ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics

Master Thesis
Accounting and Auditing

The predictive ability of non-GAAP free cash flow

Nienke de Droog
443220

Supervisor: Dr. Edith Leung
Second assessor: Dr. Michael Erkens

Acknowledgement

I would like to express gratitude to Dr. Edith Leung for guiding me through this thesis process and always providing helpful feedback. I would also like to sincerely thank Dr. Michael Erkens for his feedback and contribution to my thesis.

Abstract

This study examines the informativeness of free cash flow. Using a sample of S&P500 firms, I find that free cash flow and its GAAP counterpart, operating cash flow, are similarly predictive of firm performance. Both current-period cash flow measures are each significantly predictive of firm performance, whether this is measured as future operating cash flow or future earnings. Thus, although not incremental to operating cash flow, firms disclosing free cash flow voluntarily communicate valuable performance information. Over time, the informativeness of free cash flow has increased. This implies that the SEC's Compliance and Disclosure Interpretations are associated with increase in sincere communication through and a decrease in opportunistic use of non-GAAP cash flow measures. I find some evidence that simple free cash flow is less predictive of firm performance than when additional adjustments are made to the measure. Additional tests suggest that standardized free cash flow is more predictive of firm performance when computed with Compustat data than when disclosed by firms directly. My findings suggest that opportunistic incentives tend to outweigh information incentives in simple free cash flow disclosures, so caution should be applied when interpreting this measure as predictor of firm performance.

Keywords: non-GAAP cash flow, free cash flow, firm performance, informativeness

Contents

1 Introduction

This thesis examines the informativeness of non-GAAP free cash flow. I analyse the ability of free cash flow to predict firm performance, measured both as operating cash flow and earnings before extraordinary items. Overall, I am interested in whether firm-disclosed free cash flow is informative. I examine this in comparison to GAAP operating cash flow as well as over time. Further, I analyse two different types of free cash flow disclosed by firms to examine whether one is more predictive of firm performance than the other. Specifically, I analyse simple/standardized free cash flow (computed as operating cash flow minus capital expenditures) and adjusted free cash flow, which contains more and/or different adjustments than the former. I compare both types to a free cash flow measure based on Compustat data.

Over time, disclosures of non-GAAP measures have become more frequent. Nowadays, approximately 97% of S&P500 (Standard and Poor's 500) firms voluntarily disclose at least one non-GAAP measure in filings or other published documents (PwC, 2019). Managerial incentives for these disclosures can generally be divided into two categories: information and opportunism incentives (e.g., Bhattacharya et al., 2003; Bowen et al., 2005; Curtis et al., 2014). Existing literature finds evidence on the presence of both incentives for non-GAAP earnings. For instance, non-GAAP earnings are used strategically to meet-or-beat analysts' forecasts (Bhattacharya et al., 2003). On the other hand, when less information can be communicated through GAAP earnings, firms use non-GAAP earnings for this purpose. The latter are then also found to be more useful by investors (Bhattacharya et al., 2003; Lougee & Marquardt, 2004). Bowen et al. (2005) find evidence that presence of one incentive does not necessarily exclude the presence of the other. Prior research, thus, suggests that the balance of the incentives in the computation of non-GAAP earnings measures, depends on the context and circumstances.

Contrary to literature on earnings, there is little research on other non-GAAP measures, such as cash flows. This is interesting as one of the four most popular non-GAAP measures is free cash flow, according to PwC (2019). Free cash flow has become increasingly popular over time, with both firms and investors (Adame et al., 2018, 2019). To my knowledge, few existing papers focus on free cash flow. Of particular relevance, Adame et al. (2018, 2019) examine the attention paid to it by investors, the incentives relating to the decision to disclose free cash flow and the information content free cash flow contains. However, they focus primarily on information contained in Compustat-based simple free cash flow surprises, incremental to earnings. The authors further only consider firm-disclosed free cash flow values when examining the difference between those values and Compustat simple free cash flow, again only as unexpected information incremental to earnings (Adame et al., 2018, 2019). I build on the research of Adame et al. (2018, 2019) by focussing on firm-disclosed data, instead of primarily using on Compustat-based free cash flow. This thesis extends non-GAAP literature by analysing a measure that has received little attention so far, namely (adjusted) free cash flow.

The incentives faced by managers in their decisions regarding voluntary disclosures create concerns for the U.S. Securities and Exchange Commission (SEC). Especially the possibility for firms to use non-GAAP disclosures opportunistically, has created concerns (Marques, 2006; Bond et al., 2017). The level of concern has varied over time and led to different regulations and guidelines (Marques, 2006; Bond et al., 2017), which are examined in existing literature. For instance, Regulation G of 2003 and the Compliance and Disclosure Interpretations (C&DI's) of 2010 are examined by Bond et al. (2017). They show that Regulation G is associated with an increase in informativeness and value-relevance of non-GAAP earnings (Marques, 2006; Bond et al., 2017). Further, Kolev et al. (2008) show that firms that discontinued their non-GAAP disclosures post-2003, originally made exclusions to GAAP measures that were of lesser quality than those of firms that continued their voluntary disclosures after the implementation of Regulation G. Similarly, the 2010 C&DI's are also associated with an increase in the quality of earnings exclusions. This is likely because the guidelines made it easier to understand the requirements of Regulation G (Deloitte, 2019) and allowed firms to adapt their choices to their improved understanding. However, mixed evidence is found on these C&DI's, since they are also associated with a decrease in market response to non-GAAP earnings and the number of exclusions used to meet-or-beat analysts' forecasts did not change post-2010 (Bond et al., 2017). Thus, it seems that the 2010 C&DI's indeed clarified Regulation G, improving firms' interpretation of what exclusions are allowed and how. But it also appears that the C&DI's simultaneously made it more attractive for others to (re)start disclosing non-GAAP measures, and made it easier to manipulate these disclosures, leading to a decrease in informativeness. This study extends existing literature on SEC rules and regulations by examining the recent C&DI's, issued in 2016. These C&DI's reflect a change in the SEC's approach towards a stricter attitude as well as the continued monitoring of disclosed non-GAAP measures (Deloitte, 2019). By analysing the informativeness of adjusted free cash flow measures pre- and post-2016, this thesis provides relevant information for the SEC and adds new evidence to existing literature on non-GAAP guidelines and regulations.

In this study, I focus on the informativeness of adjusted free cash flow and analyse this in several ways. First, I compare the non-GAAP measure to its most comparable GAAP measure. Unlike research on non-GAAP vs. GAAP earnings, I find no difference in predictive ability of the two measures. I do find that both operating cash flow and adjusted free cash flow are significantly predictive of firm performance, regardless of whether this is measured as operating cash flow or earnings. Since Adame et al. (2019) show that investors are increasingly paying attention to free cash flow, the insignificant difference in GAAP and non-GAAP cash flows does not mean that managers should stop disclosing free cash flow. By disclosing free cash flow, managers are able to ensure that they can communicate performance information to investors, incremental to what they communicate through earnings. Even if investors do not specifically examine operating cash flow, research finds that they are increasingly paying attention to free cash flow (Adame et al., 2019). By disclosing both cash flow measures, firms increase the likelihood that investors receive and react to information contained in cash

flows and firms can communicate more information than contained in earnings (Adame et al., 2018, 2019). So, although free cash flow does not provide more information than operating cash flow, it is highly valuable for firms to disclose this information as they are able to communicate more information with it than with earnings (Adame et al., 2018, 2019). Second, I compare simple and adjusted free cash flow measures with each other, when they are both disclosed directly by firms. The total sample includes nine firm-quarter observations for which both simple and adjusted free cash flow data are disclosed. Dropping these nine observations means that the simple free cash flow observations are now fully distinct from the group containing adjusted free cash flow data. When the two groups are distinct from each other, I find some evidence indicating that observations containing adjusted free cash flow, are more predictive of firm performance than standardized free cash flow. The difference in informativeness of these two measures depends on the chosen outcome variable. These findings extend non-GAAP literature since a comparison of two non-GAAP cash flow measures has not been done yet in this manner. Further research would be valuable to fully analyse the difference in these measures. Finally, I examine the change in ability of adjusted free cash flow in predicting firm performance between 2014 and 2018. I find that in terms of predicting firm performance as same-quarter operating cash flow of the subsequent year, free cash flow's ability has increased over time. The issuance of the C&DI's in 2016 is thus positively associated with the information content of free cash flow, which suggests that the C&DI's achieved the SEC's intended effect to a certain extent. This is valuable information for both investors and regulators. To financial statement users such as investors, it shows that there is a positive trend in predictive ability of free cash flow, meaning that their increased attention to the measure does not seem to be misplaced. For regulators, it suggests that similar to Regulation G, the guidelines are associated with a decrease in opportunism in reporting non-GAAP free cash flow.

Overall, this study provides firms, investors, regulators and others with new insights. The results of this research do not correspond to research on earnings, in that I do not find that the non-GAAP cash flow measure is more informative than the most corresponding GAAP measure. Nevertheless, I find that both are significantly predictive of firm performance and communicate valuable information. These findings expand existing literature on non-GAAP measures, as there has been little research on non-GAAP cash flows so far. Further, the informativeness of non-GAAP adjusted free cash flow has increased over time. This is relevant for regulators as the SEC, since it implies that their 2016 C&DI's are positively associated with the predictive ability of adjusted free cash flow. The finding supports research done by Bond et al. (2017) and corresponds with their findings that both stricter (more flexible) regulations and guidelines increase (decrease) non-GAAP measures' informativeness. Furthermore, my research shows that the C&DI's achieved the SEC's intended goal to a certain extent. Namely, the SEC has concerns on the opportunistic use of non-GAAP measures and an increase in information content post-2016 indicates that the informative (opportunistic) computation of non-GAAP free cash flow increased (decreased). Further, I find that adjusted free cash flow is able to communicate more information than standardized free cash flow, in terms of predicting quarterly

future cash flows. This implies that by making additional adjustments to obtain the measure, firms are able to communicate more information and account for their individual circumstances. This is also implied by an additional analysis, which suggests that simple free cash flow numbers are more informative when computed using Compustat data than when disclosed by firms themselves. I do not find this difference for disclosed adjusted free cash flow and Compustat simple free cash flow. This suggests that managers disclosing simple free cash flow are incentivized more opportunistically and those disclosing adjusted free cash flow face more information incentives. Again, this implies that adjusted free cash flow measures tend to be used to sincerely communicate information. It, also, indicates that apparently firms manage to manipulate their simple free cash flow measure. For instance, by not disclosing the amounts included in capital expenditures, firms have room to manipulate the measure when using it in non-GAAP computations. Nevertheless, I should note that I find that simple free cash flow is informative of firm performance in all analyses, meaning that the measure is still useful for users of financial statements. However, more caution is required when interpreting simple free cash flow data compared to adjusted free cash flow, due to the findings suggesting opportunistic use of simple free cash flow by firms. Furthermore, this analysis has important implications for the SEC. It appears that their concerns should be focused more on firms disclosing simple free cash flow. Particularly, my findings suggest that when adjustments are fully and honestly disclosed, the measure provides a more informative picture of firm performance. This research provides the SEC with a more specific area for it to focus its regulations and guidelines on, which can aid in finding more direct solutions for its concerns.

Nonetheless, this research has its limitations. I find results with valuable implications, specifically for those that already disclose these measures, but I cannot make inferences for firms that do not voluntarily disclose non-GAAP measures. Further, the sample size is relatively small due to time constraints and hand-collection of data. Expanding the sample size both over time and in number of firms included might improve the results. Finally, data discrepancies exist between disclosed and Compustat-based simple free cash flow data. This can be due to opportunistic manipulation by firms and/or due to standardization adjustments made to the data by Compustat. Although opportunistic use of simple free cash flow is indicated by the results of section 6.2 and Compustat data adjustments should impact the comparisons with simple free cash flow and with adjusted free cash flow similarly, further research is required to fully examine the impact of the standardization adjustments done by Compustat.

2 Key literature

This section discusses existing literature on topics relevant for this research. Although extensive research on the value-relevance and predictive ability of cash flows and earnings exists, there is a clear lack of cash flow-oriented research in non-GAAP literature as compared to research on non-GAAP earnings numbers. Specifically, only three existing papers focus on the independent measure of interest to this paper, non-GAAP free cash flows. Two of these three are particularly relevant for this thesis and these two papers by Adame et al. (2018, 2019) form the basis of this thesis. Since another analysis is done to examine the effects of the SEC's Compliance and Disclosure Interpretations issued in 2016, I also discuss prior research on the effects of previously issued SEC regulations and guidelines. Here, the focus lies on papers examining the effects of both Regulation G (into effect in 2003) and the C&DI's issued in 2010.

2.1 Performance measures

Most existing academic research focuses on the value-relevance of earnings, occasionally accompanied with that of cash flows. Mixed evidence exists on the relative and incremental value of earnings and cash flows for returns. Dechow (1994) argues that cash flows suffer from matching and timing problems and that accruals included in earnings mitigate these issues. Following this reasoning, earnings are more value-relevant since they do not suffer from these problems (Dechow, 1994). Another explanation supporting the value-relevance of earnings over cash flows, is the presence of accounting conservatism. Similar to Dechow's (1994) timing problem, conservative accounting policies create circumstances where earnings are found to be more informative than cash flows. Bad news and losses are recognized sooner in earnings, whereas they will only be recognized in statements of cash flows at the occurrence of cash inflow/outflow (Kim & Kross, 2005). Kim and Kross (2005) conclude that that makes earnings timelier and more informative.

On the other hand, others have found results indicating a higher level of informativeness of cash flows than of earnings (e.g., Christian & Jones, 2004; Finger, 1994; Lorek & Willinger, 2009; Nallareddy et al., 2018). Cash flows are found to be more informative than earnings in situations with smaller operating cycles, less working capital accruals (Dechow, 1994; Nallareddy et al., 2018), increasing levels of selling, general and administrative expenses (intangible intensity) (Nallareddy et al., 2018) and in years in which mergers occur (Christian & Jones, 2004). Bowen et al. (1986) find no consistent evidence of either earnings or cash flows as better predictor of future cash flows. The authors use various definitions for cash flows, both traditional and alternative ones. This likely causes the inconsistent findings, as different definitions of cash flows lead to different conclusions. Their *WCFO* variable comes closest to the traditional view of operating cash flow (Bowen et al., 1986; Tuovila, 2020) (CFO) and it is found to be better in predicting future operating cash flows than earnings (Bowen et al., 1986).

As the previous paragraphs suggest, there is mixed evidence on whether earnings of cash flows better summarize firm performance. For instance, Dechow (1994) finds that cash flows' ability to measure firm performance improves with increased measurement intervals, compared to earnings' ability. Finger (1994), however, finds opposite results. Her results show that cash flows have a higher predictive ability on the short term. Over longer measurement intervals, she finds no significant difference between the two measures (Finger, 1994). These opposing results can likely be explained by research design choices, such as the different dependent variables. Dechow (1994) measures firm performance as stock returns, whereas Finger (1994) measures cash flows' and earnings' ability in predicting future cash flows. One underlying cause of the mixed evidence on the informativeness of earnings and cash flows appears to be this choice of dependent variable. Generally, the dependent concept to be measured is firm performance, but its application in models differs. Research using stock returns to measure value-relevance and informativeness tends to find that earnings are more value-relevant than cash flows (e.g., Dechow, 1994; Nichols & Wahlen, 2004)[1]. Papers examining future cash flows mostly find the opposite result, namely that cash flows are more informative and have a higher predictive ability (e.g., Bowen et al., 1986; Christian & Jones, 2004; Finger, 1994; Lorek & Willinger, 2009; Nallareddy et al., 2018). Nevertheless, there are papers using future cash flows as dependent variable that find that earnings have a higher predictive ability than current cash flows (Dechow et al., 1998; Kim & Kross, 2005). Nallareddy et al. (2018) are among the first group of papers examining future cash flows and examine possible explanations for these conflicting findings. They attribute the results favouring earnings mainly to measurement errors that occur when using a balance sheet approach for measurements. The authors state that, by using a more indirect approach of measuring and computing cash flows, these papers wrongly find that earnings are more value-relevant (Nallareddy et al., 2018). Since papers measuring cash flows more directly, such as from the cash flow statement, indeed find results in favour of cash flows compared to earnings (e.g., Bowen et al., 1986; Christian & Jones, 2004; Lorek & Willinger, 2009) and those indirectly measuring cash flows find opposite results (e.g., Dechow et al., 1998; Kim & Kross, 2005), the explanation of Nallareddy et al. (2018) seems supported.

Other causes of mixed evidence could be different samples sizes (small sizes (e.g., Finger, 1994) or possible survivorship bias), different methodologies (time-series vs cross-sectional (e.g., Finger, 1994; Lorek & Willinger, 1996)), different definitions of current period cash flows and earnings (e.g., Bowen et al. (1986) use multiple variable definitions) and complexity of the used models (e.g., Christian and Jones (2004) include no control variables, whereas Lorek and Willinger (2008) do).

[1] Adame et al. (2018, 2019) find the opposite result, in favour of cash flows. However, unlike the majority of discussed literature so far, they examine a non-GAAP measure. They are (one of) the first to examine the market response free cash flows in mine and their knowledge (Adame et al., 2018, 2019). Next to the choice of cash flow variable, the chosen approach might contribute to the different finding, since Adame et al. (2018, 2019) specifically analyse information in free cash flow (surprises) incremental to information in earnings surprises.

Nallareddy et al. (2018), however, refute many of these possible explanations. They state that different sample sizes and compositions, different variable definitions and methodology choices do not affect their results and that the conflicting evidence is mainly attributable due to the choice of balance sheet or cash flow approach (Nallareddy et al., 2018). Nevertheless, it is possible for a combination of these factors to cause the mixed evidence in value-relevance and informativeness literature. Nallareddy et al. (2018) have only tested the effects of each research design aspect separately, whereas other researchers have naturally chosen to use various combinations of these aspects in their analyses. This is a common issue when comparing papers with each other and solving it is not the aim of this research. However, to account for a clear cause of mixed evidence as much as possible, I will follow prior research in taking a direct approach to cash flow measurement.

By using two different measures of free cash flow (one "standardized" and one adjusted, computed at managers' discretion), I examine whether different definitions of free cash flow lead to significantly different results. One of the cash flow definitions used by Nallareddy et al. (2018) is free cash flow, defined as operating cash flow adjusted for capital expenditures and operating expenses, assuming that all of a firm's assets are operating assets. This definition goes slightly beyond what I refer to as standardized or simple free cash flow (SFCF): cash flow from operations minus capital expenditures. With their variable, Nallareddy et al. (2018) find highly similar results as they do for CFO, namely superiority compared to earnings in predictive ability. However, they use different dependent variables when analysing each cash flow measure. Namely, future free cash flow is applied when analysing current free cash flow and future CFO is regressed on current CFO. Although both future free cash flow and future CFO are regressed on earnings and earnings can therefore be compared to both current free cash flow and current operating cash flow separately (Nallareddy et al., 2018), the research does not allow for a clear comparison of the predictive abilities of free cash flow and operating cash flow with each other. I add to this research by using the same dependent variable for both current-period operating and free cash flow, allowing a clear comparison of their predictive ability. Further, I extend existing literature by primarily examining the free cash flow values as actually reported by managers, calculated to their own discretion (FCF)[2]. Nallareddy et al. (2018) do not consider values actually reported by firms themselves and use a calculation of which not realistically can be expected that any financial statement user would execute it themselves to obtain information. FCF values in this thesis are thus computed using different numbers than the free cash flow calculations used by Nallareddy et al. (2018) and the SFCF values used in Adame et al. (2018, 2019) and might lead to

[2] The term 'non-GAAP (adjusted) free cash flow' refers to free cash flow values reported by firms, where adjustments go beyond capital expenses. There are also firms that compute this measure by using a different starting point than operating cash flow. This all falls under non-GAAP (adjusted) FCF. When referring to SFCF, standardized or simple free cash flow, I refer to free cash flows calculated by deducting capital expenses from operating cash flow. This is also a non-GAAP measure, indicating that it is not a financial measure for which clear computational regulations are established by the SEC. The analysed free cash flow measures thus both deviate from GAAP.

different results. That would dispute the claim that different cash flow definitions, ceteris paribus, do not affect results significantly (Nallareddy et al., 2018).

I should note that Adame et al. (2018, 2019) do examine surprises in firm-disclosed adjusted non-GAAP free cash flow in additional analyses. However, like their analysis of SFCF, they only examine information provided incrementally to earnings surprises. Further, the 'disclosed FCF' surprises are computed based on SFCF surprises and differences between disclosed values and values calculated using the SFCF formula (Adame et al., 2018, 2019). They do not provide evidence to support the reasoning that 'disclosed FCF' surprises primarily depend on the trailing-twelve-months results for SFCF. Although they show that adjusted FCF values can be achieved by making adjustments to SFCF, they fail to acknowledge that possible interaction of multiple adjustments can lead to different expectations and twelve-month trends for adjusted FCF values than would be the case for SFCF numbers. I believe that by taking the actual disclosed FCF value, my results will be more accurate and reliable. Furthermore, there has yet to be examined whether they might be valuable in other aspects of firm performance measurement, such as predictive ability of future cash flow streams. My research focuses on examining the ability to predict future cash flows, which provides a different and – to my knowledge – new perspective on the informativeness of the free cash flow measures.

2.2 GAAP vs. non-GAAP performance measures

Although there is evidence on the value-relevance and predictive-abilities of both earnings and cash flows, research on earnings is significantly more present in literature on GAAP and non-GAAP measures than research on cash flows. Some prior research finds that non-GAAP earnings are used strategically (e.g., Brown et al., 2012; Doyle et al., 2013), whereas others find a more sincere information incentive to lie behind non-GAAP disclosures (e.g., Bradshaw & Sloan, 2002; Lougee & Marquardt, 2004). Pointing to an opportunistic incentive, non-GAAP earnings are found to typically be higher than the firm's corresponding GAAP earnings (Marques, 2006). Bhattacharya et al. (2003) find that non-GAAP earnings more frequently result in a profit and more often meet or beat analysts' consensus forecasts. Similarly, if not able to meet analysts' consensus forecasts using GAAP earnings, managers are found to exclude items to get to income-increasing non-GAAP earnings, allowing firms to meet or beat forecasts (Doyle et al., 2013). The SEC has formulated some concerns in this respect, leading them to issue new C&DI's in 2016 (see section 2.3) (Deloitte, 2019).

On the other hand, a large body of evidence supports the finding that managers' non-GAAP earnings are more informative than GAAP earnings (e.g., Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Lougee & Marquardt, 2004). When GAAP earnings are less informative, non-GAAP earnings are both more likely to be disclosed by managers and found to be more useful and informative by investors (Bhattacharya et al., 2003; Lougee & Marquardt, 2004). Moreover, investors looking for summarized performance information typically focus more on non-GAAP earnings measures than on GAAP earnings (Bradshaw et al., 2018). Providing the first evidence

based on large samples (Young, 2014), Bhattacharya et al. (2003) analyse short-window abnormal returns around earnings announcement dates and find that analysts also look positively on non-GAAP earnings, perceiving them as a more permanent profitability measure than GAAP operating earnings. Since Bhattacharya et al. (2003) additionally find that non-GAAP earnings more often meet or beat analysts' consensus forecasts, implying a strategic use of non-GAAP earnings numbers, they find support for both informative and opportunistic use of non-GAAP earnings by managers. Bowen et al. (2005) find corresponding results with evidence supporting both opportunistic and informative reasonings for reporting non-GAAP earnings. They find that when managers perceive their GAAP earnings to be less informative, such as for high-technology firms, they place relatively more emphasis on non-GAAP earnings than on GAAP earnings. However, the performance metric that portrays the best performance, is also most likely to be emphasized more (Bowen et al., 2005). The two incentives are thus not necessarily mutually exclusive.

In contrast to non-GAAP earnings, there are few studies on the relevance of non-GAAP cash flows. My interest specifically lies in adjusted non-GAAP free cash flows. Although some standardized form of free cash flows has developed over time in the form of 'operating cash flow minus capital expenditures', firms generally apply different computations for free cash flows since US GAAP does not provide a definition for the concept. This lack of clear definition creates another concern for the SEC (Marques, 2006). I primarily focus on the free cash flow values as disclosed by firms, calculated to managers' own discretion[2]. This expands the potential sample to include more firms and will be more representative, as there are fewer firms that report free cash flow according to the "standardized"/simple free cash flow measure (Adame et al., 2018, 2019). Further, this measure is also more research relevant for regulators such as the SEC, since concerns may vary more than for a "standardized" free cash flow measure. This is due to managers' computational freedom when disclosing adjusted free cash flow, which might lead to opportunities to manipulate on the one hand and opportunities to fully account for individual circumstances in information communication on the other.

To my knowledge, only three existing papers primarily focus on free cash flow. Two of them are particularly relevant for this thesis, both of which are by Adame et al. (2018, 2019). The third paper, by Sloan (1996), is not suitable as part of the foundation of this thesis. In his paper, Sloan (1996) analyses market data from 1963 to 1993 and finds that the market does not react efficiently to free cash flow, which contradicts the widely existing evidence on stock market efficiency. Adame et al. (2019) use more recent market data and find evidence in line with the market efficiency hypothesis, inconsistent with Sloan (1996). The use of recent data by Adame et al. (2019) allows me to base assumptions and expectations on more relevant and current data than the paper by Sloan (1996). Further, the findings of Sloan (1996) were, and still are, inconsistent with a large body of existing evidence and caution should be applied when interpreting his results, as acknowledged by the author himself. Regardless of whether the results are questionable or market reaction to free cash flow indeed used to be inefficient, Adame et al. (2018, 2019) show that the current market reaction is efficient. Since I also

use recent data in this research, the findings by Adame et al. (2018, 2019) are far more relevant and important for this study. Therefore, I will not use Sloan (1996)'s findings in my research but acknowledge that his paper on free cash flow exists.

Both papers by Adame et al. (2018, 2019) demonstrate the increasing attention paid to cash flows. Adame et al. (2018) examine whether free cash flow disclosures provide the market with incremental information beyond earnings surprises. They demonstrate that during their sample period (2004-2016), the number of S&P 1500 firms voluntarily reporting free cash flows in their earnings announcements has increased from less than 10% to over 20%. Assuming that managers are to some extent incentivized to disclose free cash flows to provide information to investors (Black et al., 2018), the increase in disclosures could be explained by the finding that surprises in simple free cash flow values offer incremental information to unexpected earnings (Adame et al., 2019). The market reflects this as it responds incrementally to SFCF and FCF surprises (Adame et al., 2018). When there is an earnings surprise as well as an unexpected level of free cash flows, there is apparently an additional level of unexpected information and investors incrementally incorporate that in their reaction. Investors' responsiveness to these surprises has increased over time, which could reflect their confidence and belief that managers are incentivized to provide information through the non-GAAP measures (Adame et al., 2019). There is evidence supporting the presence of an increasing importance of free cash flows for all firms, but interestingly, changing economic circumstances appear to have a greater impact on the observed increase in market response. Newer firms with high levels of intangible assets have the highest observed levels of free cash flow coefficients, representing market response to free cash flow surprises (Adame et al., 2019). I will specifically consider these findings by both controlling for firm age and for a firm's level of intangibles.

Adame et al. (2018, 2019) only provide a comparison of the informativeness of free cash flow (surprises) and earnings surprises, although they do recognize the requirement of the SEC for firms to reconcile non-GAAP metrics with the most comparable GAAP performance metrics (Adame et al., 2018). To my knowledge, there is no research that compares non-GAAP free cash flow with its most comparable GAAP measure, namely cash from operations. This thesis makes this comparison and builds upon existing literature as provided by Adame et al. (2018, 2019), by extending the GAAP and non-GAAP literature on cash flows. By using more recent data, I am able to reflect recent changes in the SEC's attitude towards non-GAAP measures, whereas Adame et al.'s (2018, 2019) sample period does not allow them to do so. The change in the SEC's attitude only became apparent primarily in the final year of their sample period (2016). I further provide a more relevant comparison for free cash flows as free cash flow and earnings are in composition quite different measures; operating cash flow and free cash flow are in that sense more comparable. By also making a comparison between the predictive abilities of adjusted non-GAAP free cash flow and standardized free cash flow, I provide new and more reliable evidence on the predictive ability of each.

2.3 SEC Compliance & Disclosure Interpretations

Various papers examine the effects of prior SEC regulations and guidelines, such as Regulation G and the C&DI's issued in 2010. This literature allows me to form an understanding of possible consequences of future SEC issuances.

In 2001, the SEC issued a warning regarding firms' use of non-GAAP financial measures. It was meant to both caution firms in the use of and alert investors when interpreting this type of information (Marques, 2006). Two years later, the SEC implemented Regulation G, which affected firms' non-GAAP disclosures. The regulation created a requirement for firms disclosing non-GAAP measures, to present the most comparable GAAP measure at least as prominently alongside the non-GAAP value. It further required firms to present a reconciliation of both measures (Marques, 2006). Prior research finds that the implemented regulation affects both investors and firms. Namely, Regulation G is associated with an initial decline in non-GAAP earnings disclosures. When it went into effect in 2003, the probability of managers making these disclosures declined. Furthermore, in years directly after the implementation, the number of firms reporting non-GAAP performance measures decreased (Bond et al., 2017; Heflin & Hsu, 2008; Marques, 2006). In response to these results, Kolev et al. (2008) examine the quality of firms' non-GAAP earnings exclusions for those continuing and discontinuing non-GAAP earnings disclosures after the SEC interventions. They find that for firms discontinuing the disclosure of non-GAAP earnings numbers, the quality of exclusions is lower in the pre-intervention period than for firms that continued their non-GAAP earnings disclosures post-intervention (Kolev et al., 2008). Regulation G is also associated with a positive market reaction. In the period directly after implementation, abnormal stock returns are observed to be higher for firms reporting non-GAAP earnings than for firms that do not disclose these measures. This statistically significant difference is not observed during periods prior to Regulation G. The difference in abnormal returns could either mean that the market focuses more on non-GAAP earnings post-2003 and interprets them as a sincere attempt to decrease information asymmetry, or that "good" firms simply disclose non-GAAP earnings more frequently (Marques, 2006). Regardless of which causal relation reflects the underlying mechanism, combining the findings of Kolev et al. (2008) and Marques (2006) shows that during the time period directly after Regulation G, the SEC to some extent achieved its desired effect of decreasing the presence of opportunistic voluntary reporting. This points to the existence of at least some strategic incentives for managers to make voluntary disclosures. Other potential consequences of Regulation G can also have influenced the change in likelihood to report. An example is possible discontinuation of non-GAAP disclosures by firms that would originally have used non-GAAP disclosures to sincerely inform investors, due to increased administrative burden posed by Regulation G (Bond et al., 2017; Heflin & Hsu, 2008). It can thus not be clearly concluded to what extent Regulation G fulfilled the SEC's desired effect. It is, however, clear that the regulation affected firms' disclosure policies.

Recently, the number of firms reporting non-GAAP information has increased again (Adame et al., 2018; Bentley et al., 2018; Black et al., 2018). From 2009 to 2014, non-GAAP disclosures of firms in the S&P 500 increased from 53% to 71% respectively. This increase does not seem to be driven by a few specific industries but appears to be present across various industries, from energy to health care to financials (Black et al., 2018). A possible explanation for this renewed increase is the SEC's 2010 C&DI's, signalling the beginning of a more flexible attitude towards requirements on non-GAAP reporting (Bond et al., 2017). These guidelines decreased the administrative burden created by Regulation G and gave firms more flexibility in reporting non-GAAP measures (Bond et al., 2017; Deloitte, 2019). For instance, firms wanting to use measures that exclude recurring items are required to demonstrate the measure's usefulness by Regulation G. The 2010 C&DI's eliminate this demonstration burden and provided firms with flexibility in adjusting for recurring items (Bond et al., 2017). Guidelines such as these could have made it more attractive for firms to (re)start disclosing non-GAAP measures.

In 2016, the SEC issued new Compliance & Disclosure Interpretations, aimed to address questions on how Regulation G applies to financial reporting. The C&DI's issued in 2010 were perceived as loosening the SEC's requirements as formulated in Regulation G. The 2016 interpretation guidelines however, are more restrictive and aimed at solving the SEC's concerns regarding the increased use of non-GAAP disclosures and potential to mislead investors. Before the updated C&DI's, there was no formal guidance on how to interpret the requirement regarding the presentation of non-GAAP and comparable GAAP metrics (Deloitte, 2019). The new C&DI's thus clarify the interpretation of Regulation G for affected firms. Although it is a guideline, it affects firms by indirectly implying regulations for firms to adhere to. The effects of the 2016 C&DI's have not been examined extensively, since the interpretations were only issued recently. Specifically, the effects on the informativeness of non-GAAP free cash flows have not been examined yet. This thesis adds valuable new information by examining these effects. Like the previously issued regulation and guidelines, it is important to examine the consequences of the 2016 C&DI's for both the SEC and for affected firms.

3 Hypothesis development

Literature on managers' incentives for non-GAAP disclosures indicates multiple incentives for voluntary disclosure (Healy & Palepu, 2001). Managers can use voluntary disclosures to reduce information asymmetry through reduction of the lemons problem, which refers to investors valuing all firms at an average level because they do not have enough information to differ between "good" and "bad" firms (Healy & Palepu, 2001). Excluding special-items from GAAP earnings can aid managers in communicating more permanent earnings to investors and give them a better picture of firm performance (Heflin & Hsu, 2008). This information incentive thus leads to positive consequences of voluntary disclosures. On the other hand, firms can use non-GAAP strategically, creating the SEC's mentioned concerns. To increase compensation, managers might be incentivized to strategically disclose information to maximize their stock-based compensation. Aboody and Kasznik (2000) for instance, find evidence supporting this notion for CEOs with fixed award schedules, allowing them to anticipate the moment when they are awarded stock options and thus planning their voluntary disclosures. These firms delay disclosures containing good news and accelerate those reporting bad news, so that the stock prices only react to good news after managers have received stock compensation (Aboody & Kasznik, 2000). Management incentive literature provides evidence for both the informativeness and opportunism arguments (e.g., Healy & Palepu, 2001; Miller, 2009), so no definitive conclusion can yet be drawn on the underlying motives for voluntary disclosures, such as non-GAAP disclosures.

Nevertheless, disclosed non-GAAP metrics must be accurate and credible for the market to be able to rely on them. If disclosures are made strategically, they would likely not be perceived as credible. Non-GAAP earnings are more likely to be used strategically when firms are not able to meet or beat analysts' forecasts using GAAP earnings and when managers are not able to or it is too costly to use other forms of earnings management (Doyle et a., 2013; Black et al., 2017). On the other hand, other literature on non-GAAP earnings finds that non-GAAP performance metrics generally provide a true view of firm performance (e.g., Young, 2014; Black et al., 2018; Leung & Veenman, 2018). The non-GAAP measures are found to be more informative than comparable GAAP performance measures (e.g., Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Lougee & Marquardt, 2004). These findings point to the presence of both discussed voluntary disclosure incentives. It appears that one does not exclude the other (Bowen et al., 2005).

For cash flows, there is little evidence on which to base expectations. The existing evidence shows that managers are increasingly disclosing free cash flow information in their announcements (Adame et al., 2018, 2019). Further, Adame et al. (2019) show that investors are paying more attention to these values. The findings of Adame et al. (2018, 2019) as discussed here and in section 2.2, indicate a stronger average presence of the informativeness incentive than of the incentive to use non-GAAP free cash flow numbers strategically. This leads to an expectation in favour of the predictive ability of non-GAAP FCF over GAAP CFO.

One could also argue that non-GAAP cash flows are less informative than GAAP cash flows. Both free cash flow and earnings are related to operating cash flows through adjustments in the form of capital expenses, accruals or otherwise, such as through adjustments for sale property, plant and equipment (Adame et al., 2018). Since free cash flow is typically calculated by moving away from operating cash flow, it could be said that it thereby is an indirect move towards earnings. As discussed previously, recent research indicates a higher predictive ability for GAAP cash flows (typically CFO) than earnings. Moving towards earnings would then be a move towards less informative information. Following this argument, non-GAAP free cash flows could be found to be less informative than GAAP operating cash flow.

As it is not possible to form a clear expectation based on the previous discussion, I formulate the first hypothesis in null form.

H1: There is no difference in the predictive ability of the adjusted non-GAAP free cash flow metric and the corresponding GAAP cash from operations.

Secondly, I compare the non-GAAP adjusted free cash flow measure with standardized/simple free cash flow. The arguments used in the discussion for Hypothesis 1 may also be relevant here. Adjusted free cash flow contains adjustments beyond those of the standardized free cash flow measure, when reconciling it to its most comparable GAAP measure, operating cash flow (as per SEC requirements). Thus, one could argue that adjusted free cash flow is further away from operating cash flow than standardized free cash flow and thereby closer to earnings. Following this reasoning, standardized free cash flow numbers would likely be more predictive of firm performance. On the other hand, it could be argued that the different approach used in computing adjusted free cash flow reflects managers' information incentive and their intent to provide interested parties with (additional) private information. Additional adjustments and different computational starting points may then reflect managers' intent to account for their specific circumstances. This line of reasoning is supported by prior research, contrary to the first argument. Namely, the market recognizes additional information contained in adjusted free cash flow beyond that of standardized free cash flow (Adame et al., 2018). Adame et al. (2018) show that, when analysing the difference in adjusted and simple free cash flow surprises, the market reacts incrementally to information provided by the difference in FCF and SFCF surprises. Since existing evidence implies that adjusted free cash flow is recognized as more informative by the market than standardized free cash flow and that the market reacts efficiently to information contained in free cash flow (Adame et al., 2018, 2019), I expect that adjusted non-GAAP free cash flow is more informative than simple free cash flow when predicting firm performance.

H2: The adjusted non-GAAP free cash flow measure has a higher predictive ability than the simple free cash flow measure.

The third hypothesis is based on prior research demonstrating the effects of SEC regulations on non-GAAP metrics. The C&DI's can be seen as having similar effects as a regulation, although they are only guidelines. As Deloitte (2017) discusses, the aim is to clarify Regulation G and its consequences for financial reporting. If they are understood sufficiently, the guidelines should lead to a better understanding of Regulation G. Firms should then be able to apply the regulation better after 2016. I, thus, expect the guidelines to be perceived similarly as the regulation and have similar consequences.

Regulation G represents the stricter attitude of the SEC towards the use of non-GAAP measures and is associated with an increase in the informativeness of earnings for firms reporting non-GAAP earnings (Bond et al., 2017). The regulation is further associated with a decrease of differences between disclosed GAAP and non-GAAP earnings values as well as a decrease of that managers' opportunistic use of non-GAAP earnings to meat-or-beat analysts' consensus forecast (Heflin & Hsu, 2008). The switch then from a stricter to a more flexible attitude towards non-GAAP reporting with the C&DI's in 2010, shows a decrease again in earnings' informativeness (Bond et al., 2017). In 2016, the SEC issued new CD&I's, the effects of which have not yet been examined. The 2016 C&DI's represent a turn back to a stricter SEC attitude, reflecting its concerns on firms' strategic use of non-GAAP measures. Since a similar situation with Regulation G is associated with an increase in informativeness, I expect a comparable trend post-2016. Based on the previous discussion as well as key literature, I predict firms' non-GAAP metric to increase in predictive ability after 2016.

H3: The predictive ability of adjusted non-GAAP free cash flow metrics increases after the SEC issued new C&DI's in 2016, compared to the period before these new guidelines.

4 Methodology

This chapter discusses the method used and steps followed in this thesis. First, I will discuss the sample selection procedures followed, leading to 151 unique firms and 934 distinct observations. The predictor variables well as the included controls used in the analyses are discussed next. Finally, I will descriptively analyse the variables. Summary statistics are shown per free cash flow type, for the full sample and for firms excluded from my final sample. The latter group consists of observations of firms listed on Standard and Poor's 500 list at 31 December 2018, but for which firms have not disclosed free cash flow data.

4.1 Sample selection procedures

To construct my sample, I start with all firms listed on Standard and Poor's 500 (S&P500) list at 31 December 2018. I choose a specific date to obtain the constituents as the composition of the index changes frequently: even within the month of December 2018, 6 firms were excluded from/newly added to the list. Constituents are obtained from Compustat using the company code 'i0003', which refers to S&P500 firms. These firms are economically important due to their size (Marques, 2006), making them suitable for economic and financial analysis. Further, the proportion of S&P500 firms reporting at least one non-GAAP measure has increased over time from 59% in 1996 to 71% in 2014 and then to 97% in 2018 (Black et al., 2018; PwC, 2019). This illustrates the increasing popularity of non-GAAP disclosures amongst these firms and makes it likely that this sample will provide sufficient data. As the PwC publication (2019) indicates, there are still also firms that do not voluntarily disclose non-GAAP measures. Further, three of the four most common non-GAAP measures focus on earnings (PwC, 2019), so there will likely be a smaller proportion than 97% of S&P500 firms that specifically report free cash flow values. The S&P500 therefore provides me with sufficient data for free cash flow analyses and allows me to descriptively analyse firms that do not disclose non-GAAP free cash flow values.

For the collection of free cash flow data, I analyse 8-K press releases on fiscal quarters falling in the calendar years 2014 and 2018. I choose 2014 to avoid any potential effects of firms anticipating the 2016 C&DI's since firms might have anticipated the new guidelines and the SEC's stricter attitude in the year prior to the issuance. Choosing 2018 allows for full processing of the new guidelines. Firms might not have directly implemented the C&DI's in their reports and by taking 2018 instead of 2017, I account for this possibility.

I first use the SEC EDGAR database to obtain an overview of all filings in 2014 and 2018. Per year, I then filter out all 8-K filings done by the 500 sample firms. As organizations might change in composition or change their name over time, some firms have different CIK codes and/or different names in 2014 and 2018. 2018 filings of all 500 sample firms could be found, which provides me with 7204 8-K filings of that year. Some firms changed substantively in composition between 2014 and 2018 due to events such as mergers and acquisitions. For example, listed on S&P500 in 2018 is Conagra Brands, which did not exist yet in 2014. Instead, Conagra Foods existed in 2014 but this is now a

subsidiary of Conagra Brands. Since Conagra Brands is the firm listed on the S&P 500 at 31 December 2018, that is the firm of interest. Taking it's (now) subsidiary and the corresponding 2014 data would not be representative of the firm Conagra Brands as a whole. For 2014, I therefore do not include filings of Conagra Foods in the final observations. I make the same decision for other firms that have similarly changed significantly. I am left with 7080 filings for 2014.

These filings are downloaded using a Perl code that was constructed by Leung and Veenman (2018)[3]. The downloaded filings are then run through a second Perl code, also constructed by Leung & Veenman (2018), that allows me to check all documents for keywords related to the term 'free cash flow'. I adapt the codes to suit my own analyses and an overview of all keywords used as input can be found in Table 1. A keyword analysis indicates that 1482 and 1871 filings in 2014 and 2018 respectively potentially contain free cash flow data. I analyse these filings and their press releases manually to collect free cash flow values. Press releases marked in the keyword analysis but only containing the keyword 'FCF' appear to never be of interest, since in this situation, the keyword only appears in the text as webpage programming code. Dropping filings only containing 'FCF' and none of the other keywords of interest, leaves 516 and 649 filings of potential interest for 2014 and 2018. Of this set, 333 and 447 press releases contain quarterly free cash flow values. Since this process focuses on filings done in 2014 and 2018, filings and corresponding press releases relating to the final quarters of both years are not yet included. I collect data from press releases filed with 8-K forms in early 2015 and early 2019 to obtain financial data for the fourth calendar quarters of 2014 and 2018. This data is collected directly from the SEC EDGAR database instead of through the steps described previously, as this is more time efficient for these specific calendar quarters. This leaves me with 425 firm-quarter observations for 2014 and 554 observations for 2018.

I then collect the remaining variables from Compustat for all S&P500 firms included in the index on 31 December 2018 and merge these datasets with the free cash flow data. As appears from the remaining number of firm-quarter observations containing free cash flow data, not all S&P500 firms in 2014 and 2018 have disclosed these values. Removing firms that do not disclose free cash flow numbers as well as firms for which Compustat has insufficient data available on other required variables, drops 385 and 356 firms in 2014 and 2018. This corresponds to five and six additional press releases removed from the original 425 and 554 respectively. Via Compustat, it appears that three more firms have merged and thereby changed their composition but have not yet been removed from the sample. These mergers all occurred during 2019, meaning that the post-merger data on future cash flows from operations is not suitable. I remove the nine observations for which this is the case from the 2018 dataset.

Finally, following prior literature (e.g., Kim & Kross, 2005; Marques, 2006; Leung & Veenman, 2018), I then remove firms in the financial industry with the General Industry Classification

[3] The Perl codes created by Leung and Veenman (2018) can be found via: https://sites.google.com/site/dveenman/ The following link leads to the adapted versions of these codes, which have been used in this research: http://tiny.cc/Perlcodes

Standard (GICS) code 40[4]. This industry classification is removed from the sample due to the differing nature and composition of its regulations (Marques, 2006). The final sample now consists of 107 firms for 2014 and 136 firms for 2018, along with 411 and 523 firm-quarter observations respectively. Overall, 151 unique firms provide data for 934 firm-quarter observations. All firm-quarters included in the final sample disclose free cash flow measures, either standardized (SFCF) or adjusted (FCF), so that I am able to compare the predictive ability of GAAP and non-GAAP measures for firms that choose to voluntarily disclose this additional financial information. Table 2 describes the discussed sample collection steps.

4.2 Variable description

Variables are collected either from Compustat or manually. I manually collect both adjusted non-GAAP free cash flow and simple free cash flow data, following the steps described in the previous section. *NGFCF*, adjusted non-GAAP free cash flow, is based on firms' press releases and I have 507 observations of this variable. As the definition of this variable indicates, it is computed to managers' own discretion and goes beyond the adjustments made to obtain SFCF. The different computational adjustments made by the sample firms are reported in Table 3. If firms report multiple adjusted free cash flow numbers, I choose to only include the one for which the most adjustments are made. I do this because the other adjusted measures tend to be reported as steps in obtaining the most adjusted value, implying that the latter is the end goal that should be focused on. If both standardized and adjusted free cash flow measures are reported, I include both. SFCF values are also obtained manually but I can additionally compute them through Compustat using *OANCFY* and *CAPXY*. These variables represent cash from operations and capital expenditures and are both reported in a year-to-date format. I calculate quarterly values based on the change in value between quarters *t-1* and *t* within a fiscal year. Of the 436 disclosed SFCF observations as reported by firms in their 8-K press releases, a total of 237 observations do not match the value found using Compustat. Values computed via Compustat are on average slightly lower than disclosed SFCF values. I choose to use the SFCF values reported by organizations themselves (*dSFCF*) in my hypothesis test, since this allows me to make a clear comparison on the informativeness of both free cash flow types. Further, there might be problems with the data from Compustat. For instance, firms sometimes include more than just purchases of fixed assets into their capital expenditures. Expenditures as capitalized software costs are not always reported separately (Adame et al., 2018). Hand collection allows me to clearly distinguish fixed asset purchases from other items potentially included into capital expenditures by firms, whereas it is not easily clear which components are included in CAPXY. Nevertheless, Compustat has a 45% accuracy rate for my sample.

[4] Although the utilities industry is only minimally present in the observations and is less commonly excluded than the financial industry, there are papers (e.g., Marques, 2006) that do so due to the more stringent nature of regulations for utilities firms. I therefore do robustness tests excluding this industry (GICS = 55) for all analyses. Untabulated analyses show that excluding the industry does not significantly impact the results.

Furthermore, it is important to consider simple free cash flow values computed through Compustat, as these are calculations that investors and other researchers could execute easily themselves. I therefore later perform additional analyses using standardized free cash flow numbers computed via Compustat (*cSFCF*) to compare their predictive ability to the firm-disclosed numbers. For the main analysis, I have 436 observations of *dSFCF*, existing only of reported values.

The dependent variables, *FUTCFOSUM* and *FUTCFO4*, measure future cash flows from operations. For each observation, *FUTCFO4* takes on the quarterly operating cash flow value of four calendar quarters later. *FUTCFOSUM* represents a yearly future cash flow, computed as the sum of future operating cash flows of the next four calendar quarters (*t+1* to *t+4*). Each fiscal quarter is linked to a calendar quarter, so that variables can be computed in the same manner for all firms, based on the same calendar quarters. By examining both future cash flows one calendar year (*FUTCFOSUM1*) and four quarters later (*FUTCFO4*), I can examine the predictive ability of the current period cash flow variables in two ways.

To control for confounding effects and characteristics that might be related to the dependent and independent variables, I control for the following variables in the analyses. Following Lougee and Marquardt (2004), firm size is controlled for using the natural logarithm of total assets (*LSIZE*). Larger firms have a higher frequency of voluntary disclosures, depending on earnings informativeness (Lougee & Marquardt, 2004) and Adame et al. (2018) show that a correlation exists between total assets and the choice in adjustments made to obtain disclosed free cash flow values. Firm size as *ln(ATQ)* is, for example, related to the decision to adjust for the sale of fixed assets and whether a different starting point than operating cash flow is used in the computation of free cash flow (Adame et al., 2018). For similar reasons, I control for firm age and book-to-market ratio as well. *AGE* is computed as the difference between the year of observation (2014 or 2018) and the first year in which a firm reports non-zero total assets in Compustat. *BTM* is a ratio of the book value of equity to the market value of equity, based on Compustat's *CEQQ* (total common/ordinary equity), *PRCC* (share price) and *CSHOQ* (common shares outstanding). Dummy variables are added for year-quarter fixed effects to account for both year and quarter fixed effects simultaneously. I choose to control for quarter fixed effects because prior research (Dhaliwal et al., 2004) suggests that the voluntary disclosure incentives managers face differ in interim versus fourth quarters. Further, analyses by Bradshaw and Sloan (2002) show that the disparity between GAAP and non-GAAP earnings is greater in the fourth quarter than in other quarters. Both findings indicate a higher presence of opportunistic incentives over information incentives in the fourth quarter as well as a likely different balance of the two in other quarters. It is thus possible that the predictive ability of free cash flow measures differs in the fourth versus other quarters. To ensure I account for other possible systematic differences in year-quarters, I control for each year-quarter instead of solely for the fourth calendar quarter.

Next, I control for firms' intangible and capital intensity. One of the two components of SFCF is capital expenditures, which is related to purchases and lease-related costs of fixed assets. Similarly,

FCF includes capital expenditures in 88.36% of the 507 observations. However, not all firms necessarily require large amounts of fixed assets, which influences their capital expenditures and impacts their free cash flow values. For instance, prior research (e.g., Collins et al, 1997; Francis & Schipper, 1999) demonstrates that high-technology firms tend to have less informative and distorted earnings due to their large investments in research and development and other intangibles. Moreover, Adame et al. (2019) show that there is a significant difference in the information content of SFCF values for firms with low and high levels of intangibles. Information content of SFCF values is especially strong for younger firms with high levels of intangibles (Adame et al., 2019). To account for this when examining predictive ability over time, I control for both age and intangibles. Further, intangibles are not included in capital expenditures, so FCF might also be affected by the level of intangibles a firm invests in through additional adjustments. Therefore, I, include *INTAN* to represent intangible intensity as the level as intangible assets scaled by total assets. Similarly, capital intensity (*LCAPINT*) is included as the natural logarithm of net property, plant and equipment scaled by total assets. For capital intensive firms, expenditure adjustments in free cash flow are shown to be more important than for firms with lower levels of *LCAPINT* (Adame et al., 2018). The relation between free cash flow measures and future operating cash flows for high versus low *LCAPINT* firms might then be impacted by the relevance of one of (S)FCF's (potential) components, capital expenditures. For both firm size and capital intensity, I apply logarithmic transformation to the variables due to high skewness levels. Finally, sales growth is added as the difference between sales of quarters *t* and *t*-4 (the same quarter a year prior), scaled by total assets. Sales and changes in sales impact cash flows and it might thus affect the ability of current period cash flows to predict future cash flows. A list of all variable definitions is shown in Table 4.

4.3 Descriptive statistics

Table 5 displays the descriptive statistics of this sample. For both firm size and capital intensity, the regular variables are shown for interpretational purposes. Further, all continuous variables are winsorized at the 1st and 99th percentiles. As Panel A indicates, current period operating cash flow are on average higher for firms disclosing standardized free cash flow values than for firms that apply different and additional adjustments to their free cash flow measures. *dSFCF* firms are also larger than their *NGFCF* counterparts on average, although the small difference in medians leads to the opposite conclusion. All other quantiles match the conclusion the mean indicates. *dSFCF* firms appear to be slightly older than *NGFCF* firms, both in terms of mean and median. There are nine year-quarter observations for which firms have reported both standardized and adjusted free cash flow measures. In these observations, SFCF is reported as an in between step in firms free cash flow calculations, after which additional adjustments are made to obtain non-GAAP adjusted free cash flow. Untabulated

analyses show that removing these nine observations does not impact the implications of the descriptive statistics significantly[5].

For both groups in Panel A of Table 5, the industrial and IT industries are the most present. This is also apparent from Panel B, where descriptive statistics on the full sample are shown. *CAPINT* is 0.22 on average for all observations, meaning that on average approximately 22% of a firm's total assets exist of net PPE. This value is higher for *NGFCF* observations (0.26), whereas for observations containing simple free cash flows, the value is actually below the total average (0.17). Capital-intensity is thus higher for firms reporting *NGFCF* than for those disclosing *dSFCF*. It seems that firms with larger net PPE investments, feel the need to make more and/or different adjustments to obtain a non-GAAP free cash flow measure than only deducting capital expenditures from their operating cash flow. It could be the case that these capital-intensive firms deem it necessary to make additional adjustments to either operating cash flow and capital expenditures to increase free cash flow. The impact of their capital expenditures on free cash flow measures is likely larger than of their *dSFCF* counter parts, since PPE investments create capital expenditures.

Panel C of Table 5 shows the summary statistics of these observations on a year-by-year basis. Of the 411 observations for 2014, 54 unique firms provide me with 192 simple free cash flow observations and 228 firm-quarters contain adjusted free cash flow values from 63 distinct firms. In 2018, this is 244 and 279 for 68 and 77 unique firms, respectively. The ratios of disclosures to unique firms have stayed relatively the same over time. For adjusted free cash flow disclosures, the ratios of disclosures to firms are 3.623 and 3.619 for 2018 and 2014. Similarly, I observe an increase from 192 to 244 *dSFCF* observations for 54 and 68 unique firms respectively, but the ratio of observations to firms stays comparable at 3.556 and 3.588 for 2014 and 2018. My sample size thus increases because more S&P500 firms initiate free cash flow disclosures and not due to an increased frequency of disclosures per firm. This corresponds to the publication by PwC (2019), which shows that there is a general increasing time-trend in the number of S&P500 firms disclosing non-GAAP measures.

Capital intensity has not changed noticeably over time, but intangible intensity has slightly increased. This can most likely be explained by the increasing popularity and presence of technology and (information) technology firms. Firm size, operating cash flow and both future operating cash flow variables have all increased over time on average as well. Sales growth and the year-quarter dummy variables stayed at relatively similar levels, indicating that apparently there has been no significant change in quarterly sales growth (difference in sales of quarter *t-4* and *t*) nor in the number of free cash flow disclosures per quarter. Reported simple free cash flow values have increased marginally between the two years, with a difference on the average of 5.48% and a difference in medians of 0.30%. On the other hand, Compustat based SFCF (*cSFCF*) increased with 33.26% between 2014 and 2018. This is

[5] The implications of the coefficient test on *dSFCF* and *NGFCF* are changed for the regression models using operating cash flows of the same-quarter the subsequent year. This will be discussed in Chapter 5. Removing the nine observations does not impact any other findings, including those of the additional analyses.

faster than both variables it is based on. Both *CFOQ* and *CAPEXQ* increased significantly at the mean at similar levels, 31.75% and 32.79%, respectively. Since cash flow from operations did not increase faster than capital expenditures on average, it is likely that the balance between *CFOQ* and *CAPEXQ* in the composition of *cSFCF* changed for individual firms, which then impacted the average values of *cSFCF*. Regardless of the computation, total disclosed free cash flow values (*DISCL*) increased over time as well, with 11.43% on average and a 43.50% increase in median values. This appears to be driven by the increase in non-GAAP adjusted free cash flow, which increased by 35.62% at the mean. This is interesting since it could mean that the SEC's new C&DI's have indeed clarified Regulation G for organizations and thereby lowered the (administrative) difficulty of reporting non-GAAP values, although that consequence is not necessarily seen as its purpose. However, I cannot conclude this based on descriptive statistics and additional analysis is necessary to be able to make statistical inferences.

4.4 Descriptive statistics S&P500 firms excluded from sample

Since the final sample included 151 unique firms, not all S&P500 firms are included in this sample. 349 of these 500 firms do not disclose any free cash flow measure in either sample year. There are also firms that only disclose free cash flow measures in certain quarters or only in one of the two years. They then do not provide free cash flow observations for all eight year-quarters. This is the case for 12 firms, which means that there are 361 unique firms with 2560[6] distinct observations included in this group. As Adame et al. (2018, 2019) and others (e.g., Leung & Veenman, 2018) have indicated, serious endogeneity concerns might exist when doing research on voluntary disclosures. I, therefore, include the descriptive statistics on the 2560 firm-quarter observations here, to examine whether there are clear differences between this group and my final sample. I expect this to be the case as prior literature has shown that the decision to disclose non-GAAP measures is not random (e.g., Lougee & Marquardt, 2004; Adame et al., 2018; Leung & Veenman, 2018).

The control group is larger in size on average, but its current-period operating cash flows and capital expenditures are, on average, lower. Accordingly, SFCF values computed using these measures (*cSFCF*) are lower for the control group than for my final sample at all quartiles as well as at the mean. *CAPINT* has a slightly higher mean for the control group compared to the final sample, whereas intangible intensity is noticeably lower. This is consistent with prior findings that earnings of high-technology firms, with high levels of intangible assets, are less informative (e.g., Collins et al., 1997) and that the market's response to free cash flow news is concentrated in firms with high levels of intangibles, particularly new firms (Adame et al., 2019). From the descriptive analysis in Table 5 and Table 6, it appears that intangible-intense firms are more inclined to voluntarily disclose non-GAAP measures, free cash flow in particular. This could for instance be to account for investments in

[6] This number is obtained after removing observations with data problems, due to lack of information in Compustat. 1356 observations fall in 2014 and there are 1204 observations for 2018.

intangibles, if managers feel that they are not accurately represented in GAAP measures. Further, compared to both Panels A and B of Table 5, the industries are not equally present. In the final sample, the industrial and IT industries are most present. In the non-discloser group, the consumer discretionary and health care industries are the most accounted for, with 16% and 14% of the observations coming from these industries on average.

A comparison by year shows similar statistics. Again, operating cash flow and capital expenditures are lower for the control group in both years, whereas average size is higher for this group for 2014 and 2018. The increase in cash flow from operations is less for the non-discloser group than for the main sample. Whereas capital expenditures increased over time for my final sample, the expenditures actually decreased slightly on average for the control group. Similar to the main sample, capital intensity has not changed over time, whereas intangible intensity increased slightly. Nevertheless, in both years, *INTAN* is lower for the control group than the main sample. Overall, there are clear differences between both groups. This means that the main sample is not representative for firms that do not disclose free cash flow measures and that endogeneity concerns are present. Although I have controlled for confounding effects as much as possible, the decision to disclose financial information voluntarily is still associated with endogeneity. Taking this section's observations into account, I cannot make conclusions on whether it would be relevant for firms to initiate voluntary free cash flow disclosures if they are not yet doing so, but my analyses and conclusions will be relevant for (investors interested in) firms with existing free cash flow disclosures. Furthermore, the hypotheses of this research are formulated as comparisons with FCF, either between two measures or over time, instead of being focused on the informativeness of FCF on average. This makes the conclusions that will be drawn internally valid.

5 Research design and results

In this chapter, I will perform analyses using the variables discussed in the previous chapter. Three main equations are formulated and used to test my hypotheses and make inferences. I, first, analyse the difference in predictive abilities of non-GAAP adjusted free cash flow and GAAP operating cash flow. I then compare both non-GAAP measures in their informativeness and finally analyse the information content of adjusted FCF over time. The results of the analyses done in this chapter are shown in Table 7 and 8.

5.1 H1: non-GAAP adjusted free cash flow and GAAP operating cash flow

To examine the predictive ability of GAAP and non-GAAP cash flow measures, I analyse their ability in predicting firm performance. Specifically, I do this for firms that report non-GAAP adjusted free cash flow numbers. Unlike Nallareddy et al. (2018), I use the same dependent variable for all regression models to ensure comparability, namely future operating cash flows. This study uses a commonly applied regression model (e.g., Bhattacharya et al., 2003; Lougee & Marquardt, 2004; Marques, 2006), namely Ordinary Least Squares. Following the commonly applied treatment for outliers in accounting literature (e.g., Lougee & Marquardt, 2004; Heflin & Hsu, 2008; Leung & Veenman, 2018), I winsorize all continuous variables at the 1st and 99th percentiles after analysing the variables, to reduce the effect of outliers on the results. I further account for clustering by year-quarter and firm levels in the regression models, ensuring that standard errors and *t*-statistics are robust. Clustering accounts for the possibility that observations are dependent within groups, while being independent across groups (Stata, n.d.). Since I am working with (unbalanced) panel data, it can be expected that observations within groups, such as observations from the same firm, are correlated. I thus account for this in my regression analyses. Furthermore, heteroscedasticity is present in some of the regressions. Clustering also accounts for this and makes the standard errors and *t*-statistics robust for the presence of heteroscedasticity (Stata, n.d.). After these steps, I deem it appropriate to use the following regression models to test my first hypothesis:

$$FUTCFO4_{iq}\ or\ FUTCFOSUM_{iq} = CFOQ_{iq} + LSIZE_{iq} + INTAN_{iq} + LCAPINT_{iq} + AGE_{iq} + SALESGR_{iq} + BTM_{iq} + YQDV_{iq} + IDV_i + \varepsilon_{iq} \quad (1)$$

$$FUTCFO4_{iq}\ or\ FUTCFOSUM_{iq} = NGFCF_{iq} + LSIZE_{iq} + INTAN_{iq} + LCAPINT_{iq} + AGE_{iq} + SALESGR_{iq} + BTM_{iq} + YQDV_{iq} + IDV_i + \varepsilon_{iq} \quad (2)$$

The results of equations (1) and (2) are presented in Table 7. Panel A uses *FUTCFO4* as dependent variable, whereas in Panel B results of regressions using the sum of future operating cash flows over the next four quarters as dependent variable, are shown. Since I compare the cash flow measures for firm-quarter observations for which FCF values have actually been disclosed, I have 507 observations for both models. In Panel A, the overall model of Equation (1) has a better fit (adjusted-

R^2 = 0.8565) than the model using *NGFCF* (adjusted-R^2 = 0.7259). The coefficient on *CFOQ* in model (1) appears to be slightly lower than the regression coefficient on *NGFCF* in model (2), but a coefficient test indicates that this difference is not statistically significant (coefficients are 0.86 and 0.914, respectively). This suggests that in terms of predicting same-quarter cash flows of the subsequent year, there is no significant difference in the informativeness of the two cash flow measures.

In Panel B, the adjusted-R^2 of model (1) decreases to 0.7944 and the *FUTCFOSUM* model using *NGFCF* also has a slightly lower adjusted-R^2 (0.7155) than the quarterly future cash flow model, with a difference of 1.04 percentage points. In the regressions of future operating cash flows of the same quarter the next year on the independent variables, both predictor variables are associated with changes in *FUTCFO4* of less than the actual change in independent variable. That is to say, a $1 change in either *CFOQ* or *NGFCF* is associated with a less than $1 increase in *FUTCFO4*, specifically $0.86 and $0.91 respectively. When examining yearly future cash flows, the coefficient on *CFOQ* changes to 2.33 (*t*-statistic = 12.99, *p*-value < 0.001) and *NGFCF* now has a regression coefficient of 2.36 (*t*-statistic = 5.86, *p*-value < 0.001). The changes in regression coefficients are significant for both models (model (1): χ^2-statistic = 24.42, *p*-value < 0.001; model (2): χ^2-statistic = 17.41, *p*-value < 0.001), implying significantly different associations with *FUTCFO4* than with *FUTCFOSUM*. This is a logical observation, since current-period cash flow likely predicts performance for all four calendar quarters individually and the aggregated effect is reflected in the coefficients in Panel B. When examining the associations of *CFOQ* and *NGFCF* with yearly future cash flows as sum of the next four quarters, the difference in coefficients (2.331 and 2.364 respectively) is insignificant, implying that operating cash flow and adjusted free cash flow are similarly predictive of yearly future operating cash flows.

Both current-period operating cash flows and adjusted free cash flows are thus positively associated with the quarterly and yearly future cash flow variables. When comparing the predictor variables with each other, I find no significant difference in their predictive abilities, regardless of the time period used for future cash flows. This is consistent with Hypothesis 1, which is formulated in the null form. Based on the arguments discussed in Chapter 3, I was not able to form a hypothesis in the alternative form. On the one hand, existing literature finds non-GAAP measures to be more informative than their corresponding GAAP measures. On the other hand, I argued that non-GAAP free cash flows could also be less informative than GAAP operating cash flows. Like earnings, non-GAAP free cash flows (whether standardized or adjusted) are mostly computed by making adjustments to cash flows from operations. Since both are achieved by moving away from GAAP (operating) cash flows and earnings have recently been found to be less predictive than cash flows, similar findings could result for free cash flow. It seems that both arguments have counteracted each other and thereby lead to insignificant differences in predictive ability.

It should be noted a strong correlation between *CFOQ* and both *FUTCFO4* and *FUTCFOSUM* can be expected due to the similarity in definitions of these variables. This is also observed in Table 11, which displays the pair-wise Pearson coefficients of correlation. To ensure this does not influence the

results in Table 7 significantly, I will do a robustness test in Chapter 6 using future earnings before extraordinary items as outcome variable.

5.2 H2: The predictive ability of FCF versus SFCF

For the second hypothesis, I expect that adjusted free cash flow values are more informative than standardized values. For this purpose, I use Equation (2) as formulated in section 5.1 and formulate Equation (3) as following:

$$FUTCFO4_{iq}\ or\ FUTCFOSUM_{iq} = dSFCF_{iq} + LSIZE_{iq} + INTAN_{iq} + LCAPINT_{iq} + AGE_{iq} + SALESGR_{iq} + BTM_{iq} + YQDV_{iq} + IDV_i + \varepsilon_{iq} \quad (3)$$

In both Panel A and Panel B of Table 7, the third column displays the results of Equation (3). Equation (2) is shown in the second column, as has also been discussed in the previous section. In column (2), I have 507 observations of adjusted free cash flow data. I use 436 observations with simple free cash flow data for Equation (3), shown in column (3). These two groups are thus separate samples, but nine included observations overlap and contain both simple and adjusted free cash flow data.

Using a quarterly perspective, I find a significant relation between *dSFCF* and *FUTCFO4* with a regression coefficient of 0.615 (*t*-statistic = 4.86, *p*-value < 0.001). The model has an explanatory power of 0.7188, meaning that it is able to explain 71.88% of the variance in *FUTCFO4*. Model (2) has a slightly higher power, namely 0.7259. The coefficient on *NGFCF* (0.914; *t*-statistic = 9.48, *p*-value < 0.001) also appears to be higher than that of *dSFCF*. A coefficient test suggests that the difference in coefficients is marginally significant (*p*-value = 0.053). Dropping the nine observations that include both disclosed free cash flow measures changes the results. Now, the difference in *NGFCF* and *dSFCF* is significant (*p*-value < 0.05) for Panel A. The coefficient on *dSFCF* decreases to 0.602 (*t*-statistic = 11.02, *p*-value < 0.001), whereas *NGFCF* sees an increase to 0.941 (*t*-statistic = 18.49, *p*-value < 0.001). Simple free cash flows are now 36.03% less informative than adjusted free cash flows. This suggests that, as long as the groups do not overlap, there is a moderate difference in the ability of the two free cash flow groups to predict same-quarter operating cash flows of the subsequent year.

Replacing the outcome variable with the sum of operating cash flow over the subsequent four quarters, the coefficients of both predictor variables remain highly significant. A $1 change in *NGFCF* is now associated with a $2.36 change in *FUTCFOSUM* (*p*-value < 0.001) and this association is $2.08 (*p*-value < 0.001) for standardized free cash flows. Testing this difference in coefficients suggests that it is insignificant (χ^2-statistic = 0.27, *p*-value > 0.1), meaning that I no longer find a statistically significant difference in the informativeness of the predictor variables[7]. Since I find a significant

[7] As noted in Chapter 4, removing the 9 overlapping observations only changes the results for the analysis of models (2) and (3) of Table 7 Panel A. Dropping these observations does not change any other results and findings, including those of Chapter 5, which is why I do not discuss it for the other analyses.

difference in the coefficients shown in Panel A, regressions using the sum of four-quarter future operating cash flows leads to different findings than the models using the quarterly future cash flows of one calendar year later. Comparing the non-GAAP variables to each other suggests a finding that is partially consistent with my hypothesis. Namely, there is a difference in the predictive abilities of adjusted and standardized free cash flow measure using a quarterly orientation, but not when yearly future cash flows are examined.

The aforementioned concern regarding the similarity in the definitions of *CFOQ*, *FUTCFO4* and *FUTCFOSUM* is also relevant here. Since standardized free cash flows are by definition computed using operating cash flow, *dSFCF* is indirectly affected by the similarity issue. Further, although not all computations of *NGFCF* use cash flows from operations as starting point, most do and adjusted free cash flow is often reconciled to GAAP operating cash flows. To account for the possibility of the similarity issue affecting either free cash flow variable as well, I include these models in the robustness tests.

5.3 H3: The effect of the C&DI's on the predictive ability of FCF

For my third and final hypothesis, I analyse the change in informativeness of adjusted free cash flow values over time. I use Equation (2) for this analysis, first with the 228 *NGFCF* observations of 2014 and then for the 279 firm-quarter observations of 2018. The results are displayed in Table 8.

In both 2014 and 2018, *NGFCF* has a significant, positive association with *FUTCFO4*. The results for 2014 are displayed in model (4). The *NGFCF* coefficient here is highly significant with a value of 0.635 (*t*-statistic = 2.28, *p*-value < 0.001). Similar to the previous analyses, this coefficient can be interpreted as the associated change in *FUTCFO4* for a $1 change in *NGFCF*. The adjusted-R^2 for the 2018 model in Panel A is noticeably higher than that of the model using 2014 observations (0.7797 and 0.6543 respectively). This suggests that the 2018 model is able to explain considerably more variation in *FUTCFO4* than the 2014 regression model. Correspondingly, the coefficient on *NGFCF* in Panel A for 2018 is 1.065 (*t*-statistic = 8.74, *p*-value < 0.001), which is 67.72% more predictive than the coefficient on the same variable in 2014 (0.635; *t*-statistic = 6.49, *p*-value < 0.001). A coefficient test suggest that the difference is highly significant (χ^2-statistic = 7.87, *p*-value < 0.01).

Moving from quarterly to yearly future cash flows, the explanatory power of model (4) increases to 0.7340, whereas the explanatory power of the 2018 model decreases to 0.7480. Although there is a difference of 12.54 percentage points in adjusted-R^2 values in Panel A, the models are now quite similar in their explanatory power. A second coefficient test for Hypothesis 3 implies that the difference in *NGFCF* coefficients of models (4) and (5) in Panel B is now insignificant (χ^2-statistic = 2.70, *p*-value > 0.1). Comparing this to the first coefficient test of Panel A models (4) and (5), the findings suggest that the ability of adjusted free cash flows to predict next-year quarterly cash flows has increased over time, whereas its ability to predict yearly cash flows as sum of the next four quarters has not changed significantly. Thus, in 2014, the non-GAAP adjusted free cash flow measure is

significantly less informative than it is in 2018, in terms of predicting quarterly operating cash flows of the same quarter of the next year. An explanation for this observation is that the implementation of the 2016 C&DI's indeed (partially) achieved the SEC's objective. Namely, by clarifying Regulation G's requirements for non-GAAP disclosures and by intensifying the scrutiny placed on these voluntary disclosures, the C&DI's can incentivize firms to increase the information content contained in these measures. This corresponds with the observed increase in the predictive ability of *NGFCF* from pre-16 to post-16, which is consistent with the evidence on earnings' informativeness after Regulation G and the C&DI's of 2010.

6 Additional analyses

Following up on the main analyses of Chapter 5, I do two additional tests. First, I examine the impact of the choice of dependent variable on my results. Specifically, I test whether my results for Hypothesis 1 and 2 change when I use earnings before extraordinary items as performance measure. Second, I analyse the informativeness of standardized free cash flow when computed using Compustat data. I compare this to firm-disclosed free cash flow observations.

6.1 Similarity issues with the definitions of cash flow variables

Current-period cash flow from operations is measured using Compustat's year-to-date variable *OANCFY*. Using *OANCFY*, I compute quarterly cash flows, which form the variable *CFOQ*. Both *FUTCFO4* and *FUTCFOSUM* exist of the same quarterly operating cash flows, but then of cash flows of future periods. This means that *CFOQ*, *FUTCFO4* and *FUTCFOSUM* are all computed using the year-to-date operating cash flow variable from Compustat and are highly similar in their definitions. Additionally, *cSFCF* is calculated using *CFOQ* and *dSFCF* is based on firms' reported GAAP operating cash flows, meaning that these variables indirectly face the same issue. To ensure that the similarity in definitions does not influence the results in Chapter 5 significantly, I conduct robustness tests where I replace future operating cash flows with earnings before extraordinary items. *IB4* is comparable to *FUTCFO4* in that both variables represent earnings/cash flows of the same quarter the next year. *FUTCFOSUM* and *IBSUM* are also similar, they each refer to the sum of cash flows and earnings of the next four quarters, respectively. Reformulating the equations leads to the following formulas:

$$IB4_{iq}\ or\ IBSUM_{iq} = CFOQ_{iq} + LSIZE_{iq} + INTAN_{iq} + LCAPINT_{iq} + AGE_{iq} + SALESGR_{iq} + BTM_{iq} + YQDV_{iq} + IDV_i + \varepsilon_{iq} \quad (4)$$

$$IB4_{iq}\ or\ IBSUM_{iq} = NGFCF_{iq} + LSIZE_{iq} + INTAN_{iq} + LCAPINT_{iq} + AGE_{iq} + SALESGR_{iq} + BTM_{iq} + YQDV_{iq} + IDV_i + \varepsilon_{iq} \quad (5)$$

$$IB4_{iq}\ or\ IBSUM_{iq} = dSFCF_{iq} + LSIZE_{iq} + INTAN_{iq} + LCAPINT_{iq} + AGE_{iq} + SALESGR_{iq} + BTM_{iq} + YQDV_{iq} + IDV_i + \varepsilon_{iq} \quad (6)$$

Table 9 shows the results of these analyses. For my first hypothesis, I compare the predictive abilities of operating cash flow (*CFOQ*) and non-GAAP adjusted free cash flow (*NGFCF*). The models change considerably when using earnings before extraordinary items as dependent variable compared to when future operating cash flows are used. Along with decreases in the fit of the models, all predictor coefficients decrease noticeably.

Similar to Table 7, Panel A of Table 9 displays the regression results using future earnings of four quarters ahead as outcome variable. Here, the regression coefficient on *CFOQ* is 0.252 (*t*-statistic = 4.65, *p*-value < 0.001) for model (6) and for *NGFCF*, the coefficient is 0.307 (*t*-statistic = 4.45, *p*-value < 0.001). Applying a coefficient test to these variables suggest that the difference is not

statistically significant (χ^2-statistic = 1.87, *p*-value > 0.1). So, although both variables have highly significant coefficients and are each able to predict future firm performance as quarterly earnings, they do not statistically differ in their abilities to do so. In Panel B, again similar to the previous tables, the results are shown using the four-quarter sum of future earnings as dependent variable. The coefficients of both variables are higher than in Panel A, with values of 1.102 (*t*-statistic = 6.39, *p*-value < 0.001) and 1.299 (*t*-statistic = 5.54, *p*-value < 0.001) for *CFOQ* and *NGFCF*, respectively. Testing the difference in coefficients suggests that this is still not significant. Thus, for both quarterly and yearly future earnings, I do not find that GAAP operating cash flow and non-GAAP adjusted free cash flow are statistically different from each in other in their predictive abilities. This finding is consistent with Hypothesis 1, which is formulated in the null form.

Comparing the findings to section 5.1, the predictive ability of each variable changes when switching the dependent variable from future operating cash flow to future earnings. I find that both operating cash flow and adjusted free cash flow are significantly less predictive of firm performance when this is measured as future earnings than when it is measured as future operating cash flow. Overall though, the results of Table 7 and Table 9 lead to the same inferences, indicating that the choice of outcome variable does not affect the implications. Both tables suggest that the non-GAAP cash flow measure does not differ significantly from its most comparable GAAP cash flow measure in informativeness. These results are consistent with my first hypothesis, regardless of whether future firm performance is measured as earnings or operating cash flow.

Model (8), using *dSFCF*, leads to similar results and inferences as models (6) and (7), using *CFOQ* and *NGFCF* as predictor variables. For both Panel A and Panel B in Table 9, the regression coefficients on *dSFCF* are significantly different from those in Table 7 (A: χ^2-statistic = 14.17, *p*-value < 0.001; B: χ^2-statistic = 14.97, *p*-value < 0.001). Disclosed standardized free cash flow values are significantly less predictive of future earnings than of future operating cash flow. To test Hypothesis 2 again, I perform coefficient tests on *NGFCF* and *dSFCF*. Using quarterly future earnings, the predictor coefficient for *dSFCF* is 0.217 (*t*-statistic = 4.81, *p*-value < 0.001), whereas this is 0.307 for *NGFCF* (*t*-statistic = 4.45, *p*-value < 0.001). Testing this difference suggests that it is insignificant, indicating that the simple and adjusted free cash flow measures do not differ significantly in their ability to predict firm performance as same-quarter earnings of the subsequent calendar year. Similarly, I find that the predictor coefficients of models (7) and (8) in Panel B also do not differ significantly (1.299 and 0.86 respectively) . This leads to the conclusion that the two non-GAAP cash flow measures do not differ in their ability to predict future quarterly and yearly earnings.

These findings only partially correspond to those of section 5.2. Consistent with this section, I find that *NGFCF* and *dSFCF* do not differ in their ability to predict yearly operating cash flow/earnings. However, for the quarterly future firm performance measures, the results of Table 7 and Table 9 differ. Using quarterly earnings, I find an insignificant difference in the informativeness of the two predictor variables. This is not consistent with section 5.2, as for *FUTCFO4*, I find a significant difference in the

predictive abilities of *NGFCF* and *dSFCF*. These results suggest that simple and adjusted free cash flow measures differ in their ability to predict quarterly operating cash flow, but do not differ significantly in their ability to predict earnings.

Overall, the above coefficient tests largely correspond with the results of sections 5.1 and 5.2. The difference in predictive ability of GAAP operating cash flow and non-GAAP adjusted free cash flow remains insignificant for firms that voluntarily disclose this non-GAAP measure, regardless of the chosen performance measure. This is consistent with Hypothesis 1. I do not find a significant difference in the informativeness of the two non-GAAP free cash flow measures in Table 9 Panel B, which corresponds to the findings of the main analyses. But using a quarterly orientation, the earnings results differ from section 5.2. I now do not find a significant difference in predictive ability, whereas the analysis in 5.2 shows a moderately significant difference between *dSFCF* and *NGFCF*. So, although the results of Panel B are consistent with Chapter 5 and inconsistent with Hypothesis 2, the latter finding leads the opposite inference. In predicting same-quarter next year items, it depends on the chosen performance measure whether adjusted free cash flows are more predictive than simple free cash flows or not.

6.2 Compustat standardized/simple free cash flows

In section 5.2, I compare observations of firms disclosing adjusted free cash flow numbers with firm observations containing standardized free cash flow values. Researchers and users of financial statements, such as investors, do not only have to rely on free cash flow measures disclosed by firms, but can also compute these measures themselves. Specifically, standardized free cash flow numbers can easily be computed through databases as Compustat. This database is widely used by researchers, but has also faced its criticism. For instance, existing literature has shown that some discrepancies exist between Compustat data and firm-disclosed data (e.g., Chychyla & Kogan, 2015). A primary cause of these differences is the standardization of data by Compustat, meaning that the database adjusts values to their standardized format. This might lead to different values for *dSFCF* and *cSFCF* for the same firm-quarter and different summary statistics for my data. Thus, it is not likely that *dSFCF* and *cSFCF* lead to the same regression results, though theoretically their computations should be the same. Although an ongoing discussion exists on the implications of these data differences, computations with Compustat data are still commonly used in research. They can be done relatively easily by anyone with access. Therefore, it remains valuable to investigate whether these numbers are informative. In particular, I examine how firm-disclosed free cash flow values compare to Compustat based simple free cash flow numbers. I regress all four dependent variables on *cSFCF* to allow for a full comparison. This leads to the following equations:

$$FUTCFO4_{iq}\ or\ FUTCFOSUM_{iq} = cSFCF_{iq} + LSIZE_{iq} + INTAN_{iq} + LCAPINT_{iq} + AGE_{iq} + SALESGR_{iq} + BTM_{iq} + YQDV_{iq} + IDV_i + \varepsilon_{iq} \quad (7)$$

$$IB4_{iq}\ or\ IBSUM_{iq} = cSFCF_{iq} + LSIZE_{iq} + INTAN_{iq} + LCAPINT_{iq} + AGE_{iq} + SALESGR_{iq} + BTM_{iq} + YQDV_{iq} + IDV_i + \varepsilon_{iq} \quad (8)$$

I regress each equation twice per dependent variable. Models (9) and (10) each use *FUTCFO4* and *FUTCFOSUM* as dependent variables. The first model uses the 507 observations for which adjusted free cash flow values are disclosed and model (10) includes only observations containing disclosed standardized free cash flow values, which are 436 observations. This is the same for models (11) and (12), which use *IB4* and *IBSUM*.

For all four models in both panels, the coefficient on *cSFCF* is highly significant. Comparing models (2) and (9), coefficient tests suggest that standardized free cash flow values calculated using Compustat data are not significantly more or less informative than the adjusted free cash flow numbers that firms themselves disclose, regardless of which dependent cash flow variable is used. Both models are based on the same 507 observations, which allows for a more reliable comparison than if the full sample was used to compute *cSFCF*. I make similar observations for models (7) and (11), which regress both *IB4* and *IBSUM* on *NGFCF* and on *cSFCF*. Again, coefficient tests suggest insignificant differences in the predictive abilities of *NGFCF* and *cSFCF* for both quarterly earnings as well as the sum of earnings over the subsequent four calendar quarters.

Next, I examine the predictive abilities of the disclosed and calculated standardized free cash flow measures. Unlike the comparison of *NGFCF* and *cSFCF*, coefficient tests now suggest significant differences in the informativeness of the variables. In predicting same-quarter next year operating cash flows, disclosed standardized free cash flow numbers are 47.44% less informative than when computed using Compustat data. For the four-quarter sum of future operating cash flows, *dSFCF* is 39.46% less predictive than *cSFCF*. Both differences are highly significant (A: χ^2-statistic = 19.02, *p*-value < 0.001; B: χ^2-statistic = 15.48, *p*-value < 0.001). For models (8) and (12), I make similar observations. Again, *dSFCF* is less predictive than *cSFCF* of earnings of the same quarter of the subsequent year as well as of the sum of earnings over the subsequent four quarters. A $1 change in *cSFCF* is associated with an approximate $0.35 change in *IB4* and a $1.54 change in *IBSUM*, whereas these associations are just $0.22 and $0.86 for *dSFCF*, respectively. The differences in predictor coefficients for models (8) and (12) are statistically significant for both panels (A: χ^2-statistic = 4.78, *p*-value < 0.05; B: χ^2-statistic = 21.45, *p*-value < 0.001).

Overall, these findings suggest that there is no significant difference in the informativeness of non-GAAP adjusted free cash flows and Compustat based standardized free cash flows for firms that choose to disclose the former measure. This is interesting as Adame et al. (2018) find that (the surprise in) firm disclosed adjusted free cash flow offers incremental information to Compustat simple free cash

flow and earnings surprises. This difference in findings is likely mainly because I examine the measures themselves, as they are disclosed, whereas Adame et al. (2018) analyse the difference in the actually disclosed value and the value computed through Compustat and then only as incremental to earnings and Compustat simple free cash flow. They thereby make more manipulations to the measure in the application to their models than I do. Next, simple free cash flow values appear to be more predictive of firm performance when computed using Compustat data than when reported by firms themselves. Of the 436 observations with disclosed simple free cash flow values, only 199 are exactly equal to their Compustat counterparts. As there might be rounding differences, I examine how many *cSFCF* observations lie within a 5% and a 10% range of their corresponding *dSFCF* value. For 334 observations, the value computed using Compustat data falls in a 5% range around the value that is disclosed by the firm. This number increases to 345 when widening the range to 10%. Analysing the descriptive statistics of *cSFCF* and *dSFCF* for the 436 *dSFCF* observations, shows that there are clear differences in the variables for this group. This could be expected due to the previously discussed discrepancies between Compustat and firm data due to Compustat's data adjustments, but it might also be indicative of opportunistic behaviour.

The presence of opportunistic behaviour would be consistent with the finding that *dSFCF* is less informative than *cSFCF*, whereas *NGFCF* and *cSFCF* do not differ in predictive abilities. Discrepancies between firm-disclosed and Compustat data should have similarly impacted these findings, as Compustat makes the same evaluations of and adjustments to all collected data to increase comparability. Thus, the significant difference in *dSFCF* and *cSFCF* indeed seems to suggest the presence of opportunistic incentives when disclosing simple free cash flow. On the one hand, simple free cash flow numbers could be more difficult to manipulate than adjusted free cash flow, as the former is solely based on two GAAP measures. However, by disclosing all steps made to obtain adjusted free cash flow, firms might have less room for opportunistic manipulation than when simply only stating the only adjustment under the title 'capital expenditures'. Adame et al. (2018) show that the initiation of SFCF disclosures tends to be primarily opportunistically incentivized, although the decision to continue disclosures appears to be more influenced by the information incentive. This focuses on the actual decision to disclose, but not on the information content of the disclosed SFCF measure itself. My results suggest that opportunistic incentives affect standardized free cash flow disclosures, since these voluntarily disclosed values are less predictive of firm performance than their Compustat counterparts. In none of the press releases that contain SFCF data, was the measure actually labelled as 'simple' or 'standardized', although this is a widely recognized term. This can either be because firms do not recognize the term or because by actually labelling their free cash flow as standardized, they imply that their computation truly only comprises of operating cash flow and capital expenditures as purchases of fixed assets, which eliminates room for manipulation. Further, the amounts included in capital expenditures are not always disclosed in detail. For instance, some firms only show that they deduct capital expenditures from operating cash flow, but then do not discuss what they view as capital

expenditures. Others only indicate whether proceeds from sales of fixed assets are included in (net) capital expenditures (that would then lead to the label of adjusted free cash flow in this study) but do not state other specifications. In conclusion, these findings and observations suggest that managers tend to be more opportunistically incentivized when disclosing simple free cash flow, whereas these incentives are less influential when managers disclose adjusted free cash flow. Apparently, managers are motivated more honestly and with the intend to provide information to investors and others when they make additional adjustments to obtain adjusted free cash flow. Further, they are apparently able to hide more adjustments and other manipulations under the label of capital expenditures than would be expected based on the fact that it is a GAAP measure. Notwithstanding these inferences, the presence of opportunistic incentives does not necessarily include information incentives (Bowen et al., 2005). My findings also show this, as *dSFCF* has significant coefficients in all its models. This indicates that, although the measure appears to be used more opportunistically than the other two free cash flow measures, it is to some extent predictive of firm performance.

7 Conclusion and discussion

This thesis examines the informativeness of non-GAAP free cash flow and its ability to predict firm performance. I compare non-GAAP adjusted free cash flow with its most comparable GAAP measure, operating cash flow, in their predictive ability of both quarterly and yearly future operating cash flows. Overall, I find no difference in the information content of the two measures. As free cash flow is a non-GAAP measure, firms are flexible in the computational decisions they make. Based on firms' computations, free cash flow can be separated into a standardized and an adjusted measure. When observations are classified into these two distinct groups and firm performance is measured as same-quarter operating cash flows of the subsequent year, I find that the standardized free cash flows are less predictive of firm performance than the adjusted non-GAAP measure. In terms of yearly future cash flows, I find no significant difference in the informativeness of the two non-GAAP measures. The results are generally robust for the choice of performance measure. When using earnings before extraordinary items as firm performance, the difference in coefficients of the standardized and adjusted free cash flow variables is now insignificant for both the quarterly and yearly dependent variables. The difference in ability to predict quarterly firm performance of standardized free cash flows and adjusted free cash flows thus depends on the chosen performance measure. Next, I examine the change in predictive ability of adjusted free cash flows over time. The results show a positive time-trend when firm performance is defined as operating cash flows of the same quarter of the next year, but I observe no difference in predictive ability when using yearly future cash flows. So, my results partially support the expected increase in informativeness of adjusted free cash flow over time. Finally, I compare firm-disclosed free cash flow values with those computed through Compustat. I find that Compustat simple free cash flow is more predictive of firm performance than firm-disclosed standardized measures. I do not find a significant difference in predictive abilities of Compustat standardized values and firm-disclosed adjusted free cash flow numbers.

Contrary to prior evidence on earnings, I do not find that the non-GAAP measure is more informative than the corresponding GAAP measure. Existing literature on this topic focuses on earnings and, to my knowledge, no paper has yet examined free cash flows in ways similar to mine. This thesis, therefore, expands the existing non-GAAP literature. I show that although evidence exists in favour of non-GAAP earnings over GAAP earnings, this is not the case for cash flows. Adame et al. (2018) find that investors are increasingly paying attention to free cash flows, but my research suggests that this does not necessarily provide them with more information than operating cash flows would. A word of caution is required here, as this is based on Compustat GAAP operating cash flow data, whereas investors tend to look at firm-disclosed data. Discrepancies might exist between the two, so further research is required to compare free cash flow data with operating cash flow data that is disclosed directly by firms. Further, the results of this thesis should not be interpreted to mean that managers should stop disclosing adjusted free cash flow numbers. Although they might not be more predictive of firm performance than GAAP operating cash flow, investors are paying more attention to them (Adame

et al., 2018). Thus, it could still be useful for managers to report these values to attract attention from investors. Moreover, this research shows that firm-disclosed free cash flow values are predictive of firm performance. So, if circumstances, such as lack of time, require managers to make choices in non-GAAP disclosures, they could choose to leave out free cash flow disclosures without worrying about removing the most valuable measure in comparison to GAAP operating cash flow. However, in any other situation, free cash flows clearly provide information on firm performance. Particularly because investors are paying increasingly more attention to free cash flows, my research shows that managers would do well by reporting these values. They, hereby, ensure that if investors do not specifically analyse operating cash flows, investors will still obtain relevant cash flow information from the non-GAAP measure.

Further contributing to non-GAAP literature, I compare three types of free cash flow measures. In comparing both firm-disclosed measures, I find some evidence that simple free cash flow is less informative than adjusted free cash flow. This seems to be further supported by the finding that Compustat simple free cash flow is significantly more informative than when simple free cash flow is disclosed by firms themselves. Although prior research has shown that both opportunism and information incentives do not necessarily exclude each other (Bowen et al., 2005), I find that opportunism motives tend to weigh heavier for managers that disclose simple free cash flow. The results do not show a significant difference between firm-disclosed adjusted free cash flow and Compustat simple free cash flow, which suggests that they do not differ in informativeness. I extent literature on non-GAAP measures by first examining non-GAAP cash flow instead of earnings and then further broaden my contribution by examining multiple types of free cash flow. Specifically, my research suggests that simple free cash flow is used more opportunistically by firms than adjusted free cash flow and that computations based on Compustat data are able to communicate more information than standardized free cash flow as disclosed by firms.

Consistent with prior literature on SEC regulations and guidelines, I find an increase in informativeness of adjusted free cash flow numbers over time for one of my cash flow performance measures. As explained in Chapter 5, it is highly likely that the Compliance and Disclosure Interpretations of 2016 contributed to the increase in informativeness of free cash flow. Comparable observations are made by prior literature regarding Regulation G and the 2010 C&DI's. Regulations and guidelines representing a stricter attitude of the SEC towards non-GAAP measures are associated with a decrease in discrepancies between GAAP and non-GAAP earnings (Heflin & Hsu, 2008) and an increase in informativeness of non-GAAP earnings (Bond et al., 2017). The 2010 C&DI's, however, are associated with a decrease in earnings' information content, which corresponds to the associated change to a more flexible attitude of the SEC. As both earnings and free cash flow belong to the most popular non-GAAP measures (PwC, 2019), I assume that firms react similarly to the SEC's regulations and guidelines for both non-GAAP measures. Following this reasoning, the observed increase in

information content of free cash flow corresponds to the renewed stringent attitude of the SEC, represented by the 2016 C&DI's and the increased scrutiny of the committee.

Overall, these findings are insightful for managers, regulators, investors and other users of financial statements. My thesis confirms the findings of Adame et al. (2018, 2019) that free cash flow values contain valuable information and extends this conclusion to the disclosed measures in general, instead of just focusing on trailing-twelve-months unexpected (Compustat-based) values. Although adjusted free cash flow does not necessarily provide more information than GAAP operating cash flow, it remains valuable to disclose the non-GAAP measure as investors are increasingly paying attention to standardized free cash flow (Adame et al., 2019) and both free cash flow measures provide significantly valuable information. I also find some evidence supporting the informativeness of adjusted free cash flow over the standardized measure, depending on the performance measure of interest. Further, I find evidence on the increase in ability to predict firm performance of adjusted free cash flow over time, when performance is measured using a quarterly orientation. This thesis extends the existing literature on SEC regulations and guidelines by examining the effects of its new guidelines on non-GAAP cash flow measures for the first time. I find that a more stringent attitude and increased scrutiny towards non-GAAP measures is associated with an increase in free cash flow information content. This is valuable information for both financial statement users as regulators. It indicates to investors and others that their increasing attention is not misplaced. For the SEC, this study provides evidence that its new C&DI's achieved their goals to a certain extent. Lastly, I provide strong evidence on the value of Compustat based standardized free cash flow over corresponding firm disclosed numbers. I find that, regardless of the chosen future firm performance measure, SFCF values based on Compustat data provide more information than SFCF values disclosed directly by firms. This is an interesting consideration for researchers in further examination of free cash flow, as Compustat is frequently used as database. Furthermore, the discussion in section 6.2 shows that although disclosed simple free cash flow is predictive of future firm performance, investors and others should apply caution when interpreting these measures and recognize the possibility of opportunistic incentives behind these disclosures. I find no difference in predictive ability of Compustat SFCF and firm-disclosed adjusted free cash flow. This is relevant for investors and other financial statement users, as it means that for firms disclosing non-GAAP adjusted free cash flow, they do not have to worry about retrieving data from Compustat. In predicting future earnings and operating cash flows, both Compustat simple free cash flow and firm-disclosed adjusted free cash flow will provide investors and others with similar information.

Notwithstanding these findings, this study has its limitations. Relating to the last finding on Compustat and firm-disclosed measures, one limitation is found in choice of dependent variables. All these variables are based on Compustat, which is best practice. As mentioned in this thesis, existing literature shows that there might be discrepancies between firm and Compustat data due to either errors or standardization policies of Compustat. Although all models fit relatively well (lowest adjusted-R^2 is 0.4997 for model (7)), I find that my data is affected by these discrepancies. I observe a difference in

values when comparing firm-disclosed standardized free cash flow with Compustat free cash flow data for the same observations. Further research is necessary to fully examine the effects of this observation on the results and to investigate whether implications change when the dependent variables are based directly on data reported by firms themselves.

Second, the sample size used in this thesis is relatively small due to time constraints and manual collection of data. Of the original approximately 14000 press releases, only 934 observations remain due to lack of free cash flow or Compustat data. Further, I analyse only two years of data, which also limits my sample size. Increasing the time period by including more years before and after 2016 will allow for a more extensive analysis on the effects of the 2016 Compliance and Disclosure Interpretations. Including more firms into the sample, for instance by taking the S&P1500 firms, might also improve the results. Although the S&P500 is fairly representative of U.S. firms that are required to file with the SEC, extending the sample by another 1000 organizations might improve the results and lead to different findings. It is possible that my insignificant findings are affected by the small sample size.

Finally, an important consideration in this analysis is that I can only make inferences for firms that already voluntarily disclose free cash flow measures. The goal of this study was not to make inferences on the choice to disclose, but to examine that if firms voluntarily disclose free cash flow, what is the relevance of this measure. As the descriptive analysis shows, there are clear differences in the group of firms that disclose non-GAAP measures versus the group of non-disclosures. Endogeneity concerns are therefore relevant, which is why I have been careful with causal inferences. Future research can use Propensity Score Matching and other methods to account for endogeneity, which then allows for causal inferences. The relevance of this research can also be extended by examining the group of non-disclosures more carefully and comparing them to the firms included in my final sample.

8 Bibliography

Aboody, D. & Kasznik, R. (2000). CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting and Economics, 29*(1), 73-100.

Adame, K., Koski, J. & McVay, S. (2018). Free cash flow disclosure in earnings announcements. Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3134922

Adame, K., Koski, J. & McVay, S. (2019). Why are investors paying more attention to free cash flows? Working paper. https://www.hbs.edu/faculty/conferences/2019-imo/Documents/McVay%20paper.pdf

Bentley, J. W., Cristensen, T. E., Gee, K. H., & Whipple, B. C. (2018). Disentangling managers' and analysts' non-GAAP reporting. *Journal of Accounting Research, 56*(4), 1039-1081.

Bhattacharya, N., Black, E. L., Christensen, T. E., & Larson, C. R. (2003). Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings. *Journal of Accounting and Economics, 36*, 285-319.

Black, D. E., Christensen, T.E., Ciesielski, J. T., & B. C. Whipple. (2018). Non-GAAP reporting: Evidence from academia and current practice. *Journal of Business Finance & Accounting, 45,* 259-294.

Black, E. L., Christensen, T. E., Joo, T. T., & Schmardebeck, R. (2017). The relation between earnings management and non-GAAP reporting. *Contemporary Accounting Research, 34*(2), 750-782.

Bond, D., Czernkowski, R., Lee, Y., & Loyeung, A. (2017). Market reaction to non-GAAP earnings around SEC regulation. *Journal of Contemporary Accounting & Economics, 13*(3), 193-208.

Bowen, R. M., Burgstahler, D., & Daley, L. A. (1986). Evidence on the relationships between earnings and various measures of cash flow. *The Accounting Review, 61*(4), 713-725.

Bowen, R. M., Davis, A. K., & Matsumoto, D. A. (2005). Emphasis on pro forma versus GAAP earnings in quarterly press releases: determinants, SEC intervention, and market reactions. *The Accounting review, 80*(4), 1011-1038.

Bradshaw, M., Christensen, T., Gee, K., & Whipple, B. (2018). Analysts' GAAP earnings forecasts and their implications for accounting research. *Journal of Accounting and Economics, 66*(1), 46-66.

Bradshaw, M. & Sloan, R. (2002). GAAP versus the street: An empirical assessment of two alternative definitions of earnings. *Journal of Accounting Research, 40*(1), 41-66.

Brown, L. & Sivakumar, K. (2003). Comparing the value relevance of two operating income measures. *Review of Accounting Studies, 8*, 561-572.

Brown, N. C., Christensen, T. E., Elliott, W. B., & Mergenthaler, R. D. (2012). Investor sentiment and pro forma earnings disclosures. *Journal of Accounting Research, 50*(1), 1-50.

Christian, C. & Jones, J. (2004). The value-relevance of earnings and operating cash flows during mergers. *Managerial Finance, 30*(11), 16-29.

Collins, D., Maydew, E., & Weiss, I. (1997). Changes in the value-relevance of earnings and book values over the past forty years. *Journal of Accounting and Economics 24*, 39-67.

Curtis, A. B., McVay, S. E., & Whipple, B. C. (2014). The disclosure of non-GAAP earnings information in the presence of transitory gains. *The Accounting Review, 89*(3), 933-958.

Chychyla, R. & Kogan, A. (2015). Using XBRL to conduct a large-scale study of discrepancies between the accounting numbers in Compustat and SEC 10-K filings. *Journal of Information Systems, 29*(1), 37-72.

Dechow, P. M. (1994). Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics, 18*(1), 3-42.

Dechow, P. M., Kothari, S. P., & Watts, R. L. (1998). The relation between earnings and cash flows. *Journal of Accounting and Economics, 25*, 133-168.

Deloitte. (2019, September). A roadmap to non-GAAP financial measures. https://www2.deloitte.com/us/en/pages/audit/articles/a-roadmap-to-non-gaap-financial-measures.html

Dhaliwal, D., Gleason, C., & Mills, L. (2004). Last-chance earnings management: using the tax expense to meet analysts' forecasts. *Contemporary Accounting Research, 21*, 431-457.

Doyle, J. T., Jennings, J. N., & Soliman, M. T. (2013). Do managers define non-GAAP earnings to meet or beat analyst forecasts? *Journal of Accounting and Economics, 56*(1), 40-56.

Finger, C. A. (1994). The ability of earnings to predict future earnings and cash flow. *Journal of Accounting Research, 32*(2), 210-223.

Francis, J. & Schipper, K. (1999). Have financial statements lost their relevance? *Journal of Accounting Research, 37*, 319-352.

Healy, P. M. & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics, 31*(1-3), 405-440.

Heflin, F. & Hsu, C. (2008). The impact of the SEC's regulation of non-GAAP disclosures. *Journal of Accounting and Economics, 46*(2-3), 349-365.

Kim, M. & Kross, W. (2005). The ability of earnings to predict future operating cash flows has been increasing-not decreasing. *Journal of Accounting Research, 43*(5), 753-780.

Kolev, K., Marquardt, C. A., & McVay, S. E. (2008). SEC scrutiny and the evolution of non-GAAP reporting. *The Accounting Review, 83*(1), 157-184.

Leung, E. & Veenman, D. (2018). Non-GAAP earnings disclosure in loss firms. *Journal of Accounting Research, 56*(4), 1083-1137.

Lorek, K. S. & Willinger, G. L. (2009). New evidence pertaining to the prediction of operating cash flows. *Review of Quantitative Finance and Accounting, 32*, 1-15.

Lougee, B. A. & Marquardt, C. A. (2004). Earnings informativeness and strategic disclosure: An empirical examination of "pro forma" earnings. *The Accounting Review, 79*(3), 769-795.

Marques, A. (2006). SEC interventions and the frequency and usefulness of non-GAAP financial measures. *Review of Accounting Studies, 11*(4), 549-574.

Miller, J. S. (2009). Opportunistic disclosures of earnings forecasts and non-GAAP earnings measures. *Journal of Business Ethics, 89*, 3-10.

Nallareddy, S., Sethuraman, M., & Venkatachalam, M. (2018). Earnings or cash flows: Which is a better predictor of future cash flows? Working paper.

Nichols, D. C. & Wahlen, J. M. (2004). How do earnings numbers relate to stock returns? A review of classic accounting research with updated evidence. *Accounting Horizons, 18*(4), 263-286.

PricewaterhouseCoopers. (2019, October). Non-GAAP measures and the ongoing dialogue: What you should know. https://www.pwc.com/us/en/cfodirect/publications/in-the-loop/non-gaap-measures.html

Sloan, R. G. (1996). Using earnings and free cash flow to evaluate corporate performance. *Journal of Applied Corporate Finance, 9*(1), 70-79.

Stata. (n.d.). vce,options – Variance estimators. https://www.stata.com/manuals13/xtvce_options.pdf

Tuovila, A. (2020). *Operating Cash Flow (OCF)*. Investopedia. https://www.investopedia.com/terms/o/operatingcashflow.asp

Young, S. (2004). The drivers, consequences and policy implications of non-GAAP earnings reporting. *Accounting and Business Research, 44*(4), 444-465.

Table 1 Overview of keywords

Keywords used in Perl code 2	Count 2014	Count 2018
(non-GAAP) free cash flow	31	30
(non-GAAP) FCF	0	0
(non-GAAP) adjusted cash flow (from operations)	0	0
(pro forma) operating cash flow	1	1
(pro forma) cash (flow) from operations	0	0
(pro forma) adjusted cash flow (from operations)	0	0
free cash flow	761	950
FCF	966	1222
(pro forma) free cash flow	0	1
(pro forma) FCF	0	0
operating cash flow less capital expenditures	14	20
cash (flow) from operations less capital expenditures	0	0
Total found keywords	1773	2224

Table 2 Sample selection

Panel A Steps to obtain sample firms		
	2014	2018
S&P500 firms 31/12/2018	500	
Less: Firms with Compustat data problems	5	4
Less: Firms not disclosing quarterly (S)FCF data	385	356
Less: Firms that do not provide explanations/ calculations for all quarterly (S)FCF values	1	0
Less: Firms in the financial industry (GICS 40)	2	4
Final sample	107	136

Panel B Steps to obtain total observations		
8-K filings/press releases of S&P500 firms	7080	7204
Less: Not containing any of the keywords	5598	5333
Less: Only containing 'FCF' and no other keywords	966	1222
Press releases of interest	516	649
Less: Not containing quarterly free cash flow values	183	202
Add: Fourth quarter filings with corresponding press releases	92	107
Less: Observations with Compustat data problems	5	6
Less: Observations missing *FUTCFO* data due to 2019 mergers	0	9
Less: Firm-quarter observations without calculation/explanation	1	2
Less: Observations with GICS 40	8	14
Total observations	411	523

Panel A describes the sample selection of the firms included in the final sample. The starting point includes all 500 unique firms listed on S&P500 at 31 December 2018. From then, firms for which Compustat lacked data, firms that did not disclose free cash flow or did not explain their computations and firms in the financial industry (GICS 40). Some firms disclose free cash flow numbers in both 2014 and 2018. The total unique firms included in the final sample (151) is therefore less than the sum of 2014 and 2018 firms (243). Panel B describes the selection process of the observations. The starting point corresponds to that of Panel A: the press releases are those of the same S&P500 firms I start with in Panel A. I download the documents from the SEC EDGAR database using Perl. Keyword analysis is done next, again using Perl coding. Press releases that do not contain free cash flow data are removed and then supplemented with fourth quarter filings/press releases that are done in the first quarter of the subsequent year. This fourth quarter data is collected manually. Next, press releases are matched to Compustat data and those without sufficient data are removed. Finally, I again drop observations of firms that belong to the financial industry.

Table 3 Adjustments made in computation of adjusted non-GAAP free cash flow

Starting point	2014	2018
GAAP operating cash flow	216	275
Net income	8	4
Total cash flow (not just operating)	4	
Total FCF observations	228	279
Adjustments made to starting point		
Acquisition of intangible assets (incl. capitalized software and website development costs)	46	50
Acquisition, merger, restructuring and divesture related adjustments	92	127
Capital expenditures	195	253
Changes in accrual accounts	20	16
Currency impact (e.g. effect of exchange rates)	4	6
Depreciation and amortization (only made when starting point is net income)	11	4
Discontinued operations	8	
Distributions to NCI	4	8
Dividends and share-based compensation (incl. dividend paid and exercised stock options)	60	34
Financing payments (interest, debt, capital leases)	16	23
Hedges	4	4
Insurance proceeds	4	17
Litigation and settlement payments	21	10
Other adjustments	68	83
Pension contributions	15	7
Proceeds from sale of PPE	57	93
Renovations and construction	2	11
Special items	4	7
Tax settlements and payments	33	39
Total cash flow used by investing activities (not just CAPEX)	12	8

This table shows the types of adjustments made by firms that are included in the final sample, to obtain their adjusted free cash flow values. 'Other adjustments' include non-specified items such as "changes in other assets" and items with relatively few observations (4 or less in total) such as fully reimbursable projects, charitable contributions, non-specified transaction costs, a received grant, R&D expenses and goodwill.

Table 4 Variable definitions

Variable	Description
AGE	Firm age determined as the difference between the first year it recorded non-zero assets in Compustat and the relevant calendar year.
ATQ	Total assets as recorded by Compustat.
BTM	Book-to-market ratio of equity. Book value is computed based on Compustat's *CEQQ* and equity market value is a product of Compustat's *CSHOQ* and *PRCC*.
CALY	Calendar year of the observation: either 2014 or 2018. It is used to determine firm age.
CAPINT	Capital intensity, computed as net PPE (*PPENTQ*) scaled by total assets (*ATQ*).
LCAPINT	The natural logarithm of *CAPINT*.
CAPEXQ	Quarterly capital expenses, based on Compustat's *CAPXY*.
CAPXY	Year-to-date capital expenditures in Compustat. Quarterly capital expenditures are computed using this variable, which are then used to calculate simple free cash flow (*cSFCF*).
CEQQ	Total common/ordinary equity.
CFOQ	Quarterly operating cash flow values provided by Compustat.
CSHOQ	Common shares outstanding as registered in Compustat.
DISCL	All disclosed free cash flow observations. This variable thus exists of both *dSFCF* and *NGFCF*.
NGFCF	(Adjusted) non-GAAP free cash flow, computed to managers' own discretion. Frequently used adjustments to calculate the figure are displayed in Table 3.
FUTCFO4	Quarterly future cash flow from operations, calculated by taking operating cash flow four quarters later (*t+4*).
FUTCFOSUM	Sum of future operating cash flows of the next four quarters.
IB4	Quarterly future earnings before extraordinary items, computed by taking Compustat's *IB4* four quarters later (*t+4*).
IBSUM	Sum of next four quarters' earnings before extraordinary items.
Industry fixed effects	Dummy variables based on GICS codes are created to account for industry fixed effects. The industry against which effects are compared is the Information Technology industry (GICS 45).
INTAN	Intangible intensity, calculated as a firm's level of intangibles according to Compustat, scaled by total assets (*ATQ*).
OANCFY	Year-to-date operating cash flow used to compute quarterly cash from operations.
PPENTQ	Quarterly net property, plant and equipment values retrieved from Compustat. This variable is used in the computation of *(L)CAPINT*.
PRCC	Share price, used to calculate the market value of equity.
DISCLOSED	Disclosed free cash flow values, regardless of the computational method applied.
SALESGR	Sales growth. The difference in quarterly sales between the current quarter and the same quarter a year prior (*t-4*), scaled by *ATQ*.

(continued)

Table 4 Variable definitions – *continued*

cSFCF	Standardized/simple free cash flow based on data obtained from Compustat. It is thus computed by deducting *CAPEXQ* from *CFOQ*.
dSFCF	Disclosed SFCF. It represents the values as disclosed by firms themselves.
SIZE	Firm size, measured as total assets (*ATQ*).
LSIZE	The natural logarithm of *SIZE*.
Year dummy variables	Dummy variables based on the combination of calendar year and quarter. E.g., *D14Q4* takes on 1 if the calendar year is 2014 and the calendar quarter is 4.
YEAR1	The first year in which a firm records non-zero assets in Compustat.

Table 5 Descriptive statistics of final sample

Panel A Descriptive statistics per disclosed free cash flow type

	Standardized free cash flow					Adjusted free cash flow				
	Observations	*Mean*	*Q1*	*Median*	*Q3*	*Observations*	*Mean*	*Q1*	*Median*	*Q3*
CFOQ	436	1340.10	213.16	489.75	1649.53	507	905.59	154.50	401.00	1043.00
NGFCF						507	501.50	61.60	251.00	651.00
dSFCF	436	960.43	129.25	337.00	1218.50					
CAPEXQ	436	442.56	47.45	119.00	292.50	507	438.94	49.00	142.00	436.00
SIZE	436	41485.17	7965.94	17912.79	44804.00	507	33968.33	7886.00	18219.00	40419.00
AGE	436	37.45	18.00	34.00	61.00	507	35.02	17.00	31.00	54.00
CAPINT	436	0.17	0.08	0.12	0.23	507	0.26	0.09	0.18	0.38
INTAN	436	0.37	0.20	0.36	0.52	507	0.35	0.13	0.32	0.54
BTM	436	0.25	0.11	0.24	0.33	507	0.32	0.16	0.28	0.41
SALESGR	436	0.01	0.00	0.01	0.02	507	0.01	0.00	0.01	0.02
DEnergy	436	0.00	0.00	0.00	0.00	507	0.06	0.00	0.00	0.00
DMaterials	436	0.06	0.00	0.00	0.00	507	0.05	0.00	0.00	0.00
DIndustrial	436	0.21	0.00	0.00	0.00	507	0.31	0.00	0.00	1.00
DConsumerDiscretionary	436	0.10	0.00	0.00	0.00	507	0.10	0.00	0.00	0.00
DConsumerStaples	436	0.14	0.00	0.00	0.00	507	0.05	0.00	0.00	0.00
DHealthCare	436	0.13	0.00	0.00	0.00	507	0.11	0.00	0.00	0.00
DIT	436	0.22	0.00	0.00	0.00	507	0.16	0.00	0.00	0.00
DCommunicationServices	436	0.11	0.00	0.00	0.00	507	0.13	0.00	0.00	0.00
DUtilities	436	0.01	0.00	0.00	0.00	507	0.02	0.00	0.00	0.00
DRealEstate	436	0.01	0.00	0.00	0.00	507	0.02	0.00	0.00	0.00

(continued)

Table 5 Descriptive statistics of final sample – *continued*

Panel B Full sample descriptive statistics

	Observations	*Mean*	*Q1*	*Median*	*Q3*
CFOQ	934	1104.51	178.03	426.00	1272.00
NGFCF	507	501.50	61.60	251.00	651.00
dSFCF	436	960.43	129.25	337.00	1218.50
cSFCF	934	667.49	87.40	275.75	804.00
DISCL	934	727.47	91.18	285.27	792.00
CAPEXQ	934	441.61	48.00	129.00	342.00
SIZE	934	37469.58	7962.36	18085.91	41640.00
AGE	934	36.37	18.00	33.00	57.00
CAPINT	934	0.22	0.08	0.15	0.30
INTAN	934	0.36	0.16	0.34	0.54
BTM	934	0.29	0.13	0.26	0.39
SALESGR	934	0.01	0.00	0.01	0.02
DEnergy	934	0.03	0.00	0.00	0.00
DMaterials	934	0.04	0.00	0.00	0.00
DIndustrial	934	0.27	0.00	0.00	1.00
DConsumerDiscretionary	934	0.10	0.00	0.00	0.00
DConsumerStaples	934	0.09	0.00	0.00	0.00
DHealthCare	934	0.12	0.00	0.00	0.00
DIT	934	0.19	0.00	0.00	0.00
DCommunicationServices	934	0.12	0.00	0.00	0.00
DUtilities	934	0.02	0.00	0.00	0.00
DRealEstate	934	0.01	0.00	0.00	0.00

(continued)

Table 5 Descriptive statistics of final sample – *continued*

Panel C Descriptive statistics per year

	2014					*2018*				
	Observations	*Mean*	*Q1*	*Median*	*Q3*	*Observations*	*Mean*	*Q1*	*Median*	*Q3*
CFOQ	411	937.76	147.00	378.00	1233.00	523	1235.55	217.74	490.50	1379.00
NGFCF	228	419.31	45.00	180.74	450.50	279	568.67	88.63	327.20	733.00
dSFCF	192	931.74	89.90	333.65	1163.00	244	983.00	157.82	338.00	1284.50
cSFCF	411	562.71	60.44	213.00	766.00	523	749.84	114.00	329.00	888.00
DISCL	411	683.71	55.64	234.00	712.00	523	761.86	124.30	335.80	854.90
CAPEXQ	411	373.11	41.26	112.83	349.00	523	495.44	55.20	137.00	342.00
SIZE	411	32278.05	7678.00	15304.56	36137.00	523	41549.34	8473.17	20538.70	46963.00
AGE	411	33.98	16.00	30.00	54.00	523	38.24	20.00	35.00	58.00
CAPINT	411	0.22	0.08	0.16	0.34	523	0.21	0.08	0.15	0.27
INTAN	411	0.34	0.13	0.31	0.52	523	0.37	0.17	0.36	0.56
BTM	411	0.30	0.17	0.29	0.38	523	0.28	0.11	0.24	0.39
SALESGR	411	0.01	0.00	0.01	0.02	523	0.01	0.00	0.01	0.02
Quarter 1	411	0.25	0.00	0.00	0.00	523	0.25	0.00	0.00	1.00
Quarter 2	411	0.25	0.00	0.00	1.00	523	0.25	0.00	0.00	1.00
Quarter 3	411	0.25	0.00	0.00	0.00	523	0.25	0.00	0.00	1.00
Quarter 4	411	0.25	0.00	0.00	1.00	523	0.24	0.00	0.00	0.00

Panel A describes the descriptive statistics per free cash flow type. Both types only include data disclosed by firms themselves. The free cash flow data for this panel is hand collected from press releases using the EDGAR database of the SEC and Perl codes. The first group of observations contains standardized free cash flow data and columns (6) to (10) describe the observations containing adjusted free cash flow data. 9 of these observations overlap, which is why columns (2) and (7) do not add up to 934. The final 10 rows of Panel A and B show industry dummy variables. The *D* stands for 'dummy', the industry it represents is stated after. Panel C shows the descriptive statistics per year. Columns (2) to (5) of this panel describe the data on 2014 and columns (6) to (10) refer to 2018. The last 4 rows of this panel describe dummy variables on the calendar quarters for each year. Table 4 describes the variable definitions. I winsorize all continuous variables at 1st and 99th percentiles to account for the effects of extreme outliers.

Table 6 Descriptive statistics of non-disclosers

Panel A Total descriptive statistics

	Observations	*Mean*	*Q1*	*Median*	*Q3*
CFOQ	2560	849.37	153.78	352.22	842.15
cSFCF	2560	498.12	41.73	181.31	495.54
CAPEXQ	2560	322.97	29.00	84.66	303.84
SIZE	2560	62829.18	6570.02	16718.00	43491.05
AGE	2560	38.13	21.00	34.00	57.00
CAPINT	2560	0.24	0.05	0.14	0.38
INTAN	2560	0.22	0.03	0.16	0.36
BTM	2560	0.36	0.17	0.29	0.50
SALESGR	2560	0.20	0.08	0.15	0.26
DEnergy	2560	0.08	0.00	0.00	0.00
DMaterials	2560	0.06	0.00	0.00	0.00
DIndustrial	2560	0.11	0.00	0.00	0.00
DConsumerDiscretionary	2560	0.16	0.00	0.00	0.00
DConsumerStaples	2560	0.07	0.00	0.00	0.00
DHealthCare	2560	0.14	0.00	0.00	0.00
DIT	2560	0.13	0.00	0.00	0.00
DCommunicationServices	2560	0.02	0.00	0.00	0.00
DUtilities	2560	0.06	0.00	0.00	0.00
DRealEstate	2560	0.02	0.00	0.00	0.00

(continued)

Table 6 Descriptive statistics of non-disclosers – *continued*

Panel B Descriptive statistics per year

	2014					*2018*				
	Observations	*Mean*	*Q1*	*Median*	*Q3*	*Observations*	*Mean*	*Q1*	*Median*	*Q3*
CFOQ	1356	770.48	133.79	311.50	773.50	1204	938.23	172.30	388.10	898.50
cSFCF	1356	409.85	33.75	159.45	403.40	1204	597.54	61.16	217.51	573.85
CAPEXQ	1356	325.13	26.71	81.89	289.00	1204	320.55	31.60	88.13	324.50
SIZE	1356	57977.63	5536.62	15051.54	38573.50	1204	68293.23	8303.10	18957.00	46642.00
AGE	1356	36.47	20.00	31.00	54.00	1204	39.99	24.00	35.00	58.00
CAPINT	1356	0.24	0.05	0.14	0.37	1204	0.24	0.05	0.13	0.39
INTAN	1356	0.21	0.03	0.15	0.34	1204	0.24	0.03	0.17	0.40
BTM	1356	0.36	0.18	0.29	0.49	1204	0.36	0.15	0.30	0.52
SALESGR	1356	0.21	0.08	015	0.27	1204	0.19	0.07	0.14	0.24
Quarter 1	1356	0.25	0.00	0.00	0.00	1204	0.25	0.00	0.00	0.00
Quarter 2	1356	0.25	0.00	0.00	0.00	1204	0.25	0.00	0.00	0.00
Quarter 3	1356	0.25	0.00	0.00	0.00	1204	0.25	0.00	0.00	0.00
Quarter 4	1356	0.26	0.00	0.00	1.00	1204	0.25	0.00	0.00	1.00

Panel A describes the descriptive statistics of all observations that do not contain free cash flow data. Included are firm-quarter observations of firms listed on the S&P500 index at 31 December 2018. This group includes 361 unique firms. Combined with the 151 unique firms for which I have free cash flow data, it means that 6 firms are included both in this group and in my main sample. These firms thus have year-quarters in which they do disclose free cash flow data and year-quarters in which they do not do this. The final 10 rows of Panel A show industry dummy variables. The *D* stands for 'dummy', the industry it represents is stated after. Panel B shows the descriptive statistics of the non-discloser group per year. The last 4 rows of this panel describe dummy variables on the calendar quarters for each year. Table 4 describes the variable definitions. I winsorize all continuous variables at 1st and 99th percentiles to account for the effects of extreme outliers.

Table 7 Predictive ability of operating and free cash flow measures

Panel A Firm performance as future cash flows of 1 calendar year later

	Firms disclosing adjusted non-GAAP free cash flow		Firms disclosing standardized free cash flow
	(1)	(2)	(3)
Dependent variable	Future operating cash flows – 4 quarters ahead *FUTCFO4*		
CFOQ	0.86		
	(14.95)***		
NGFCF		0.914	
		(9.48)***	
dSFCF			0.615
			(4.86)***
AGE	-0.978	-4.844	-17.57
	(-0.64)	(-2.26)*	(-5.07)***
ln(*SIZE)*	198.961	550.274	773.672
	(3.80)***	(8.24)***	(6.68)***
INTAN	299.508	574.439	-54.698
	(1.50)	(2.63)**	(-0.14)
BTM	-468.64	-931.832	155.774
	(-3.06)**	(-5.12)***	(0.38)
SALESGR	2577.774	9115.089	5783.606
	(1.51)	(3.14)**	(2.30)*
ln(*CAPINT*)	20.869	238.495	767.424
	(0.42)	(4.78)***	(5.70)***
Year-quarter FE	Included	Included	Included
Industry FE	Included	Included	Included
Observations	507	507	436
Adjusted-R^2	0.8565	0.7259	0.7188

(continued)

Table 7 Predictive ability of operating and free cash flow measures – *continued*

Panel B Firm performance as sum of future cash flows over the subsequent four calendar quarters

	Firms disclosing adjusted non-GAAP free cash flow		Firms disclosing standardized free cash flow
	(1)	(2)	(3)
Dependent variable	Future operating cash flows – sum of next four quarters *FUTCFOSUM*		
CFOQ	2.331		
	(7.11)***		
NGFCF		2.364	
		(5.86)***	
dSFCF			2.077
			(5.11)***
AGE	-10.323	-20.583	-80.746
	(-1.26)	(-2.38)***	(-6.24)***
ln(*SIZE)*	1815.781	2818.333	3559.121
	(4.51)***	(10.12)***	(9.43)***
INTAN	1591.774	2355.24	-1989.648
	(1.90)	(2.58)*	(-1.40)
BTM	-3004.718	-4328.316	10.752
	(-4.20)***	(-6.59)***	(0.01)
SALESGR	31304.84	49150.15	17049.19
	(2.22)*	(3.76)***	(1.70)
ln(*CAPINT*)	561.747	1166.332	2940.278
	(2.60)**	(5.52)***	(6.78)***
Year-Quarter FE	Included	Included	Included
Industry FE	Included	Included	Included
Observations	507	507	436
Adjusted-R^2	0.7944	0.7155	0.7542

Panel A displays the results of OLS regressions using future cash flows from operations, of four quarters later, as dependent variable. Panel B displays the same regression models but uses the sum of operating cash flows of the next four calendar quarters as dependent variable. Regressions are done on current-period operating cash flow, disclosed adjusted free cash flow and disclosed standardized free cash flow measures. Included control variables are discussed in section 4.2 and Table 4. Industry and year-quarter fixed effects are included as dummy variables. They are not tabulated except in the descriptive statistics. Industry dummy variables are based on GICS codes. I winsorize all continuous variables at the 1st and 99th percentiles. Standard errors and t-statistics are robust for clustering by firm and year-quarter. I indicate the statistical significance levels of 0.001, 0.01, and 0.05 with ***, **, and * respectively.

Table 8 Predictive ability of adjusted free cash flow over time

Panel A Firm performance as future cash flows of 1 calendar year later

	2014	2018
	(4)	(5)
Dependent variable	Future operating cash flows – 4 quarters ahead *FUTCFO4*	
NGFCF	0.635	1.065
	(6.49)***	(8.47)***
AGE	-2.752	-5.535
	(-0.80)	(-2.12)*
ln(*SIZE)*	624.994	551.042
	(4.85)***	(8.80)***
INTAN	227.213	908.741
	(0.82)	(2.81)**
BTM	-975.669	-1252.446
	(-4.25)***	(-4.09)***
SALESGR	8415.000	6708.68
	(1.38)	(2.38)*
ln(*CAPINT*)	101.901	333.769
	(1.42)	(5.07)***
Year-quarter FE	Included	Included
Industry FE	Included	Included
Observations	228	279
Adjusted-R^2	0.6543	0.7797

(continued)

Table 8 Predictive ability of adjusted free cash flow over time – *continued*

Panel B Firm performance as sum of future cash flows of the next four calendar quarters

	2014	2018
	(4)	(5)
Dependent variable	Future operating cash flows – sum of next four quarters *FUTCFOSUM*	
NGFCF	1.386	2.464
	(4.22)***	(4.13)***
AGE	-0.427	-31.039
	(-0.06)	(-2.41)*
ln(*SIZE)*	2707.216	3257.111
	(9.12)***	(7.33)***
INTAN	785.283	4409.5
	(0.77)	(3.02)**
BTM	-4468.813	-6127.161
	(-5.52)***	(-5.41)***
SALESGR	20006.07	56272.96
	(2.30)*	(2.97)**
ln(*CAPINT*)	394.971	1925.356
	(1.63)	(5.63)***
Year-quarter FE	Included	Included
Industry FE	Included	Included
Observations	228	279
Adjusted-R^2	0.7340	0.7480

Panels A and B show the results of OLS regressions using future cash flows from operations as dependent variable, quarterly cash flow four quarters later for Panel A and sum of four-quarter future cash flows for Panel B. Regressions are done on adjusted free cash flow values. Model (4) includes only observations of 2014 for both panels. For Model (5), only 2018 observations are used. Included control variables are discussed in section 4.2 and Table 4. Industry and year-quarter fixed effects are included as dummy variables. They are not tabulated except in the descriptive statistics. Industry dummy variables are based on GICS codes. I winsorize all continuous variables at the 1st and 99th percentiles. Standard errors and t-statistics are robust for clustering by firm and year-quarter. I indicate the statistical significance levels of 0.001, 0.01, and 0.05 with ***, **, and * respectively.

Table 9 Predictive ability of operating and free cash flow measures

Panel A Firm performance as earnings of 1 calendar year later

	Firms disclosing adjusted non-GAAP free cash flow		Firms disclosing standardized free cash flow
	(6)	(7)	(8)
Dependent variable	Future earnings – 4 quarters ahead *IB4*		
CFOQ	0.252		
	(4.65)***		
NGFCF		0.307	
		(4.45)***	
dSFCF			0.217
			(4.81)***
AGE	0.761	-0.447	-5.629
	(0.56)	(-0.35)	(-2.88)**
ln(*SIZE)*	213.884	299.851	571.288
	(3.76)***	(6.79)***	(10.76)***
INTAN	-199.668	-125.216	-486.908
	(-1.32)	(-0.80)	(-2.00)*
BTM	-757.528	-870.267	-625.234
	(-4.93)***	(-5.95)***	(-2.61)**
SALESGR	-149.433	1725.685	183.715
	(-0.08)	(0.97)	(0.14)
ln(*CAPINT*)	-20.060	38.787	208.863
	(-0.52)	(1.05)	(3.50)**
Year-quarter FE	Included	Included	Included
Industry FE	Included	Included	Included
Observations	507	507	436
Adjusted-R^2	0.5218	0.4997	0.6790

(continued)

Table 9 Predictive ability of operating and free cash flow measures – *continued*

Panel B Firm performance as future cash flows of 1 calendar quarter later

	Firms disclosing adjusted non-GAAP free cash flow		Firms disclosing standardized free cash flow
	(6)	(7)	(8)
Dependent variable	Future earnings – sum of next four quarters *IBSUM*		
CFOQ	1.102		
	(6.39)***		
NGFCF		1.299	
		(5.54)***	
dSFCF			0.86
			(6.87)***
AGE	1.304	-3.894	-20.358
	(0.26)	(-0.84)	(-3.68)***
ln(*SIZE)*	698.706	1093.665	2152.652
	(3.46)***	(5.94)***	(11.81)***
INTAN	-1304.491	-972.098	-1786.487
	(-2.38)*	(-1.67)	(-2.50)*
BTM	-2700.82	-3219.597	-3460.844
	(-5.13)***	(-5.94)***	(-5.00)***
SALESGR	66.231	8310.291	1278.228
	(0.01)	(1.28)	(0.31)
ln(*CAPINT*)	-30.599	232.232	725.358
	(-0.21)	(1.60)	(3.66)***
Year-quarter FE	Included	Included	Included
Industry FE	Included	Included	Included
Observations	507	507	436
Adjusted-R^2	0.5773	0.5416	0.7827

Panel A displays the results of OLS regressions using future earnings before extraordinary items, of the same quarter of the subsequent year, as dependent variable. Panel B displays the same regression models but uses the sum of earnings before extraordinary items over the subsequent four quarters as dependent variable. Regressions are done on current-period operating cash flow, disclosed adjusted free cash flow and disclosed standardized free cash flow measures. Included control variables are discussed in section 4.2 and Table 4. Industry and year-quarter fixed effects are included as dummy variables. They are not tabulated except in the descriptive statistics. Industry dummy variables are based on GICS codes. I winsorize all continuous variables at the 1st and 99th percentiles. Standard errors and t-statistics are robust for clustering by firm and year-quarter. I indicate the statistical significance levels of 0.001, 0.01, and 0.05 with ***, **, and * respectively.

Table 10 Predictive ability of Compustat based standardized free cash flow

Panel A Firm performance as future cash flows of 1 calendar year later				
	Firms disclosing adjusted free cash flows	Firms disclosing standardized free cash flows	Firms disclosing adjusted free cash flows	Firms disclosing standardized free cash flows
	(9)	(10)	(11)	(12)
Dependent variable	Quarterly future operating cash flows – four quarters ahead *FUTCFO4*	Quarterly future operating cash flows – four quarters ahead *FUTCFO4*	Quarterly earnings – four quarters ahead *IB4*	Quarterly earnings – four quarters ahead *IB4*
cSFCF	0.961	1.170	0.309	0.350
	(9.50***	(9.98)***	(4.49)***	(4.25)***
AGE	-3.958	-10.938	-0.137	-4.017
	(-1.88)	(-3.10)**	(-0.10)	(-2.02)*
ln(*SIZE)*	511.358	366.213	292.878	480.991
	(8.62)***	(3.63)***	(6.28)***	(6.71)***
INTAN	351.851	140.97	-194.866	-444.57
	(1.44)	(0.36)	(-1.28)	(-1.77)
BTM	-630.346	889.768	-780.737	-437.421
	(-4.20)***	(2.21)*	(-5.64)***	(-1.99)*
SALESGR	5194.962	5651.331	477.178	237.61
	(2.40)*	(2.24)*	(0.26)	(0.17)
ln(*CAPINT*)	220.503	669.687	34.09	183.68
	(4.05)***	(5.49)***	(0.97)	(3.25)**
Year-quarter FE	Included	Included	Included	Included
Industry FE	Included	Included	Included	Included
Observations	507	436	507	436
Adjusted-R^2	0.7657	0.7633	0.5084	0.6824

(continued)

Table 10 Predictive ability of Compustat based standardized free cash flow – *continued*

Panel B Firm performance as sum of future cash flows of the next four calendar quarters				
	Firms disclosing adjusted free cash flows (9)	Firms disclosing standardized free cash flows (10)	Firms disclosing adjusted free cash flows (11)	Firms disclosing standardized free cash flows (12)
Dependent variable	Future operating cash flows – sum of next four quarters *FUTCFOSUM*	Future operating cash flows – sum of next four quarters *FUTCFOSUM*	Future earnings – sum of next four quarters *IBSUM*	Future earnings – sum of next four quarters *IBSUM*
cSFCF	2.379	3.431	1.273	1.544
	(5.69)***	(6.84)***	(5.17)***	(7.21)***
AGE	-18.199	-64.432	-2.552	-12.166
	(-1.96)	(-4.59)***	(-0.49)	(-2.09)*
ln(*SIZE)*	2765.944	2621.368	1080.367	1662.353
	(9.63)***	(5.86)***	(6.02)***	(7.32)***
INTAN	1820.166	-1552.255	-1253.066	-1552.565
	(1.97)*	(-1.08)	(-2.20)*	(-2.19)*
BTM	-3641.597	1895.312	-2872.126	-2540.109
	(-5.50)***	(1.03)	(-5.44)***	(-3.74)***
SALESGR	39553.69	17447.41	3211.463	1243.165
	(3.00)**	(1.66)	(0.48)	(0.30)
ln(*CAPINT*)	1134.567	2687.862	219.518	602.494
	(5.33)***	(6.60)***	(1.53)	(3.20)**
Year-quarter FE	Included	Included	Included	Included
Industry FE	Included	Included	Included	Included
Observations	507	436	507	436
Adjusted-R^2	0.7253	0.7630	0.5463	0.8002

Both panels solely use Compustat-based simple free cash flow as predictor variable. Models (9) and (10) display results using the same-quarter operating cash flow of the subsequent year as dependent variable. In models (11) and (12), similar earnings are used as dependent variable. Panel B again uses operating cash flow in the first two regression columns and earnings before extraordinary items in the last two. Only now, the sum over the subsequent four calendar quarters is used. In both panels, columns (9) and (11) include the 507 observations for which I have adjusted free cash flow data. the 436 firm-quarter observations with disclosed simple free cash flow values are used in columns (10) and (12). This allows for a clear comparison between *cSFCF* and *NGFCF* and *cSFCF* and *dSFCF*, since each comparison can be done based on the exact same observations. Included control variables are discussed in section 4.2 and Table 4. Industry and year-quarter fixed effects are included as dummy variables. They are not tabulated except in the descriptive statistics. Industry dummy variables are based on GICS codes. I winsorize all continuous variables at the 1st and 99th percentiles. Standard errors and t-statistics are robust for clustering by firm and year-quarter. I indicate the statistical significance levels of 0.001, 0.01, and 0.05 with ***, **, and * respectively.

Table 11 Pair-wise Pearson coefficients of correlation

	FUTCFO4	*FUTCFOSUM*	*CFOQ*	*NGFCF*	*dSFCF*	*cSFCF*	*AGE*	*LSIZE*	*INTAN*	*LCAPINT*	*SALESGR*	*BTM*
FUTCFO4	1.000											
FUTCFOSUM	0 .929***	1.000										
CFOQ	0.939***	0.909***	1.000									
NGFCF	0.760***	0.665***	0.828***	1.000								
dSFCF	0.745***	0.737***	0.823***	0.98***	1.000							
cSFCF	0.813***	0.76***	0.902***	0.842**	0.866***	1.000						
AGE	0.117***	0.116***	0.143***	0.287***	0.058	0.152***	1.000					
LSIZE	0.658***	0.692***	0.690***	0.517***	0.658***	0.614***	0.381***	1.000				
INTAN	-0.061	-0.080*	-0.087**	-0.005	-0.043	-0.013	-0.066*	0.038	1.000			
LCAPINT	0.166***	0.177***	0.179***	0.073	0.032	0.015	0.171***	0.113***	-0.5***	1.000		
SALESGR	0.037	0.061	0.022	-0.042	-0.059	-0.004	-0.168***	-0.140***	-0.235***	0.065*	1.000	
BTM	0.051	0.048	0.055	-0.003	0.053	-0.045	-0.010	0.288***	0.251***	0.078*	-0.187***	1.000

*Pearson coefficients of correlation are presented below the diagonal. Coefficients are based on the full sample (934 observations). Variable definitions can be found in Appendix Table 4. ***, **, and * indicate 5%, 1% and 0.1% significance levels respectively.*