficient of 0.144). Given the low serial correlation and the ambiguity in goodwill impairment, we view this item as a neutral-quality exclusion.

13. Equity income from unconsolidated subsidiaries

13.1. Measurement
This item is often a gain from firms' unconsolidated investees, and therefore is less likely to be an opportunistic exclusion.

13.2. Summary
This item is highly persistent with an AR1 coefficient of 0.679. We view equity income from unconsolidated subsidiaries as a neutral-quality exclusion.

14.   Gains/losses on sale of PP&E

14.1. Measurement
On the one hand, gains and losses on PP&E arise because depreciation was measured with error. On the other hand, gains and losses on PP&E are dependent on property prices at the time of sale, which is unpredictable. Ideally, the gain or loss should be amortized either backward or forward.

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

14.3. Summary
The AR1 coefficient is low (0.123), consistent with gains or losses being transitory. Overall, we view gains and losses on PP&E as a neutral-quality exclusion.

15.   Unrealized fair value adjustments from trading securities

15.1. Measurement
Whether the firm reports an unrealized gain or loss is dependent on market conditions, making this item highly variable in nature. Their inclusion in earnings is based on a balance sheet perspective (revaluing marketable securities to market), but they introduce noise into earnings since they are unrealized. Therefore, it can be reasonable for management to provide a measure of core earnings that excludes them.

15.2. Valuation
They are unlikely to be useful for forecasting future performance. These adjustments are dependent on prevailing market conditions and are not reflective of future market conditions. They are more relevant in asset management, where the business is trading securities, and these are considered operating assets. They could be less relevant in business that are trading because they have extra cash.

15.3. Summary
The AR1 coefficient is 0.138, consistent with this item being non-persistent. We classify this item as a neutral-quality exclusion since it is highly variable and has little implication for valuation.

> ### *Medium High Quality Exclusions*
> ### (Exclusion quality score: 4)

16.   Executive severance or termination costs

16.1. Measurement
This item relates to pay outs to executives when there is an acquisition, or a division is closed down. They are less likely to recur but they will typically involve cash and so need to be accounted for, either amortized over some time period, or expensed depending on the circumstances.

16.2. Valuation
They are relevant for forecasting future cash flows only for firms that do recurring acquisitions. For such firms, they are a real cash outflow.

16.3. Summary
We view executive severance or termination costs as a medium-high-quality exclusion.

17.   Merger and acquisition costs

17.1. Economic nature
Merger and acquisition costs arise from integrating a new business into the firm's core business and should be recognized as part of core operations.

17.2. 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 have to pay to buy the business. When firms continually engage in acquisitions, the "one-off" argument for exclusion is not appropriate.

17.3. Summary

We find that acquisition cost has an AR1 coefficient of 0.269. We classify this item as a medium-high-quality exclusion due to the ambiguity of not being able to capitalize and amortize these costs.

18. Debt extinguishment/Refinancing costs

18.1. Economic nature

These costs are likely to vary depending on the type and terms of financing employed 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.

18.2. Measurement

Whether these are recuring or non-recurring is likely to depend on the business and debt strategy of the firm but are generally less likely to recur.

18.3. Summary

The AR1 coefficient of 0.231 suggests that this is not a highly recurring item. We classify debt extinguishment and refinancing costs as a medium-high-quality exclusion.

19. New initiatives and start-up costs

19.1. Measurement

From an income statement perspective, these are costs incurred to obtain a future benefit (e.g., going public) and should be capitalized and amortized over some time 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.

19.2. Summary

We view new initiatives and start-up costs as a medium-high-quality exclusion.

20. Restructuring charges

20.1. Economic nature

Firms can incur restructuring charges when they discontinue certain lines of business. These differ from discontinued operations because the firm is not discontinuing an entire operation, but only parts of it. These charges often include severance packages and write-downs of assets, among others.

20.2. Measurement

The accounting for restructuring charges has changed over time. Initially, firms could classify various costs into restructuring charges (including ongoing costs). Now, the rules are more stringent with ASC420 laying out specific guidelines for costs associated with the item. However, there are still some restructuring charges can occur in more than one year (e.g., costs related to the discontinued line of business that continue to be incurred due to contractual obligations). Therefore, from a measurement perspective these are neither likely to be completely transitory or completely permanent.

20.3. Empirical evidence

Dechow, Huson and Sloan (1992) find that restructuring charges are not given weight when considering earnings for executive compensation. However, restructuring charges are given some weight when restructurings are recurring. In a similar vein, Cready, Lopez and Sisneros (2010) find that restructuring charges are the most common type of special item 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.

20.4. Summary

Restructuring charges are not completely transitory and may be used by managers to manage earnings. However, they are not expected to persist in the longer term. We find that restructuring charges have an AR1 coefficient of 0.116, which is relatively low. We categorize restructuring charges as a medium-high-quality exclusion.

High Quality Exclusions
(Exclusion quality score: 5)

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21. Tax and accounting rule changes – unusual/one time

21.1. Economic nature

Regulatory-related adjustments such as accounting adjustments from FASB standard changes or adjustments resulting from the tax act are not associated with core operations or business.

21.2. Measurement

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

21.3. Summary

We view unusual and one-time tax charges or other accounting rule change-related charges as a high-quality exclusion.

22. Discontinued operations

22.1. Economic nature

Once managers decide to discontinue an operation (segment) of the business, all income or losses from the business are aggregated together in discontinued operations. Since the business will not be continued it makes sense to clearly report this and exclude it from continuing operations.

22.2. Measurement

These are also not expected to recur since they do not relate to ongoing business.

22.3. Empirical evidence

Barua, Lin, and Sbaragalia (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. However, in contrast to Barua et al.'s (2010) findings, Curtis, McVay and Wolfe (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.

22.4. Summary
The AR1 coefficient on discontinued operations is 0.084, consistent with the idea that discontinued operations is not likely to persist into the future. We view discontinued operations as a high-quality exclusion since it is not reflective of core business performance.

23. Litigation/settlement costs

23.1. Measurement
Accounting rules require companies to wait until the amount of the obligation can be determined before recognizing litigation as a liability. Thus, there is a delayed recognition of losses from litigation. These amounts are also likely to be transitory.

23.2. Valuation
Investors are likely to be aware of impending lawsuits and this information is likely to be already impounded into stock price. Therefore, their exclusion from non-GAAP earnings should have limited impact on valuation.

23.3. Summary
Consistent with the non-recurring nature of such expenses, the AR1 coefficient is 0.146. We view litigation and settlement costs as a high-quality exclusion since it is most likely to be transitory and non-recurring.

24. Income attributable to non-controlling interests

24.1. Economic nature
Income attributable to non-controlling interests can arise from a variety of sources, such as joint ventures.

24.2. Measurement
Although this item is recurring, it represents income that are not available to the parent firm and its shareholders and is only recognized due to requirements to consolidate subsidiaries in full.

24.3. Summary
Given that this item is less relevant for common shareholders, we classify income attributable to non-controlling interests as a high-quality exclusion.

Table A1: Classification of Individual Exclusions Based on Management's Argument

This table provides a summary of managers' justification for each individual exclusion. When compared against our exclusion quality score in Exhibit 1, this table indicates that our exclusion quality rating system penalizes non-cash exclusions and calculations of free cash flows. Our consideration is that these are the least appropriate reason for excluding an item from non-GAAP earnings. Further down the table, the shading changes from red to green, indicating that we view exclusions that induce transitory components in earnings as reasonable exclusions because they do not relate to the core business, which is the most "legitimate" reason for excluding an item from non-GAAP earnings.

Item excluded because it is "non-cash"

(1) Depreciation and amortization	(2) Rent and lease expense/adjustments
(6) Stock compensation expenses	(11) Inventory write-downs
(9) Impairment on PP&E and intangible assets	(10) Gains/losses on sale of PP&E
(19) Deferred revenue	

Item excluded to calculate free cash flows

(1) Depreciation and amortization	(2) Net interest expenses
(8) Tax Impact of exclusions	

Item excluded because it relates to financing activities

(2) Net interest expenses	(8) Tax Impact of exclusions
(16) Debt extinguishment/Refinancing costs	

Item excluded because it has future benefits

(5) R&D expenses	(6) Stock compensation expenses
(13) Merger/acquisition costs	(17) New Initiatives and start-up costs

Item excluded because it induces transitory components in earnings

(4) Pension-related expense/adjustments	(9) Impairment on PP&E and intangible assets
(10) Gains/losses on sale of PP&E	(11) Inventory write-downs
(14) Unrealized fair value adjustments from trading securities	(15) Realized gains/losses on investment securities
(23) Foreign currency gains/losses	

Item excluded because it does not relate to the core business

(7) Executive severance or termination costs	(8) Tax Impact of exclusions
(12) Equity income from unconsolidated subsidiaries	(20) Tax and accounting rule changes - unusual/one time
(18) Restructuring charges	(22) Litigation/settlement costs
(21) Discontinued operations	
(24) Income attributable to non-controlling interests	