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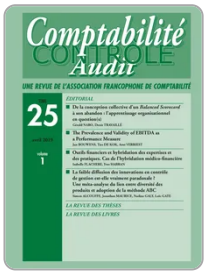

Article de revue

The Prevalence and Validity of EBITDA as a Performance Measure

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Notes

[1] Operating cash flow is the net cash flow generated by the operations, which is shown on the cash flow statement. Typically, operating cash flow is assessed by adding depreciation, amortization and other noncash

operating expenses (such as provisions for restructuring) and subtracting any increases in net working capital. Free cash flow is cash flow from operations less net investments in noncurrent operating assets. This number is equal to net dividends to shareholders plus the net payments to debt holders and debt issuers (Penman 2013).

2002; Sherman and Young 2016). In our study we examine how the characteristics of EBITDA may lead stakeholders and regulators to oppose against the use of EBITDA. Some practitioners have argued that while EBITDA is presented as a profit number, its very use suggests that capital is free and freely renewable (Buffet 2002). Other experts have questioned EBITDA as a cash flow measure (Sherman and Young 2016). In this paper we take issue with these criticisms.

Our study serves four purposes. First, we shed light on the features of EBITDA as a measure of profitability and we evaluate its validity as an earnings and cash flow indicator. Second, we document how prevalent the use of EBITDA is in financial reporting. Third, we investigate which firms are more likely to disclose and emphasize EBITDA. Fourth, we compare determinants of EBITDA disclosure with alternative and related concepts including adjusted EBITDA, EBITA and EBIT. To serve these purposes, we employ a sample containing all available annual reports (10-K's) and earnings announcements from firms belonging to the S&P 1500 index for the period 2005 to 2016.

The conclusions of this study can be summarized as follows. Our validity analysis suggests it is not unequivocally clear that EBITDA provides additional information on a firm's financial position, be it its profitability, cash-generating ability, liquidity risk or credit risk. Many value-relevant items are left out of the EBITDA calculation, rendering it less reflective of a firm's economic performance. In addition, when comparing EBITDA with alternative measures of earnings and cash flow, we find that EBITDA is usually the highest number. Therefore, EBITDA seems a suitable metric to disclose when management wants to show a better picture of firm performance. In this sense, our analysis supports the concerns levied by regulators and standard setters.

Descriptive evidence shows that in 24.8% of annual reports and 17.8% of press releases with earnings announcements EBITDA is mentioned at least once. We find that 14.8% of annual reports and 16.5% of earnings releases contains three or more EBITDA references. We find that the use of EBITDA in annual reports increases over time from 6.6% in 2005 to 23.5% in

reporting firms are significantly smaller and show larger analyst forecast errors than firms which never mention EBITDA in their financial disclosures. Consistent with the notion that managers may use EBITDA as a means to window-dress performance, we find that more capital-intensive firms and higher leveraged firms are more likely to provide EBITDA disclosures. As EBITDA does not take into account investment expenses and interest expenses, capital-intensive and highly indebted firms have EBITDA numbers that are considerably higher than net or operating income. In line with this result, we also find that EBITDA-disclosing companies are more likely to have missed the analyst forecast benchmark of earnings than non EBITDA-reporting ones. Next, less profitable firms are more likely to emphasize EBITDA in their earnings announcements. Consistent with the prediction that managers talk about EBITDA to avert the attention from lower operating cash flows, we find that firms with larger increases in working capital and longer operating cycles are more likely to focus on EBITDA.

We supplement these findings with three sets of important additional tests. A first relevant extension of our empirical analyses is that we document the relation between firm characteristics and EBITDA disclosures in a changes specification. Specifically, we show that firms start (stop) disclosing EBITDA when becoming smaller (bigger), less (more) profitability, more (less) levered and more (less) capital intensive. In a second set of additional tests, we investigate the intensity of EBITDA disclosures by counting the number of times it is mentioned. Results show that, even when only considering firms that mention EBITDA at least once, it is the smaller, more leveraged and more capital intensive firms that emphasize EBITDA more strongly. The third set of additional analyses considers the determinants of disclosures related to EBITDA. We find strong evidence that adjusted EBITDA measures, labelled “Adjusted EBITDA” and EBITDAR, are much more likely to be disclosed in annual reports and earnings announcements by smaller and less profitable firms as well as by firms with more tangible and intangible assets and more debt on their balance sheets. These results hold when only considering EBITDA reporting firms, serving as an indication for the opportunistic nature of adjusted EBITDA disclosures. Finally, we

This paper contributes to the literature in three relevant ways. First, and foremost, our study adds to the broad and growing literature on non-GAAP disclosures, as well as to the studies within the non-GAAP literature that focus on EBITDA. Although it serves as one of the most prominent non-GAAP disclosures, in fact, very few studies have explicitly focused on EBITDA. D'Souza, Ramesh and Chen (2010) and Rozenbaum (2018) are the notable exceptions. In contrast to these two studies, we are to the best of our knowledge the first to explicitly and extensively focus on the properties of EBITDA. As such, our study enhances our understanding of the concept of EBITDA as a non-GAAP financial disclosure. Moreover, we describe empirically how EBITDA compares with other performance measures and show detailed descriptive evidence on the prevalence and persistence of EBITDA disclosures for a large sample of firms. While D'Souza, Ramesh and Chen (2010) mainly emphasize the potential benefits of EBITDA as a measure allowing for more comparability across companies, we highlight the potential negative implications of employing EBITDA. Specifically, we put its validity as an earnings or cash flow measure to the test. As such, we also provide relevant input for the debate on the legitimacy of EBITDA and for the increasing concerns regulators have regarding non-GAAP measures, complementing the assertions of D'Souza, Ramesh and Chen (2010).

In a related study, Rozenbaum (2018) finds that EBITDA use potentially comes at a cost. EBITDA- disclosing firms over-invest in capital and documents systematic costs involved in using EBITDA in executive compensation contracts. Next to providing a descriptive discussion of EBITDA, our study extends Rozenbaum (2018) in three manners. First, as we report that smaller, less reputed, higher levered and more capital-intensive firms and firms with longer operating cycles are more likely to emphasize EBITDA in their disclosures, we do find indications of opportunistic motives explaining EBITDA disclosures. Rozenbaum (2018), in contrast, finds little evidence of EBITDA being disclosed opportunistically. Second, next to the probability of EBITDA being mentioned in financial reports, we also consider the intensity of EBITDA disclosures. Third, unlike Rozenbaum (2018), we also test which firm characteristics determine the probability of adjusted EBITDA disclosures, and EBIT and

allow considering country differences, but does provide us with a much larger and homogenous dataset. Second, we only focus on one specific non-GAAP disclosure item, which makes our study narrower but allows for a more detailed analysis of EBITDA-related disclosures. Finally, we contribute to Guillamon-Saorin, Isidro and Marques (2017) who document that managers attempt to distort investors' perceptions of performance when non-GAAP disclosures are of a lower quality. As these researchers do not explicitly focus on EBITDA, our findings of more opportunistic behavior in case of adjusted EBITDA figures and less of such behavior for EBIT and EBITA disclosures, are very much consistent with their conclusions and extend their empirical findings.

Second, our study complements the findings of the studies by Liu, Nissim and Thomas (2002; 2007). These researchers investigate the valuation properties of a set of different value drivers, including earnings, cash flow and EBITDA. They find that forward earnings, followed by historical earnings outperform EBITDA and cash flow as measures of intrinsic firm value. In a recent paper, Nissim (2017) compares the ability of EBITA to explain market valuations with the ability of EBIT and EBITDA to do so, motivated by the increasing magnitude of amortization charges in the last decades. He finds that, although EBITDA outperforms EBIT and EBITA in most cases, the difference between EBITDA and EBITA has decreased over the last three decades. Also, and most importantly, he concludes that each of these three measures of operating performance have failed to predict stock returns over the last seven years in a consistent manner. Our results corroborate both of these studies in a number of ways. First, we provide an explanation for *why* EBITDA is found by Liu, Nissim and Thomas (2002) to be an inferior performance metric compared to net income. Second, information on which type of firms are emphasizing EBITDA in their disclosures may provide an indication in which cases EBITDA is a better or worse measure of intrinsic value. Another related study is Li (2016) who shows that EBITDA is less useful than net income in explaining credit risk. Yet, covenants in debt contracts often require firms to report EBITDA numbers. For instance, Demerjian and Owens (2016) show in their sample 76% of their sample define interest coverage as EBITDA/Interest expense. Our study corroborates Li

literature is that larger and more reputed firms provide more voluntary disclosures. Our study is unique in the sense that it considers a voluntary piece of disclosure, EBITDA, but one that does not necessarily provide *better* information to investors. Our findings are consistent with those documented in this literature. On the one hand, we find that EBITDA provides a distorted picture of a firm's true performance. On the other hand, we document that firms that do not disclose EBITDA are significantly larger, more profitable and have a better credit quality. These firms presumably refrain from disclosing EBITDA because it does not incrementally inform investors on the firm's fundamental value.

The remainder of the paper is organized as follows. Section 2 provides an overview of the non-GAAP literature and motivates our study. Section 3 evaluates EBITDA as a performance measure and compares it with alternative measures. Section 4 outlines our hypotheses. Section 5 describes the sample and provides descriptive statistics on the prevalence of EBITDA disclosures. Section 6 provides regression analyses. Section 7 concludes.

2 – Literature and Motivation

The literature on non-GAAP disclosures is large and still expanding. A recent study of Black, Christensen, Ciesielski and Whipple (2018) provides a coherent review of the academic literature and gives insights on what we have learned on non-GAAP disclosures after two decades of work. One stream of studies in this area documents that non-GAAP earnings disclosed by the management provide incremental information about future firm performance and firm value relative to GAAP earnings (e.g., Bhattacharya, Black, Christensen and Larson, 2003). These findings are mainly concentrated in areas where the underlying GAAP earnings are less informative (Lougee and Marquardt, 2004). For instance, a recent study by Leung and Veenman (2018) shows that non-GAAP earnings disclosures of loss firms provide incremental information to investors.

Another stream of studies finds that at least some managers disclose non-GAAP earnings in an opportunistic fashion. Kolev, Marquadt and McVay (2008) report that many non-GAAP

Black and Christensen (2009) and Isidro and Marques (2015). The study of Isidro and Marques (2015) examines the effect of institutional and economic country factors on non-GAAP disclosures provided by managers. They document that managers are more likely to use non-GAAP measures to meet or beat earnings benchmarks that GAAP earnings would miss. They find stronger evidence in countries with larger equity markets, stronger legal efficiency and better investor protection. In a related paper, Guillamon-Saorin, Isidro and Marques (2017) investigate the market's reaction to the disclosure of non-GAAP earnings measures that are combined with high impression management. They document that, although non-GAAP measures can be informative to investors, the non-GAAP adjustments are more persistent when they go along with more impression management. The authors conclude from these findings that managers do behave opportunistically when disclosing non-GAAP earnings and attempt to distort investors' perceptions of firm performance.

In addition, we often find the relevant financial press debating the usefulness of non-GAAP measures up to the point where it raises the question whether these measures are disclosed to window-dress firm performance, including the performance of loss firms (e.g., Lahart, 2016). As of recently, non-GAAP earnings measures have received critique from regulators as well. In 2016 both the SEC (WSJ, March, 2016) and the IASB (WSJ, July, 2016) have raised objections against firms presenting non-GAAP earnings, including EBITDA, in their financial statements. The tolerance of the IASB and SEC of firms reporting EBITDA and EBITDA-like numbers seems to have decreased. Following up on his speech "Performance reporting and the pitfalls of non-GAAP metrics" held at Annual Conference of the European Accounting Association (Hoogervorst, 2016), Hans Hoogervorst chairman of the IASB rejected in July 2016 the very use of EBITDA in financial statements (WSJ, July, 2016): "however, not all non-standard accounting terms deserve to be rigorously defined." EBITDA is an inherently misleading measure that Mr. Hoogervorst said he would not want to define. "Depreciation and amortization are very real costs and I don't think they should be left out of the analysis," he added. The comments of the SEC convey the same sentiment. In March 2016 the SEC asserted that it considered regulation to prevent firms from presenting non-GAAP

has not been subject to an explicit and detailed investigation, even though it is widely considered in practice. EBITDA is frequently used as a performance measure in the business press, is increasingly used in executive compensation contracts (Smith and Stradley 2010) and used in debt covenants in lending agreements (Chava and Roberts 2008). Proponents of EBITDA often present it as a measure that provides for a quick and convenient means to assess a firm's ability to pay back interest and debts, or a measure that reflects the "cash generating ability" of a firm. Some financial analysis text books qualify debt-to-EBITDA as a solvency ratio arguing that it captures the ability to fulfill future debt obligations. [2] The alleged value of EBITDA may lie in that it provides for a generalizable (one-size fits all) accounting number that summarizes (1) the firm's profitability, (2) cash flow, and (3) credit quality (ability to service debt). Indeed, to arrive at EBITDA, the preparer adds back depreciation and amortization, which are noncash expense items of the current fiscal period and do not affect current cash flow. According to some, adding interests and taxes back makes the metric more comparable across firms (D'Souza, Ramesh and Chen 2010). Before studying determinants of EBITDA disclosures, in the next section we investigate the properties of EBITDA as a measure of firm performance and shed light on the above-mentioned critiques.

3 – Evaluating EBITDA as a measure of firm performance

3.1 – EBITDA lies Outside of GAAP and IFRS

EBITDA is not defined and standardized in US GAAP or IFRS. As a consequence, a pro-forma earnings number like EBITDA may appear as an unaudited number in the financial statements which also affects its credibility (Ball 1989; Ball, Jayaraman and Shivakumar 2012). Despite objections of regulators, firms often include and exclude items at will. [3] Firms can mitigate some concerns by reconciling EBITDA with the GAAP number of net income. However, even if the number is reconciled, the use of the non-GAAP number may still detract or deprive investors from relevant information. Sherman and Young (2016) argue

investors" ... because it's thought to provide a quick proxy for the amount of cash flow available to service debt." At first sight, EBITDA can indeed be considered as a cash flow measure. Similar to how operating cash flow is assessed in the cash flow statement, depreciation and amortization, many firms' most relevant operating noncash expense items, are added back to earnings. However, for many firms EBITDA is not close to cash flow for two reasons. First, interest and tax expenses involve a clear and important cash outflow, yet they are added back to earnings to produce an EBITDA number. It is not unequivocally clear why some cash flow elements are added back and others not. Based on the findings in existing literature it would appear that interests (e.g., Sengupta 1998) and taxes (e.g., Laux 2013) constitute relevant cash outflows. One could argue that interests, a nonoperating item, need to be added back to assess operating cash flow. Tax expense is more dubious as it constitutes both a cash outflow and an operating item. Second, and often overlooked by practitioners, EBITDA does not take into account the capital and cash required to fund a firm's operating activities, which does influence operating cash flow. [4] EBITDA starts with "earnings" and nowhere in its calculation are changes in working capital addressed. Acknowledging working capital requirements is highly relevant for cash flow analyses and liquidity risk purposes, and even more so for firms with long cash conversion or long operating cycles.

3.3 – EBITDA as a measure of (operating) earnings

Next, we consider how accurately EBITDA captures economic performance of a company and compare it with earnings. From a valuation standpoint, one can raise objections against ignoring interest, taxes and depreciation and amortization. First, the literature suggests that each of these items are relevant to the users of financial statements when assessing the value of a security. See, for instance, on interest relevance: Sengupta (1998) and Christensen, Lee and Walker (2009); on tax relevance: Hanlon and Heitzman (2010) and Laux (2013); on depreciation relevance: Beaver and Ryan (2000) and Kang and Zhao (2010). Second, these three items differ substantially from one another in nature: Interest expense is a cash nonoperating expense; tax expense is a cash operating expense; depreciation and

company would realize in case it is fully financed with equity, i.e. making abstraction of how management decides to finance the operations. Li (2016) observes that EBITDA is less useful in explaining credit risk than bottom-line earnings. EBITDA-based covenants are often chosen to make the performance measure less sensitive to capital expenditures. In our analyses, we calculate net operating profit by re-calculating the amount of tax that the company *would* have paid had interest deduction been impossible. Net operating profit provides investors with a clean measure of operating profitability. [5]

Tax. Proponents of pretax measures often argue to add back tax expense because tax treatment differs across regimes and industries, and some firms have more ability to lower tax charges than others. EBITDA also ignores tax expenses. However, taxes usually are a highly relevant operating expense. Taxes recur every year and form a substantial expense for most companies. Moreover, tax liabilities must always be settled. Therefore, it is debatable on whether investors are better served with a pre rather than post tax measure. If, for some reason (for instance for comparability purposes) one would like to have an operating profitability measure *before* tax, almost all firms provide an item in the income statement labelled: 'operating income'. [6] Again, more appropriate alternatives than EBITDA are available.

Depreciation and amortization. EBITDA adds back depreciation and amortization, often with the argument that these are irrelevant expense items or items prone to managerial discretion. Yet, there are reasons for why depreciation and amortization expenses appear in the income statement. They constitute real economic expenses. Capital is not free and not freely renewable. Buffet (2002, p. 14) commented on EBITDA in the following terms "After September 11th, training for commercial airlines fell, and today it remains depressed. However, training for business and general aviation, our main activity, is at near-normal levels and should continue to grow. In 2002, we expect to spend $162 million for 27 simulators, a sum far in excess of our annual depreciation charge of $95 million. Those who believe that EBITDA is in any way equivalent to true earnings are welcome to pick up the tab." This comment suggests that the accrual-based operating income number reflects the

capture either of these concepts accurately. In the remainder of this section, we describe empirically how EBITDA differs from earnings and cash flows. We draw data from Compustat, consider all US stock-listed firms between 1988 and 2016. [7] The total sample contains 162,626 firm-year observations. We assess 17 ratios in three categories. The earnings-based ratios (1-8) break down in three types: net income, net operating profit and operating income (before tax). The cash flow-based category (9-14) comprises ratios based on free cash flow and operating cash flow. The last category consists of EBITDA ratios (15-17). Within each category, we use different scalers to control for sensitivity. For instance, net income is scaled by sales, assets and equity giving rise to three widely used profitability ratios: ROS, ROA and ROE. Net operating profit is scaled by sales and net operating assets (NOA).

In Table 1 Panel A we calculate median values for the full sample, the S&P 500 and the DOW 30. EBITDA-based ratios persistently surpass *any* of the other ratios, in *every* subsample. Moreover, the extent to which EBITDA ratios exceed other measures is large and significant. Operating profit before tax and operating cash flow ratios are at least 4% of sales, 4% of assets and 7% of NOA lower than equivalent EBITDA ratios. The median firm in the S&P 500 realized an after-tax operating return of 12.55 $ and an operating cash inflow of 19.20 $ for every 100 $ invested in its net operating assets. These number are far below the 27.32 $ of EBITDA per 100 $ invested. When focusing on the free cash flows, we notice that the median DOW 30 firm attains a margin of 7.91%, in big contrast to the EBITDA margin of 23.3%.

In Table 1 Panel B we construct quartiles based on ROE, Net operating profit margin and Operating cash flow on assets of the S&P 500 sample. For each quartile, we calculate the median of EBITDA/Sales, EBITDA/Total Assets and EBITDA/NOA. We find that the EBITDA ratios are much higher than any of the three other measures, for all quartiles. More importantly, we notice that EBITDA ratios display a favorable outlook of firm performance compared to what earnings and cash flows show. For the quartile with the lowest ROE, we only find positive EBITDA ratios. Results generally show that EBITDA exceeds the alternative metrics for all firms. For instance, firms in the second quartile of net operating profit margin

operating cash flow for two thirds of the total sample, for 85% of S&P 500 and for 90% of DOW 30 firms.

Collectively, these descriptive findings indicate that EBITDA exceeds most conventional earnings and cash flow metrics. Therefore, it may serve as an ideal number for management to emphasize in case it wants to overstate firm performance. Anecdotal evidence shows that EBITDA is indeed a widely used metric by both managers and other finance professionals, although far from all firms disclose and comment on their EBITDA. The next section formally describes our predictions regarding which firms are more likely to emphasize EBITDA and which are not, followed by our model design and regression analyses.

4 – Hypothesis Development

The inclination of managers to overstate their results has been documented in the literature. Bowen, Davis and Matsumoto (2005) and Israeli (2015) demonstrate that managers present their investments opportunistically. Barth, Gow and Taylor (2012) show that many firms are reluctant to report stock-based compensation as an expense item. Many managers continue to use and emphasize such numbers in an attempt to affect investors' reading of the firm's financial condition (WSJ, August 2016). Our previous discussion indicates that EBITDA disclosures can be interpreted by investors as lower quality disclosures and an attempt by the management to window-dress the firm's performance. Moreover, EBITDA has drawn recent criticism from the regulators such as the SEC and is often times negatively looked upon in the business press (e.g. Forbes 2003). For these reasons, it is not straightforward whatsoever to consider EBITDA as a "boilerplate" disclosure to show company performance.

First, we test whether firms with a richer and higher-quality information environment are less likely to engage in EBITDA disclosures. Firms with more visibility stand a better reputation to defend. They usually face more scrutiny and monitoring than smaller firms. More reputed and transparent firms typically have more to lose from opportunistic

hypothesis:

H1: EBITDA-disclosing firms are smaller and have lower analyst forecast accuracy than firms which do not disclose EBITDA.

Managers of firms with lower profitability than peers and firms with a lower expected profitability have higher incentives to provide information to investors that suggests the firm's future outlook still is favorable and sufficiently profitable. One strategy managers may have is to disclose non-GAAP information which improves the outlook of the firm's current and future performance. Our previous section has identified EBITDA as particularly suited for this purpose, as EBITDA most of the times exceeds other metrics such as operating profit or operating cash flow. If EBITDA is indeed applied as a disclosure tool to provide a positive impression of profitability, we expect firms with lower current and anticipated profitability to be more likely to disclose EBITDA as it serves them better. Therefore, our second hypothesis is:

H2: EBITDA-disclosing firms exhibit lower current and expected profitability than firms which do not disclose EBITDA.

Next, we consider the three items that EBITDA makes abstraction of, depreciation (and amortization) expense, interest expense and tax expense, which are added back to net income. We predict that more capital intensive firms are more likely to emphasize and disclose EBITDA. This hypothesis hinges on two principal arguments. First, managers are expected to be more likely to use EBITDA as a tool to window-dress performance when there is a bigger wedge between operating income (or EBIT) and EBITDA. Firms with more long-term assets on their balance sheet typically have higher amounts of depreciation and amortization expenses. EBITDA disclosures are expected to have a larger impact on investor's expectations when the items that are added back to net income constitute larger amounts. There is also a second potential effect. To the extent that managers engage in overinvestment in their firm's operations, they may attempt to obfuscate these investment activities by emphasizing EBITDA instead, which is unaffected by investment actions (Li 2016). Therefore, we formulate the following hypothesis:

finance these with debt have higher interest expenses. When levels of debt and interest expenses are high, the utility for the manager to enhance the performance outlook of the company and the incentive to disguise over-investment activity is higher. Therefore, we predict that firms with, ceteris paribus, higher amounts of interest expense are more likely to disclose and emphasize EBITDA numbers in their financial communication. The next hypothesis is:

> *H3b: EBITDA-disclosing firms have higher amounts of interest expense and higher leverage than firms which do not disclose EBITDA.*

Next, EBITDA also counts back tax expense. However, we do not expect that firms disclosing EBITDA necessarily have higher tax expenses. In hypothesis 2 we expect these firms to be less profitable. As a consequence, their pre-tax numbers may be lower. We expect these two opposite effects to counterbalance each other. Therefore, we state the following hypothesis in the null form:

> *H3c: EBITDA-disclosing firms do not have a different tax expense rate than firms which do not disclose EBITDA.*

In addition, we consider the difference between operating cash flow and EBITDA. When reconciling earnings with operating cash flow, typically increases in working capital, measured as changes in operating current assets minus changes in operating current liabilities, are subtracted. Positive working capital requirements negatively affect cash flow, but not net income nor EBITDA. Firms with longer operating cycles typically need to invest more in working capital (such as receivables and inventories), especially when they exhibit growing sales. For these firms, EBITDA is much higher than operating cash flow and free cash flow. Their managers are expected to find greater utility in disclosing EBITDA than firms with shorter operating cycles. Our fourth hypothesis is:

> *H4: EBITDA-disclosing firms are more likely to have longer operating cycles and higher working capital requirements than firms which do not disclose EBITDA.*

In our final hypothesis, we look into whether earnings expectations have been missed or not.

than firms that have met or beaten the analyst forecast. Our fifth and final hypothesis is:

> *H5: EBITDA-disclosing firms are more likely to have missed analyst forecasts than firms which do not disclose EBITDA.*

5 – Empirical evidence on the prevalence of EBITDA in financial reporting

5.1 – Sample selection

We search for EBITDA disclosures in 8-K and 10-K EDGAR filings for firms belonging to the S&P 1500 for the period 2005-2016. [9] In total, we are able to extract 22,354 annual reports and 57,911 press releases containing earnings announcements. On each of these reports we conduct a word search on the term "EBITDA". All company data is downloaded from WRDS Compustat. After matching the reports with Compustat and removing observations with missing data on market capitalization, total assets, sales, net income, book value of equity, capital expenditure, R & D and cash, we have a sample of 15,895 annual reports and 51,758 earnings releases which we use for our main regression analyses.

5.2 – Descriptive statistics

We find that on average 14.8% of sample firms mention EBITDA at least three times in their annual report. About one fourth, 24.8%, mention EBITDA at least once, while 7.4% mention EBITDA ten times or more. Further, we find that 54.1% of firms (or 1,307 firms) never disclose EBITDA in *any* of the years between 2005 and 2016, while 9.1% (or 219 firms) mention EBITDA in *every* annual report. 137 firms disclose EBITDA at least three times in *every* year between 2005 and 2016. Table 2 Panel A provides the percentage of firms in each Fama-French industry that report EBITDA three times or more.

Next, we evaluate the prevalence of EBITDA disclosure in annual reports over time. Figure 1

Next, we investigate the stickiness of EBITDA disclosures. The probability that a firm disclosing EBITDA in the current year still does so in the next fiscal period ranges between 80% (2005-2006) and 93% (2011-2012). These probabilities lie between 77% and 86% for two-year ahead EBITDA disclosure and between 74% and 81% for three-year ahead EBITDA disclosure. Further, Table 2 Panel B shows that on average 26 firms stop reporting on EBITDA while 48 firms start to report it. For instance, in 2006 19 firms stop reporting EBITDA, while 25 others initiate EBITDA disclosure. In most years, the number of firms starting to disclose EBITDA is larger than the number of firms stopping to report it, with 2009 as the year in which this difference was largest. We conclude that EBITDA disclosures are quite pervasive over time.

6 – Empirical evidence on determinants of EBITDA disclosures

6.1 – Model Design

To test the five hypotheses, we employ the following regression specification:

$$EBITDA_{it} = FirmSize_{it}\alpha_1 + ROA_{it}\alpha_2 + Leverage_{it}\alpha_3 + Market\ to\ Book_{it}\alpha_4 + Sales\ Growth_{it}\alpha_5 + Capital\ Intensity_{it}\alpha_6 + Intangibles_{it}\alpha_7 + Interest\ Exp_{it}\alpha_8 + Tax\ Rate_{it}\alpha_9 + Change\ in\ WC_{it}\alpha_{10} + Forecast\ Miss_{it}\alpha_{11} + Forecast\ Error_{it}\alpha_{12} + Cash_{it}\alpha_{13} + R\ \&\ D_{it}\alpha^{14} + Capex_{it}\alpha_{15} + Industry\ Controls + Year\ Effects + \varepsilon_{it}$$

The dependent variable, $EBITDA_{it}$, is an indicator variable equal to 1 if firm *i* in year *t* discloses EBITDA three times or more in the 10-K annual report, and zero otherwise. We choose three disclosures or mentioning of EBITDA, to make sure we capture firms that explicitly talk about their EBITDA. In additional analyses, we rerun our tests setting the criterion at 1, 2 or 10 mentioning(s) of EBITDA. Results are qualitatively the same. In equivalent tests, we test for EBITDA disclosures in earnings announcement reports. We

alternatives, we consider the log of sales and assets. We expect a negative coefficient. To test Hypothesis 2, we introduce *ROA*, return on assets, measured as net income on total assets. We also measure *Market to Book*, which is a conventional indicator of (future) growth opportunities. We predict the coefficient on these variables to be negative. *Sales Growth*, the percentage increase in annual revenues, is also added as a measure for (current) growth. However, the coefficient on *Sales Growth* may go either way. Firms with increasing sales have higher working capital requirements. In Hypothesis 4 we predict these firms to be more likely to disclose EBITDA. Therefore, when considering sales growth as a measure of both growth opportunities and working capital requirements, under Hypothesis 2 we expect it to be negative while under Hypothesis 4 we expect it to be positive. *Capital Intensity*, measured by property, plant and equipment, and *Intangibles*, intangible assets (excluding goodwill) are both scaled by total assets and introduced to test Hypothesis 3a. We predict to find positive coefficients on *Capital Intensity* and *Intangibles*. Hypothesis 3b is tested by including *Leverage*, measured as total debt scaled by assets, and *Interest Exp*, the interest expense number stemming from the income statement scaled by sales. We expect positive coefficients on these variables. *Tax Rate* is the effective tax rate calculated by the actual tax expense scaled by pretax income. *Tax Rate* is included to test Hypothesis 3c and we have no prediction for the sign of its coefficient. To test our hypothesis 4, we include the changes (or growth) in working capital, *Change in WC*, measured by operating current assets minus operating current liabilities, scaled by total assets. *Change in WC* is positive for firms with higher working capital requirements. We predict to find a positive coefficient. To test hypothesis 5, we introduce *Forecast Miss*, an indicator variable equal to 1 if the company has missed the last consensus analyst forecast and zero if the it has met or beaten the forecast. Finally, we include *Forecast Error*, measured as the absolute difference between actual EPS and forecasted EPS scaled by lagged stock price, as an alternative indicator for the quality of the firm's information environment to test Hypothesis 1. We expect a negative coefficient on *Forecast Error*. [11]

We also include corporate cash holdings, *Cash*, research and development expense (*R & D*)

Consistent with the notion that firms with a better information environment firms are less likely to engage in disclose EBITDA, we find that EBITDA-reporting firms are significantly smaller and have higher forecast errors. Also, EBITDA-reporting firms are less profitable (lower ROA) and more likely to be loss firms. However, EBITDA-reporting firms do not have lower growth opportunities or lower current growth rates. Next, we find that EBITDA-reporting firms are more capital intensive, carry more debt on their balance sheet and pay more interests. Tax rates are not different. EBITDA-reporting firms have longer operating cycles and higher increases in working capital, and they are more likely to have missed the earnings benchmark set by analyst forecasts.

6.3 – Multivariate analysis: main specification

Table 4 shows results from our main regression model. In Panel A, the dependent variable is an indicator for EBITDA disclosure in annual reports. In the first specification we include *Firm Size*, *ROA* and *Leverage* as test variables. We find that EBITDA-reporting firms are significantly smaller. The coefficient on *Firm Size* remains significantly negative throughout all specifications and turns out to be the most important predictor of the probability that a firm discloses EBITDA. In specification 5, we find a positive coefficient on *Forecast Error*, indicating that firms with a lower quality information environment are more likely to disclose EBITDA. For these reasons, we conclude to find strong evidence for Hypothesis 1. We find that EBITDA is mainly disclosed by smaller, less visible and less reputed firms, in line with the notion that these firms face less scrutiny from investors and less pressure to provide high-quality disclosures. *ROA* does not carry a significantly negative coefficient. *Market-to-Book* and *Sales Growth* are not significant, implying that we are unable to find evidence for Hypothesis 2. However, we notice that *Leverage* always carries a significantly positive coefficient, consistent with Hypothesis 3b. Also, when in specification 3 *Interest Exp* is included, we find a positive coefficient, even if *Leverage* continues to be in the model. Testing Hypothesis 3a, we include *Capital Intensity* and *Intangibles*. We find a modestly positive coefficient on *Capital Intensity* and a strong positive coefficient on *Intangibles*,

coefficient on *Forecast Miss*, consistent with Hypothesis 5 that firms missing the analyst forecast benchmark are more likely to focus on EBITDA. Finally, our model is found to be significant in explaining the probability of a firm disclosing EBITDA, as the R-square values are high given the large number of observations. Also, unreported statistics show that the model classifies 85.5% of observations correctly.

In Panel B of Table 4, the dependent variable is an indicator for EBITDA disclosure in press releases containing earnings announcements. We consider the equivalent tests for earnings releases as highly important to our study for two reasons. First, the number of observations is almost four times larger, as there are multiple earnings announcements per fiscal period. Second, earnings announcements are a more focused and timely disclosure tool for firms to communicate with investors about their performance. Annual reports contain many other disclosure items, such as governance and social issues, while press releases on earnings announcements are focused on profitability. In line with Hypothesis 1, we again find a strong negative effect of *Firm Size* on the likelihood of EBITDA disclosure. However, we now also find evidence consistent with Hypothesis 2 as *ROA* also carries a negative coefficient. Consistent with Hypothesis 3a and Hypothesis 3b, we find positive coefficients on *Capital Intensity, Intangibles, Leverage* and *Interest Exp*. The coefficient on *Change in WC* is not significant (p-value is 0.13). However, closer analysis shows that this is due to the large correlation this variable has with *Sales Growth*, which consistently shows a positive coefficient in this table. This finding is consistent with the notion that firms with increasing sales have higher working capital requirements and therefore more likely to disclose EBITDA (Hypothesis 4). Indeed, when we omit *Sales Growth* from the model in specification (4), we find a positive coefficient on *Change in WC* (p-value of 0.08). The model classifies 82.3% of observations correctly.

In what follows, we discuss the results from four important additional analyses that we execute to further understand how and which firm traits relate to EBITDA disclosures.

6.4 – Changes specification

dependent variable, which is an equivalent estimation procedure as running a regression of changes on changes (see, for instance, Opler, Pinkowitz, Stulz and Williamson 1999). Specifically, we add *EBITDA in Prior Year* to the model. *EBITDA in Prior Year* is an indicator variable equal to one if the firm has disclosed EBITDA in the previous fiscal period. This procedure constitutes as a particularly powerful test to investigate which firm characteristics explain whether a firm discloses EBITDA in the current year given that it has not done so in the previous year, or vice versa.

Table 5 Panel A presents results for EBITDA disclosures in annual reports. We immediately notice a strong increase in the predictive power of the model attaining R-square values around 55%. This should not come as a surprise given that our descriptive statistics have already shown that EBITDA disclosures are quite sticky over time. However, the predictability is not (close to) 1, so there remains considerable variation to be explained in the probability that a firm discloses EBITDA provided that it has (or has not) disclosed EBITDA previously. Most important for our study is that we again find strong evidence for our Hypotheses 1, 3 and 4. Specifically, we continue to find significantly negative coefficients on *Firm Size* and positive coefficients on *Leverage* in all specifications. Although the amount of tangible assets does not seem to matter that much anymore, we continue to find that firms with higher *Intangibles* have a higher likelihood of disclosing EBITDA. Next, we find a strongly positive coefficient on *Change in WC*, in line with Hypothesis 4. Finally, the coefficient on *Forecast Miss* is weakly positive, in line with Hypothesis 5.

Table 5 Panel B shows results for changes in EBITDA disclosures in earnings announcements. In this case, we test for the probability that a firm discloses EBITDA in the current earnings release, controlling for whether the firm has disclosed EBITDA in the previous earnings announcement or not. We find negative coefficients on *Firm Size*, consistent with Hypothesis 1. Equally important is that we find a negative and highly significant coefficient on *ROA*, in line with Hypothesis 2. Firms with lower ROA have a significantly higher probability of starting to disclose EBITDA, while firms with higher ROA have a higher probability of stopping to report on EBITDA. *Leverage* carries a significantly

counts or more) and earnings announcement reports (1 count or more). However, using a binary indicator as the dependent variable does not allow us to investigate determinants of the intensity or prevalence of EBITDA disclosures. Therefore, we introduce *EBITDA Count*, which equals the number of times EBITDA is mentioned. As this number is highly positively skewed, we measure *EBITDA Count* as the log of (1+ number of EBITDA disclosures). As many firms never mention EBITDA even once, *EBITDA Count* equals zero for many observations. Therefore, we test the model as a Tobit specification, with left censoring at zero.

Results on EBITDA intensity are summarized in Table 6. We test *EBITDA Count* in the annual reports (Panel A) and in earnings announcement reports (Panel B). In specifications (1)-(4) of Panel A all firms are included. In line with Hypothesis 1 we find that larger firms and firms with lower forecast errors have fewer EBITDA mentions. We do not find evidence for Hypothesis 2, but we do for Hypotheses 3a and 3b as the coefficients on *Leverage, Interest Exp, Capital Intensity* and *Intangibles* all carry a positive sign. Consistent with Hypotheses 4 and 5, we find that firms with larger increases in working capital and firms missing the analyst forecast benchmark are emphasizing EBITDA more than other firms. In specifications (5) and (6), we only consider firms that disclose EBITDA at least once. In other words, we test for EBITDA intensity given that the firm mentions EBITDA. We test these specifications as a regular OLS model. We find that firms with higher leverage, higher interest expenses and higher capital intensity emphasize EBITDA more than others. *Firm Size* and *Change in WC* are no longer significant. [14]

When testing the intensity of EBITDA disclosures in earnings announcements (Panel B), in specifications (1)-(3) we find significant coefficients on *Firm Size, ROA, Leverage, Capital Intensity, Intangibles* and *Interest Exp*, in line with expectations under Hypotheses 1, 2 and 3. When only considering EBITDA disclosing firms in specifications (4) and (5), we also find evidence consistent with Hypothesis 1: smaller firms emphasize EBITDA more strongly, even among EBITDA disclosers. Further, we find that firms with more intangibles, higher

disclosures. In a first set of additional tests, we investigate the likelihood of firms mentioning "Adjusted EBITDA" and "EBITDAR". Adjusted EBITDA usually adds further items to earnings such as stock-based compensation expense, leading to an even higher number than EBITDA. Adjusted EBITDA is mentioned at least once in the annual report by 8.9% of the firms. EBITDAR most often stands for EBITDA before rental expense on a tangible asset item. EBITDAR is disclosed by 1.1% of companies. We test which firm characteristics predict the disclosure of adjusted EBITDA and EBITDAR. Results are summarized in Table 7.

We consider Adjusted EBITDA and EBITDAR as comparable measures in nature and consider them separately (in specifications (1) and (2)) and combined (in specifications (3)-(6)). The first four specifications focus on disclosures in the annual report and the latter two on earnings announcement reports. In specifications (1), (2), (3) and (5) all firms are considered and in specifications (4) and (6) only EBITDA disclosing firms enter the sample. [16] From specifications (1) to (3) we see that firms disclosing Adjusted EBITDA or EBITDAR are significantly smaller, less profitable and higher levered. They also have more tangible and intangible assets, providing strong evidence for Hypotheses 1, 2, 3a and 3b. The magnitude of the coefficients is generally larger than in Table 4, in line with the idea that adjusted EBITDA measures are more opportunistic in nature than EBITDA disclosures. Interestingly, when only considering EBITDA reporting firms (specification (4)), we still find that firms disclosing Adjusted EBITDA or EBITDAR are smaller, less profitable and more capital intensive. When testing equivalent specifications (5) and (6) for adjusted EBITDA disclosures in earnings announcements we find very similar results, with highly significant coefficients for *Firm Size*, *ROA* and *Leverage* in the predicted directions. Finally, we note that *Sales Growth* is positively associated with the disclosure of adjusted EBITDA numbers. This finding is in line with what Brown, Christensen, Menini and Steffen (2017) report in a recent paper as they find that IPO firms frequently disclose adjusted EBITDA.

6.7 – EBITA and EBIT disclosures

concept of EBIT or operating income is much more accepted as a measure of operating performance. Therefore, we expect to find weaker results than we did so far and we do not expect our hypotheses to longer hold. Results are summarized in Table 8.

In Panel A we show results for EBITA and EBIT disclosures in annual reports, including all our test variables and in Panel B we test for these disclosures in earnings announcements. [18] In both panels, it is immediately clear that the firm characteristics are not as good in explaining the disclosure of EBITA and EBIT as they are in explaining EBITDA disclosures. We derive this conclusion from both the low amount of significant explanatory variables in the model and the much lower R-squared. This result is in line with our predictions.

One particular result we would like to highlight is the coefficient on *Intangibles*. When testing for the disclosure of EBITA (specifications (1) and (2)), we find a significantly positive coefficient on *Intangibles*, as we did when testing for the disclosure of EBITDA in Table 4. This finding is in line with the prediction that firms with more intangible assets typically have higher amortization amounts and will therefore be better served when showing a measure excluding this expense item. EBITDA and EBITA indeed exclude amortization expense. However, EBIT does not exclude this item and in specifications (3) and (4) we indeed no longer find a significant coefficient on *Intangibles*. Equally worth mentioning is that the coefficient on *Capital Intensity*, an indicator of depreciation expense, is not significant in explaining either EBITA or EBIT, while we did find a positive coefficient on *Capital Intensity* when testing for EBITDA disclosures.

6.8 – Complementarities among EBITDA-related disclosures

In a final set of analyses, we investigate any complementary effects in disclosure of EBITDA, adjusted EBITDA, EBITDAR, EBITA and EBIT. For instance, to what extent is the likelihood of a firm disclosing adjusted EBITDA related to whether EBITDA is also disclosed? Results are summarized in Table 9. In Panel A, we show the proportion of firms disclosing (1) *EBITDA*; (2) EBITDAR or adjusted EBITDA (jointly labelled *Adjusted EBITDA*) and (3) *EBITA or EBIT* (as one category), relative to each other. [19] Results convey that, of all firms not

would limit at these acting as substitutes rather than complements. However, the differences are small. Finally, we find that firms not disclosing any adjusted EBITDA figure, have a probability of 8.46% to disclose EBIT or EBITA, while this probability is only 3.54% for firms that do provide an adjusted EBITDA figure suggesting that these two sets of metrics do not tend to be disclosed together.

Following up on the previous test, we redo our main tests and include an indicator on the disclosure of an alternative measure. Untabulated results show that the presence of adjusted EBITDA positively relates to the likelihood of EBITDA disclosure, both in annual reports and in earnings announcement reports. We fail to find any significant association between EBIT (or EBITA) disclosure and EBITDA disclosure likelihood, and neither between EBIT (or EBITA) and adjusted EBITDA.

In our sample we find that 26.3% of the firms provide at least one of the five non-GAAP measures considered in this study and 6.3% provide two or more of these measures in the annual report. To further investigate why some firms choose to disclose only one measure while others provide multiple measures, we run an ordered logit model with the sum of indicator variables for the disclosure of Adjusted EBITDA, EBITDAR, EBITDA, EBITA and EBIT as the dependent variable, ranging from 0 to 5. Results are shown in Panel B of Table 9. In specifications (1) and (2), for disclosures in annual reports, and in specification (4), for earnings announcements, we find coefficients of similar significance and interpretation as those reported in the main tables. Small firms, capital-intensive firms, highly leveraged firms and firms with more working capital needs disclose a higher amount of non-GAAP metrics. Specifications (3) and (5) provide a stronger test as observations without non-GAAP disclosures are dropped. All firms in these tests disclose at least one of the five considered measures. [20] Interestingly, we find strong evidence for the notion that firms disclosing multiple non-GAAP measures are significantly smaller and more leveraged than firms only disclosing one of such measures.

In a final test on interdependencies between non-GAAP measures, we shed light on whether

when EBIT is negative, compared to when EBIT is positive.

Results are shown in Panel C of Table 9. In specifications (1) and (3), we include *EBITDA Loss*, an indicator variable equal to 1 if EBITDA is negative, zero otherwise. We deliberately test a short model and leave out control variables which would otherwise even further decrease the sample size. In specifications (2) and (4), we include *EBIT Loss*, an indicator variable equal to 1 if EBIT is negative and zero otherwise. We also exclude ROA, to avoid multicollinearity. In line with expectations, we find a significantly negative coefficient on *EBITDA Loss* in specification (1). This result suggests that firms with negative EBIT but positive EBITDA are more likely to disclose EBITDA in their annual report than firms with both negative EBIT and negative EBITDA. Although weaker, we find a similar result in specification (3), testing for EBITDA disclosures in earnings announcements. In specifications (2) and (4), we do not find that firms with a negative EBIT are more likely to disclose EBITDA. However, the coefficient on *EBIT Loss* is positive in both cases and close to being significant with p-values of 0.13 in specification (2) and 0.16 in specification (4).

7 – Conclusion

EBITDA is a popular financial metric often disclosed to report on company performance. EBITDA serves as a hybrid financial concept that combines elements of both earnings and cash flows. However, EBITDA conveys both cash flow and accrual information in an imperfect manner, leaving the financial statement user with the question what incremental information EBITDA actually conveys about the performance of a company. By design of EBITDA, the number is (almost) always higher than any conventional earnings or cash flow number. American as well as international oversight bodies have raised concerns to such an extent that the IASB does not want to define EBITDA and the SEC may start regulating it. We conjecture that EBITDA numbers distract the attention from economic events relevant to investors.

We find that 25 percent of firms report EBITDA numbers in their annual report, while 18

Our empirical analyses show that EBITDA-reporting firms are smaller than firms that never talk about EBITDA, and have larger analyst forecast errors. This finding is consistent with the notion that potential reputation loss of providing low quality financial information is lower for smaller firms than for more reputed firms. EBITDA-reporting firms also carry more debt on their balance sheet, have a higher probability of missing the earnings benchmark set by analysts, and invest more in tangible and intangible long-term assets. One particular result, and never documented in the literature, is that firms with higher and increasing requirements for working capital are more likely to disclose EBITDA. Until now, the literature has mostly focused on items left out of non-GAAP earnings compared to earnings, not compared to cash flows. Therefore, this latter result carries an important implication for the non-GAAP literature, in that, it suggests managers do not merely seek to make earnings look better, but also (operating) cash flow. Another contribution to the literature is that we investigate determinants of adjusted EBITDA disclosures, including EBITDAR. We find strong evidence consistent with the idea that these disclosures are used in an opportunistic fashion to over-present performance. We find only weak evidence that EBITA and EBIT are disclosed for opportunistic reasons. In sum, we contribute to the literature by providing evidence that EBITDA, and its adjusted measures, are well-suited financial metrics to window-dress performance and provide a rosier picture of the company than what is shown by conventional earnings and cash flow measures.

We acknowledge that in our paper we primarily ask the question why firms choose to show EBITDA numbers. We do not claim that the use of EBITDA has negative effects for investors or that EBITDA disclosures should always be interpreted as opportunistic. Rather, our findings imply users of financial information to be cautious when management emphasizes EBITDA. EBITDA measures are used intensively in practice and we could only provide some answers of why that is. In debt covenants, EBITDA plays almost without exception a prime role. We leave it to future work to enhance our understanding of why lenders would benefit if they contract on EBITDA numbers instead of regulated numbers. Another potentially fruitful avenue for future research is to investigate substitution and complementary effects

a first step towards that research objective.

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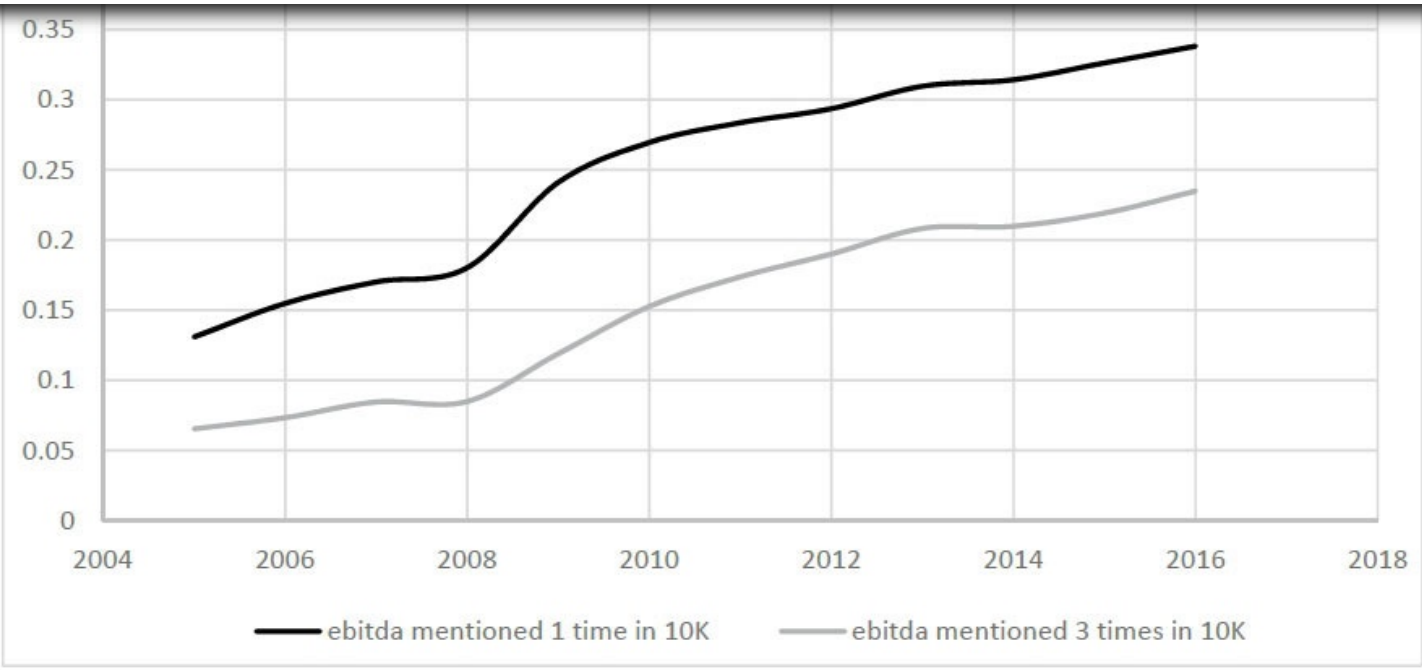
Appendix

List of Variables

Variable	Definition
Capex	Capital expenditure scaled by total assets
Capital Intensity	The amount of property, plant and equipment (net) scaled by total assets
Cash	The amount of cash and cash equivalents scaled by total assets
Change in WC	Change in working capital measured by the yearly change in current operating assets (current assets minus cash and cash equivalents) minus the yearly change in current operating liabilities (current liabilities minus short-term debt and other nonoperating current liabilities), scaled by total assets. A positive change indicates an increase in the need for working capital.
Cycle	Operating cycle of a firm's operations measured as inventories plus accounts receivable minus accounts payable, scaled by total assets.
Drop in earnings	Indicator variable equal to 1 if the firm has registered a drop in earnings compared to the previous period, zero otherwise.
EBITDA	Indicator variable equal to 1 if the firm has mentioned "EBITDA" three times or

Prior Year	more in the previous year annual report (10-k from EDGAR) or the previous earnings announcement, zero otherwise.
EBITDA Count	The natural log of one plus the number of times "EBITDA" is mentioned in the annual report or earnings announcement report.
EBITDA Loss	Indicator variable equal to 1 if the firm has a negative EBITDA in the current fiscal period, and zero otherwise.
EBIT Loss	Indicator variable equal to 1 if the firm has a negative EBIT in the current fiscal period, and zero otherwise.
Firm Size	Market capitalization measured as the stock price per share at the end of the fiscal period multiplied by the number of shares outstanding.
Forecast Error	The absolute difference between actual EPS and forecasted EPS, scaled by lagged price per share. Earnings forecasts and actual earnings are retrieved from IBES. We use the average last consensus forecast of one-year ahead EPS available.
Forecast Miss	Indicator variable equal to 1 if actual EPS is lower than the average last consensus forecast of EPS, and zero otherwise. Earnings forecasts and actual earnings are retrieved from IBES.
Free Cash Flow	Net operating profit minus changes in net operating assets. Free cash flow is defined as in Penman (2013).
Intangibles	The amount of intangible assets (excluding goodwill) scaled by total assets.
Interest Exp	The interest expense as mentioned in the income statement scaled by revenues.
Leverage	The total amount of debt a firm has on its balance sheet (long-term and short-term) scaled by total assets.
Loss firm	Indicator variable equal to 1 if the firm has registered a loss (net income < 0),

Operating Profit	profit minus tax shield. Tax shield is actual tax expense plus the statutory tax rate multiplied by nonoperating expenses (e.g. interest expenses). Sometimes referred to as NOPAT, or net operating profit after tax.
NOA	Net operating assets defined as operating assets minus operating liabilities. Operating assets include accounts receivable and inventories and exclude cash and equivalents. Operating liabilities include accounts payable, wages payable, pension liabilities and exclude debt. We refer to Easton, McAnally, Sommers and Zhang (2015) for a detailed discussion.
Operating Cash Flow	Operating cash flow number as it appears on the cash flow statement (sometimes referred to as (net) cash flow from operations) and measured as the cash inflow that stems from operating activities of the firm.
Operating Profit	Sales minus operating expenses including cost of sales, S,G&A and R&D, before tax.
ROA	Return on assets measured as net income (before extraordinary items) scaled by total assets.
ROE	Return on equity measured as net income (before extraordinary items) scaled by book value of equity.
ROS	Return on equity measured as net income (before extraordinary items) scaled by total revenues.
R & D	Research and development expense scaled by total revenues.
Sales growth	The percentage change in annual revenues.
Tax Rate	The effective tax rate of a firm measured as the tax expense scaled by pre-tax income.



EBITDA Reporting over time
This figure shows how reporting of EBITDA in 10-K's has evolved over time for the period 2005-2016 for stock-listed firms belonging to the S&P 1500 index. The blue line shows the percentages of annual reports that contains at least 1 EBITDA mention and the red line denotes the percentage of firms that mention EBITDA at least 3 times.

Table 1

Comparison of EBITDA with Other Earning s and Cash Flow Measures

Panel A: Median Values of Cash Flow, Earnings and EBITDA Ratios

Type	Metric	Definition	Total Sample	S&P 500	DOW 30
Net Income					
1.	ROS	Return on Sales	1.64%	7.11%	9.70%
2.	ROA	Return on Assets	1.53%	5.93%	8.13%
3.	ROE	Return on Equity	7.87%	14.72%	20.04%

Operating Profit (Before tax)					
6.	OPER_PROF/SALES	Operating Profit Margin	4.66%	13.16%	17.15%
7.	OPER_PROF/TA	Operating Profit on Assets	4.84%	10.52%	12.51%
8.	OPER_PROF/NOA	Operating Profit on NOA	10.67%	19.08%	25.03%
Free Cash Flow					
9.	FCF/SALES	Free Cash Flow Margin	-0.39%	4.96%	7.91%
10.	FCF/TA	Free Cash Flow on Assets	-0.98%	4.82%	6.54%
11.	FCF/NOA	Free Cash Flow on NOA	0.96%	8.19%	12.63%
Operating Cash Flow					
12.	OPER_CF/SALES	Operating Cash Flow Margin	5.07%	13.08%	17.27%
13.	OPER_CF/TA	Operating Cash Flow on Assets	5.19%	10.92%	13.36%
14.	OPER_CF/NOA	Operating Cash Flow on NOA	10.70%	19.20%	25.18%
EBITDA					
15.	EBITDA/SALES	EBITDA Margin	8.79%	18.91%	23.34%
16.	EBITDA/TA	EBITDA on Assets	9.35%	15.28%	17.15%
17.	EBITDA/NOA	EBITDA on NOA	18.00%	27.32%	34.50%

Panel A: Median Values of Cash Flow, Earnings and EBITDA Ratios

Panel B: EBITDA Figures per Quarter of ROE, NOPM and Operating Cash Flow (for S&P 500)

Metric split in quarters:	ROE			
	Q1	Q2	Q3	Q4
Median ROE per quartile:	-40.13%	3.42%	13.30%	25.09%

Median NOPM per quartile:	-28.55%	1.63%	5.57%	13.02%
Median EBITDA Metric per quartile				
EBITDA/SALES	-9.14%	5.60%	12.66%	26.28%
EBITDA/TA	-4.89%	9.82%	15.26%	17.08%
EBITDA/NOA	-8.52%	20.00%	26.98%	30.84%
	Operating Cash Flow on Assets			
	Q1	**Q2**	**Q3**	**Q4**
Median Operating CF per quartile:	-11.58%	3.32%	8.38%	15.59%
Median EBITDA Metric per quartile				
EBITDA/SALES	-3.97%	13.13%	18.02%	21.57%
EBITDA/TA	-6.02%	8.30%	12.57%	20.16%
EBITDA/NOA	-6.63%	14.97%	21.66%	37.52%

Panel B: EBITDA Figures per Quarter of ROE, NOPM and Operating Cash Flow (for S&P 500)

Panel C: EBITDA versus others: Which is Higher?

Type	Metric	Total Sample	S&P 500	DOW 30
Percentage of firms for which:				
1.	EBITDA > Net Operating Profit	93%	99%	99%
2.	EBITDA > Gross Profit	13%	14%	3%
3.	EBITDA > Free Cash Flow	70%	87%	89%
4.	EBITDA > Operating Cash Flow	66%	85%	90%

Panel C: EBITDA versus others: Which is Higher?

total sample and the S&P 500 and DOW 30 subsamples. Panel B shows, for the S&P 500 sample, medians of EBITDA for each quartile of return on equity (ROE), net operating profit margin (NOPM) and operating cash flow scaled by total assets. Panel C shows the proportion of firms for which EBITDA is larger than earnings and cash flows, for the total sample and the S&P 500 and DOW 30 subsamples.

Table 2

Descriptive Statistics

Panel A: EBITDA Reporting by Fama-French Industry

Industry	Industry Name	% of firms reporting EBITDA
2	Food Products	12.9%
4	Beer & Liquor	5.2%
5	Tobacco Products	11.4%
6	Recreation	16.9%
7	Entertainment	36.1%
8	Printing and Publishing	19.6%
9	Consumer Goods	11.3%
10	Apparel	6.9%
11	Healthcare	20.0%
12	Medical Equipment	10.5%
13	Pharmaceutical Products	5.0%
14	Chemicals	14.0%
15	Rubber and Plastic Products	15.2%
16	Textiles	38.3%

22	Electrical Equipment	18.4%
23	Automobiles and Trucks	16.7%
24	Aircraft	26.8%
25	Shipbuilding, Railroad Equipment	17.1%
26	Defense	17.3%
27	Precious Metals	16.7%
28	Non-Metallic and Industrial Metal Mining	32.9%
29	Coal	36.4%
30	Petroleum and Natural Gas	12.4%
31	Utilities	5.3%
32	Communication	25.7%
33	Personal Services	22.1%
34	Business Services	17.1%
35	Computer Hardware	4.1%
36	Computer Software	6.9%
37	Electronic Equipment	2.9%
38	Measuring and Control Equipment	12.0%
39	Business Supplies	24.4%
40	Shipping Containers	5.1%
41	Transportation	13.9%
42	Wholesale	13.3%
43	Retail	13.8%

Panel A: EBITDA Reporting by Fama-French Industry

Panel B: Number of firms starting/stopping the disclosure of EBITDA

year	stop	begin
2006	19	25
2007	17	32
2008	25	28
2009	13	65
2010	22	66
2011	21	50
2012	27	64
2013	22	52
2014	40	41
2015	39	61
2016	40	41
average	25.9	47.7

Panel B: Number of firms starting/stopping the disclosure of EBITDA

Descriptive Statistics

Table 3 : Univariate Tests

	Average	Median	Average	Median	*mean differences*	*median differences*
N Obs = 15,895					*p-value*	*p-value*
Market Cap (mln USD)	12,044	2,343	4,923	1,989	*0.000*	*0.000*
Sales (mln USD)	8,381	1,672	4,442	1,675	*0.000*	*0.482*
Assets (mln USD)	23,541	2,885	5,610	2,132	*0.000*	*0.000*
ROA	0.051	0.047	0.042	0.043	*0.000*	*0.000*
Loss firm	0.110	0.000	0.160	0.000	*0.000*	*/*
Drop in earnings	0.275	0.000	0.294	0.000	*0.078*	*0.148*
Market to Book	3.000	2.154	3.060	2.181	*0.494*	*0.184*
Sales Growth	0.085	0.048	0.077	0.049	*0.124*	*0.410*
Capital Intensity	0.231	0.147	0.263	0.191	*0.000*	*0.000*
Intangibles	0.177	0.101	0.269	0.241	*0.000*	*0.000*
Leverage	0.337	0.325	0.444	0.423	*0.000*	*0.000*
Interest Exp	0.023	0.012	0.034	0.018	*0.000*	*0.000*
Tax Rate	0.240	0.316	0.222	0.322	*0.066*	*0.030*
Cycle	0.055	0.151	0.176	0.143	*0.000*	*0.166*
Change in WC	-0.014	-0.009	0.011	0.009	*0.075*	*0.085*
Forecast Miss	0.309	0.000	0.345	0.000	*0.001*	*0.001*
Forecast Error	0.004	0.001	0.005	0.002	*0.000*	*0.000*
Cash	0.147	0.086	0.109	0.067	*0.000*	*0.000*
R & D	0.033	0.000	0.015	0.000	*0.000*	*0.000*
Capex	0.045	0.028	0.047	0.315	*0.130*	*0.000*

Univariate Tests

This table shows mean and median values of firm characteristics for EBITDA-reporting firms and non-EBITDA reporting firms. Annual reports are considered in this table. Differences between means are tested for their significance by means of t-tests (2-sided) of which p-values are provided in column 6. Differences between medians are tested for their significance by means of Wilcoxon Rank Sum tests (2-sided) of which p-values are provided in column 7. All variables are defined in the Appendix.

Table 4

EBITDA Disclosures—Main Analysis

Firm Size	-	-0.145*** (0.021)	-0.164*** (0.023)	-0.173*** (0.027)	-0.170*** (0.027)	-0.145*** (0.030)	-0.03
ROA	-	-0.136 (0.344)	-0.219 (0.359)	-0.078 (0.407)	-0.623 (0.505)	-0.604 (0.553)	-0.12
Leverage	+	0.921*** (0.125)	0.914*** (0.130)	0.641*** (0.159)	0.644*** (0.161)	0.599*** (0.188)	0.12
Market to Book	-		0.006 (0.006)	0.004 (0.008)	0.006 (0.008)	0.005 (0.009)	0.00
Sales Growth	?		0.243** (0.095)	0.119 (0.109)	0.086 (0.108)	0.175 (0.118)	0.03
Capital Intensity	+			0.592* (0.342)	0.588* (0.337)	0.433 (0.375)	0.09
Intan-gibles	+			1.154*** (0.293)	1.199*** (0.292)	1.177*** (0.322)	0.23
Interest Exp	+			2.658** (1.184)	2.559** (1.189)	2.916** (1.381)	0.58
Tax Rate	?			-0.041 (0.039)	-0.036 (0.039)	-0.030 (0.043)	-0.01
Change in WC	+				1.059** (0.453)	0.953* (0.490)	0.19
Forecast Miss	+					0.071* (0.039)	0.01
Forecast Error	+					4.408** (2.106)	0.87
Cash	?	-0.386 (0.267)	-0.789*** (0.270)	0.044 (0.363)	0.176 (0.371)	0.120 (0.401)	0.02
R & D	?	-3.435*** (0.761)	-3.517*** (0.793)	-4.514*** (0.927)	-4.577*** (0.928)	-4.531*** (0.963)	-0.90
Capex	?	0.968 (0.632)	0.101 (0.636)	0.825 (0.783)	1.003 (0.776)	0.648 (0.910)	0.13
Constant	?	-0.513* (0.275)	-0.344 (0.285)	-0.807** (0.315)	-0.824*** (0.314)	-0.848** (0.330)	

Panel A: EBITDA Disclosure in Annual Reports

Year Effects		Included	Included	Included	Included	Included	
Industry		Included	Included	Included	Included	Included	

Firm Size	-	-0.177*** (0.022)	-0.186*** (0.024)	-0.202*** (0.026)	-0.201*** (0.026)	-0.04
ROA	-	-0.796** (0.322)	-1.055*** (0.331)	-0.746** (0.344)	-1.084** (0.452)	-0.24
Leverage	+	0.834*** (0.120)	0.798*** -0.125	0.636*** (0.147)	0.633*** (0.147)	0.14
Market to Book	-		0.006 (0.006)	0.007 (0.006)	0.008 (0.006)	0.00
Sales Growth	?		0.489*** (0.091)	0.300*** (0.092)	0.283*** (0.092)	0.06
Capital Intensity	+			0.769** (0.334)	0.774** (0.333)	0.17
Intangibles	+			1.607*** (0.246)	1.639*** (0.246)	0.36
Interest Exp	+			2.003** (1.015)	1.938* (1.025)	0.43
Tax Rate	?			0.032 (0.036)	0.036 (0.036)	0.01
Change in WC	+				0.626 (0.421)	0.14
Cash	?	0.021 (0.246)	-0.170 (0.253)	0.932*** (0.326)	1.019*** (0.332)	0.23
R & D	?	-3.580*** (0.631)	-4.078*** (0.653)	-4.947*** (0.698)	-5.032*** (0.699)	-1.11
Capex	?	2.030*** (0.576)	1.331** (0.621)	2.279*** (0.647)	2.379*** (0.645)	0.53

Panel B: EBITDA Disclosure in Earnings Announcements

Constant	?	-0.129 (0.230)	-0.052 (0.242)	-0.537* (0.279)	-0.534* (0.280)	
Year Effects		Included	Included	Included	Included	
Industry Effects		Included	Included	Included	Included	
Observations		51,758	46,115	38,460	38,460	
Pseudo R-squared		0.184	0.183	0.203	0.204	

EBITDA Disclosures—Main Analysis

Panel A: EBITDA Disclosure in Annual Reports

Dependent Variable =		Indicator for EBITDA Disclosure in 10-K				
	Predicted Sign	(1)	(2)	(3)	(4)	(5)
EBITDA in Prior Year	+	2.681*** (0.054)	2.626*** (0.057)	2.552*** (0.061)	2.554*** (0.061)	2.571*** (0.065)
Firm Size	-	-0.103*** (0.015)	-0.111*** (0.017)	-0.125*** (0.020)	-0.121*** (0.020)	-0.096*** (0.022)
ROA	-	-0.239 (0.302)	-0.279 (0.329)	0.080 (0.390)	-0.591 (0.439)	-0.530 (0.480)
Leverage	+	0.538*** (0.085)	0.502*** (0.091)	0.398*** (0.113)	0.400*** (0.115)	0.400*** (0.115)
Market to Book	-		0.005 (0.006)	0.003 (0.007)	0.005 (0.007)	0.009 (0.007)
Sales Growth	?		0.131 (0.118)	0.044 (0.135)	0.003 (0.136)	0.017 (0.152)
Capital Intensity	+			0.391 (0.247)	0.397* (0.245)	0.371 (0.261)
Intangibles	+			0.769*** (0.198)	0.828*** (0.198)	0.922*** (0.219)
Interest Exp	+			1.133 (0.841)	1.036 (0.850)	1.740* (0.974)
Tax Rate	?			-0.055 (0.047)	-0.049 (0.046)	-0.058 (0.053)
Change in WC	+				1.265*** (0.472)	1.197** (0.523)
Forecast Miss	+					0.089* (0.051)
Forecast Error	+					3.436 (2.615)
Cash	?	-0.238 (0.184)	-0.498** (0.195)	-0.080 (0.267)	0.081 (0.273)	0.077 (0.293)
R & D	?	-2.012*** (0.496)	-2.112*** (0.521)	-2.637*** (0.598)	-2.730*** (0.595)	-2.617*** (0.613)
Capex	?	0.461 (0.498)	-0.089 (0.521)	0.468 (0.702)	0.674 (0.707)	0.050 (0.804)
Constant	?	-1.211*** (0.211)	-1.113*** (0.219)	-1.317*** (0.243)	-1.346*** (0.242)	-1.502*** (0.267)

Pseudo R-squared		0.571	0.555	0.546	0.547	0.548

Panel B: EBITDA Disclosure in Earnings Announcements

Dependent Variable =		Indicator for EBITDA Disclosure in Earnings Announcements			
	Predicted Sign	(1)	(2)	(3)	(4)
EBITDA in Prior Year	+	2.228*** (0.049)	2.199*** (0.052)	2.113*** (0.056)	2.113*** (0.056)
Firm Size	-	-0.110*** (0.013)	-0.113*** (0.014)	-0.122*** (0.016)	-0.121*** (0.016)
ROA	-	-0.499** (0.196)	-0.644*** (0.202)	-0.470** (0.213)	-0.746*** (0.277)
Leverage	+	0.486*** (0.068)	0.469*** (0.071)	0.393*** (0.085)	0.390*** (0.085)
Market to Book	-		0.001 (0.003)	0.002 (0.004)	0.003 (0.004)
Sales Growth	?		0.306*** (0.054)	0.182*** (0.057)	0.169*** (0.056)
Capital Intensity	+			0.428** (0.198)	0.433** (0.197)
Intangibles	+			0.939*** (0.146)	0.964*** (0.145)
Interest Exp	+			0.993* (0.572)	0.945 (0.576)
Tax Rate	?			0.023 (0.024)	0.026 (0.023)
Change in WC	+				0.502* (0.257)
Cash	?	-0.019 (0.143)	-0.112 (0.149)	0.503** (0.197)	0.573*** (0.199)
R & D	?	-2.150*** (0.389)	-2.452*** (0.403)	-3.001*** (0.433)	-3.070*** (0.433)
Capex	?	1.197*** (0.334)	0.787** (0.359)	1.320*** (0.379)	1.397*** (0.379)
Constant	?	-0.947*** (0.140)	-0.909*** (0.149)	-1.172*** (0.171)	-1.170*** (0.171)

Panel B: EBITDA Disclosure in Earnings Announcements

at least three times "EBITDA" in the current year annual report, and zero otherwise. In Panel B, the dependent variable *EBITDA* is a dummy variable equal to one if a firm discloses "EBITDA" at least once in the current annual or quarterly earnings announcement, and zero otherwise. *EBITDA in Prior Year* is a dummy variable equal to one if a firm has mentioned at least three times "EBITDA" in the report of the previous fiscal year, and zero otherwise (Panel A). *EBITDA in Prior Year* is a dummy variable equal to one if a firm has mentioned at least one time "EBITDA" in the previous earnings announcement, and zero otherwise (Panel B). Annual reports and earnings announcements are extracted from EDGAR. All explanatory variables are measured for the current year. All variables are defined in the Appendix. Standard errors are presented below the coefficients in parentheses and are clustered by firm. *, **, *** denote significance at the 10%, 5% and 1% level (two-sided).

Table 6

Intensity of EBITDA disclosures

Panel A: Intensity of EBITDA Disclosure in Annual Reports

	Predicted Sign	(1)	(2)	(3)	(4)	(5)	(6)
Firm Size	-	-0.338*** (0.005)	-0.412*** (0.006)	-0.411*** (0.006)	-0.377*** (0.007)	0.023 (0.035)	0.010 (0.038)
ROA	-	-0.141 (0.206)	0.248 (0.222)	-0.022 (0.236)	0.133 (0.266)	-0.626 (0.388)	-0.118 (0.621)
Leverage	+	2.002*** (0.064)	1.472*** (0.075)	1.473*** (0.075)	1.419*** (0.086)	0.444*** (0.126)	0.436*** (0.144)
Market to Book	-		0.011** (0.005)	0.012** (0.005)	0.006 (0.006)		0.011 (0.007)
Sales Growth	?		0.146** (0.057)	0.129** (0.058)	0.208*** (0.062)		0.004 (0.123)
Capital Intensity	+		1.128*** (0.100)	1.126*** (0.100)	0.895*** (0.112)		0.750* (0.436)
Intangibles	+		2.452*** (0.092)	2.472*** (0.092)	2.338*** (0.101)		0.116 (0.323)
Interest Exp	+		4.790*** (0.560)	4.736*** (0.560)	5.541*** (0.667)		2.082* (1.284)
Tax Rate	?		-0.047* (0.028)	-0.044 (0.028)	-0.004 (0.032)		-0.060 (0.039)
Change in WC	+			0.540*** (0.132)	0.599*** (0.146)		0.142 (0.675)
Forecast Miss	+				0.093*** (0.035)		
Forecast Error	+				8.387*** (1.064)		
Cash	?	-1.038*** (0.132)	-0.209 (0.144)	-0.140 (0.145)	-0.322** (0.158)	0.607** (0.296)	0.859* (0.509)
R & D	?	-6.596*** (0.283)	-7.506*** (0.303)	-7.530*** (0.303)	-7.536*** (0.326)	-0.075 (1.101)	-0.093 (1.314)
Capex	?	2.761*** (0.331)	2.339*** (0.403)	2.426*** (0.403)	1.759*** (0.445)	0.176 (0.636)	-1.234 (0.846)

Panel A: Intensity of EBITDA Disclosure in Annual Reports

Constant	?	-12.562*** (0.043)	-11.372*** (0.047)	-11.375*** (0.047)	-11.420*** (0.051)	1.909*** (0.322)	1.626*** (0.404)
Year Effects		Included	Included	Included	Included	Included	Included
Industry		Included	Included	Included	Included	Included	Included

Sample =		All Firms			Only EBITDA disclosing Firms	
	Predicted Sign	(1)	(2)	(3)	(4)	(5)
Firm Size	-	-0.555*** (0.067)	-0.589*** (0.073)	-0.585*** (0.074)	-0.168*** (0.049)	-0.160*** (0.051)
ROA	-	-2.573*** (0.985)	-2.240** (0.993)	-3.234** (1.298)	-0.759 (0.613)	-0.635 (0.878)
Leverage	+	2.623*** (0.346)	1.861*** (0.392)	1.852*** (0.392)	0.585*** (0.224)	0.208 (0.243)
Market to Book	-		0.017 (0.016)	0.019 (0.016)		0.005 (0.009)
Sales Growth	?		0.922*** (0.253)	0.873*** (0.251)		0.176 (0.200)
Capital Intensity	+		2.376*** (0.911)	2.377*** (0.910)		0.515 (0.578)
Intangibles	+		4.736*** (0.693)	4.820*** (0.692)		0.919* (0.476)
Interest Exp	+		6.711** (2.697)	6.529** (2.724)		7.622*** (2.030)
Tax Rate	?		0.054 (0.100)	0.064 (0.099)		-0.035 (0.056)
Change in WC	+			1.836 (1.184)		0.115 (0.786)
Cash	?	0.309 (0.753)	3.129*** (0.953)	3.378*** (0.968)	0.568 (0.489)	1.437** (0.640)

Panel B: Intensity of EBITDA Disclosure in Earnings Announcements

R & D	?	-11.718*** (2.017)	-15.248*** (2.080)	-15.488*** (2.082)	0.584 (1.753)	-0.700 (1.828)
Capex	?	6.583*** (1.760)	6.983*** (1.826)	7.278*** (1.826)	2.710** (1.086)	2.020* (1.184)
Constant	?	-12.562*** (0.043)	-11.372*** (0.047)	-11.375*** (0.047)	1.909*** (0.322)	1.626*** (0.404)
Year Effects		Included	Included	Included	Included	Included
Industry Effects		Included	Included	Included	Included	Included
Observations		15,298	10,108	10,106	2,113	1,553
Adjusted R-squared					0.237	0.256

significance at the 10%, 5% and 1% level (two-sided).

Table 7 : Adjusted EBITDA disclosures

		Adjusted EBITDA Disclosures in 10-K				Adjusted EBITDA Disclosures in Earnings Announcements	
Dependent Variable is an Indicator for disclosure of:		«Adjusted EBITDA"	"EBITDAR"	Either "Adjusted EBITDA" or "EBITDAR"	Either "Adjusted EBITDA" or "EBITDAR"	Either "Adjusted EBITDA" or "EBITDAR"	Either "Adjusted EBITDA" or "EBITDAR"
Sample =		All Firms	All Firms	All Firms	Only EBITDA disclosing Firms	All Firms	Only EBITDA disclosing Firms
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)
Firm Size	-	-0.099*** (0.029)	-0.028 (0.038)	-0.103*** (0.028)	-0.107* (0.059)	-0.183*** (0.029)	-0.216*** (0.052)
ROA	-	-1.229*** (0.378)	-1.143** (0.474)	-1.213*** (0.376)	-1.784** (0.850)	-1.602*** (0.355)	-2.082*** (0.689)
Leverage	+	0.570*** (0.152)	0.546*** (0.195)	0.628*** (0.152)	0.287 (0.292)	0.776*** (0.166)	0.610** (0.256)
Market to Book	-	0.005 (0.007)	-0.012 (0.009)	0.002 (0.007)	0.013 (0.013)	0.003 (0.007)	0.004 (0.010)
Sales Growth	?	0.479*** (0.102)	0.531*** (0.120)	0.447*** (0.101)	0.345 (0.248)	0.347*** (0.101)	0.607*** (0.204)
Capital Intensity	+	0.526 (0.385)	0.342 (0.448)	0.742** (0.370)	1.483* (0.769)	0.752** (0.341)	0.399 (0.563)
Intangibles	+	1.021*** (0.271)	0.824*** (0.301)	1.106*** (0.268)	0.340 (0.543)	1.259*** (0.283)	0.459 (0.483)
Interest Exp	+	0.078 (1.211)	-2.143 (1.470)	-0.209 (1.194)	-2.112 (2.216)	1.694 (1.174)	2.413 (2.016)

Adjusted EBITDA disclosures

Table 7 presents probit regression analyses of Adjusted EBITDA disclosures for a sample of S&P1500 firms between 2005 and 2016. In Specifications (1)-(4) show results for Adjusted EBITDA disclosures in annual reports and Specifications (5) and (6) in earnings announcement reports. In Specification (1), the dependent variable is a dummy variable equal to one if a firm has mentioned at least one time "Adjusted EBITDA" in the current year annual report, and zero otherwise. In Specification (2), the dependent variable is a dummy variable equal to one if a firm has mentioned at least one time "EBITDAR" in the current year annual report, and zero otherwise. In Specifications (3) and (4), the dependent variable is a dummy variable equal to one if a firm has mentioned at least one time either "Adjusted EBITDA" or "EBITDAR" in the current year annual report, and zero otherwise. In Specifications (5) and (6), the dependent variable is a dummy variable equal to one if a firm has mentioned at least one time either "Adjusted EBITDA" or "EBITDAR" in the current annual or quarterly earnings announcement, and zero otherwise. Specifications (4) and (6) only include firm observations which have disclosed at least once "EBITDA" in their annual

R & D	?	-1.590** (0.700)	-0.148 (0.766)	-1.494** (0.692)	3.350 (2.318)	-4.564*** (0.766)	3.079 (1.937)
Capex	?	0.693 (0.765)	0.842 (0.999)	0.581 (0.761)	-0.348 (1.616)	2.089*** (0.735)	0.150 (1.122)
Constant	?	-0.962*** (0.316)	-1.937*** (0.417)	-1.003*** (0.312)	-0.455 (0.689)	-1.251*** (0.336)	0.614 (0.630)
Year Effects		Included	Included	Included	Included	Included	Included
Industry Effects		Included	Included	Included	Included	Included	Included
Observations		10,339	10,038	10,500	1,518	38,346	5,761
Pseudo R-squared		0.104	0.115	0.097	0.145	0.236	0.204

Table 8

EBITA and EBIT disclosures

Panel A: EBITA and EBIT Disclosure in Annual Reports

Firm Size	-0.010 (0.036)	-0.060 (0.041)	0.008 (0.028)	0.002 (0.032)
ROA	-1.130** (0.531)	-1.022 (1.127)	-0.246 (0.456)	0.306 (0.753)
Leverage	0.419** (0.174)	0.448* (0.258)	0.427** (0.177)	0.531** (0.237)
Market to Book	-0.004 (0.008)	-0.015 (0.013)	0.006 (0.008)	0.005 (0.011)
Sales Growth	0.679*** (0.122)	0.620*** (0.159)	0.196* (0.108)	0.049 (0.130)
Capital Intensity	-0.128 (0.379)	0.081 (0.834)	-0.344 (0.302)	-0.315 (0.384)
Intangibles	0.611** (0.264)	0.517* (0.373)	0.274 (0.263)	0.099 (0.335)
Interest Exp	-0.277 (1.333)	-0.378 (2.023)	-0.939 (1.401)	-1.314 (2.240)
Tax Rate	-0.062 (0.052)	0.086 (0.130)	0.046 (0.046)	0.158** (0.069)
Change in WC		0.286 (0.730)		0.301 (0.613)
Forecast Miss		0.182*** (0.069)		0.030 (0.046)
Forecast Error		0.590 (3.441)		-2.058 (3.150)
Cash	1.039*** (0.365)	1.365*** (0.406)	0.611* (0.336)	0.537 (0.409)
R & D	0.405 (0.748)	1.276* (0.775)	-0.060 (0.660)	0.330 (0.754)
Capex	0.741 (0.905)	0.699 (1.883)	0.731 (0.742)	0.575 (0.960)
Constant	-1.845*** (0.284)	-2.164*** (0.294)	-1.623*** (0.228)	-1.928*** (0.260)
Year Effects	Included	Included	Included	Included
Observations	10,573	9,038	10,573	9,038
Pseudo R-squared	0.0720	0.130	0.0192	0.0235

Panel A: EBITA and EBIT Disclosure in Annual Reports

Panel B: EBITA and EBIT Disclosure in Earnings Announcements

Firm Size	-0.072 (0.086)	-0.082 (0.094)	0.197** (0.08)	0.222** (0.094)
ROA	-1.262* (0.716)	-1.442 (0.969)	0.427 (0.567)	0.438 (0.753)
Leverage	0.958*** (0.343)	1.090*** (0.370)	0.364 (0.257)	0.421 (0.281)
Market to Book	-0.020 (0.018)	-0.024 (0.021)	0.013 (0.008)	0.013 (0.009)
Sales Growth	0.043 (0.293)	-0.011 (0.311)	-0.581*** (0.174)	-0.594*** (0.180)
Capital Intensity	-0.630 (0.890)	-0.590 (0.922)	-0.459 (0.378)	-0.594 (0.420)
Intangibles	1.120*** (0.421)	1.107** (0.473)	-0.189 (0.333)	-0.183 (0.353)
Interest Exp	-18.141** (9.123)	-17.524* (9.647)	-1.425 (2.430)	-0.766 (2.766)
Tax Rate	0.100 (0.107)	0.092 (0.111)	-0.010 (0.057)	-0.032 (0.056)
Change in WC		0.141 (0.622)		-0.214 (0.719)
Forecast Miss		0.038 (0.117)		-0.070 (0.059)
Forecast Error		-5.299 (3.584)		-1.031 (3.227)
Cash	1.490*** (0.413)	1.627*** (0.397)	-0.753 (0.685)	-0.686 (0.678)
R & D	-0.882 (1.612)	-1.098 (1.685)	-1.358 (0.961)	-1.728* (1.014)
Capex	-2.345 (2.732)	-2.651 (2.981)	-1.053 (1.056)	-1.100 (1.206)
Constant	-2.373*** (0.692)	-2.239*** (0.709)	-2.910*** (0.284)	-2.855*** (0.299)
Year Effects	Included	Included	Included	Included
Observations	38,646	33,659	38,646	33,659
Pseudo R-squared	0.115	0.123	0.055	0.061

Panel B: EBITA and EBIT Disclosure in Earnings Announcements

EBITA and EBIT disclosures

Table 8 presents probit regression analyses of EBITA and EBIT disclosures for a sample of S&P1500 firms between 2005 and 2016. The dependent variable is a dummy variable equal to one if a firm has mentioned at least one time "EBITA" (Specifications (1)-(2)) or "EBIT" (Specifications (3)-(4)) in the current year annual report

EBITDA Disclosures

Panel A: Interdependent Proportions of Disclosures

Proportion of Non—*EBITDA* disclosers which disclose:			Difference (p-value of T-test):
(1)	Adjusted EBITDA	10.85%	
(2)	EBIT or EBITA	7.84%	
Proportion of ***EBITDA*** disclosers which also disclose:			
(3)	Adjusted EBITDA	45.89%	(1) vs (3): **0.000*****
(4)	EBIT or EBITA	6.84%	(2) vs (4): **0.085***
Proportion of **Non—*Adjusted EBITDA*** disclosers which disclose:			
(1)	EBITDA	7.50%	
(2)	EBIT or EBITA	8.46%	
Proportion of ***Adjusted EBITDA*** disclosers which disclose:			
(3)	EBITDA	36.09%	(1) vs (3): **0.000*****
(4)	EBIT or EBITA	3.54%	(2) vs (4): **0.000*****
Proportion of **Non—*EBIT or EBITA*** disclosers which disclose:			
(1)	Adjusted EBITDA	15.66%	
(2)	EBITDA	11.89%	
Proportion of ***EBIT or EBITA*** disclosers which disclose:			
(3)	Adjusted EBITDA	6.87%	(1) vs (3): **0.000*****
(4)	EBITDA	10.43%	(2) vs (4): **0.085***

Panel A: Interdependent Proportions of Disclosures

Sample =		All firms	All firms	Only non-GAAP disclosing Firms	All firms	Only non-GAAP disclosing Firms
	Predicted Sign	(1)	(2)	(3)	(4)	(5)
Firm Size	-	-0.232*** (0.046)	-0.208*** (0.050)	-0.264*** (0.075)	-0.311*** (0.046)	-0.237*** (0.072)
ROA	-	0.073 (0.646)	-0.749 (0.884)	-0.936 (1.083)	-2.502*** (0.777)	-2.979** (1.288)
Leverage	+	1.009*** (0.248)	1.127*** (0.298)	0.773** (0.375)	1.526*** (0.258)	0.814** (0.364)
Market to Book	-	0.017 (0.012)	0.017 (0.014)	0.017 (0.017)	0.020* (0.011)	0.008 (0.015)
Sales Growth	?	0.001 (0.190)	0.055 (0.208)	0.740** (0.295)	0.179 (0.159)	0.095 (0.264)
Capital Intensity	+	0.916* (0.532)	0.783 (0.582)	2.071** (0.890)	1.045** (0.524)	0.389 (0.698)
Intangibles	+	1.914*** (0.464)	2.027*** (0.502)	0.350 (0.745)	2.349*** (0.437)	0.986 (0.672)
Interest Exp	+	4.427** (1.794)	4.473** (2.171)	-2.392 (3.051)	3.507* (1.918)	3.116 (2.337)
Tax Rate	?	-0.047 (0.068)	-0.036 (0.074)	-0.005 (0.082)	0.023 (0.063)	-0.093 (0.085)
Change in WC	+		1.461* (0.759)		1.870*** (0.709)	2.343* (1.213)
Forecast Miss	+		0.024 (0.063)			
Forecast Error	+		5.082* (3.134)			
Cash	?	0.411 (0.584)	0.649 (0.633)	0.006 (0.986)	1.206** (0.611)	1.452 (0.884)
R & D	?	-7.465*** (1.371)	-7.558*** (1.415)	1.330 (2.548)	-9.445*** (1.354)	-1.421 (2.896)
Capex	?	2.126* (1.219)	1.934 (1.384)	-2.765 (2.270)	3.355*** (1.214)	2.163 (1.410)
Year Effects		Included	Included	Included	Included	Included
Industry Effects		Included	Included	Included	Included	Included
Observations		10,573	9,038	2,513	38,643	9,281
Pseudo R-squared		0.119	0.119	0.111	0.174	0.136

Panel B: Ordered Regression Specification

		with EBIT < 0	EBITDA > 0	with EBIT < 0	EBITDA > 0
	Pred. Sign	(1)	(2)	(3)	(4)
EBITDA Loss	-	-0.596*** (0.162)		-0.217* (0.116)	
EBIT Loss	+		0.181 (0.122)		0.172 (0.123)
Firm Size	-	-0.157*** (0.061)	-0.177*** (0.026)	-0.194*** (0.062)	-0.208*** (0.026)
Leverage	+	0.610** (0.281)	0.665*** (0.162)	0.842*** (0.245)	0.647*** (0.149)
Market to Book	-		0.003 (0.008)		0.005 (0.006)
Sales Growth	?		0.086 (0.110)		0.307*** (0.096)
Capital Intensity	+		0.555 (0.350)		0.758** (0.338)
Intangibles	+		1.164*** (0.296)		1.601*** (0.247)
Interest Exp	+		3.119** (1.368)		3.156*** (1.128)
Tax Rate	?		-0.038 (0.039)		0.030 (0.036)
Cash	?		0.106 (0.365)		0.887*** (0.331)
R & D	?		-4.363*** (0.988)		-4.435*** (0.752)
Capex	?		1.041 (0.784)		2.143*** (0.657)
Constant		-0.017 (0.497)	-0.798** (0.316)	0.079 (0.463)	-0.615** (0.285)
Year Effects		Included	Included	Included	Included
Industry Effects		Included	Included	Included	Included
Observations		751	9,929	2,521	37,297
Pseudo R-squared		0.237	0.173	0.236	0.203

Panel C: Interdependencies between EBITDA and EBIT

period, and zero otherwise. In Specifications (1) and (3), only observations with a negative EBIT are considered. In Specifications (2) and (4), only observations with positive EBITDA are considered. Annual reports and earnings announcements are extracted from EDGAR. All explanatory variables are measured for the current year. All variables are defined in the Appendix. Standard errors are presented below the coefficients in parentheses and are clustered by firm. *, **, *** denote significance at the 10%, 5% and 1% level (two-sided).

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