



# The unusual debate on non-GAAP reporting in the current standard practice. The lens of corporate governance

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## Abstract

The use of non-GAAP performance measures is a widespread, and certainly not a recent, phenomenon. In fact, companies increasingly believe that non-GAAP financial measures play a critical role in their financial communication strategy, and investors often rely on a wide range of non-GAAP measures to evaluate companies' performance. However, anecdotal evidence also highlights a misleading use of non-GAAP financial measures, these metrics being disclosed more prominently than comparable GAAP metrics, and inconsistently presented from period to period. The apparent 'schizophrenic' nature of non-GAAP measures has often attracted scholars' attention, while national and international security agencies and standard setters have recently renewed their interest in this topic. Therefore, this paper reviews the nearly two decades of research on non-GAAP reporting to offer insights into what academics have learned so far about non-GAAP reporting practices. In particular, this paper analyses the main objectives of the research, the related setting under investigation, the role of non-GAAP disclosure, and the type of non-GAAP metrics, with the aim of describing the evolution of this field of research over time and providing a structured reference point to carry research forward into specific sub-areas of interest.

**Keywords** Non-GAAP measures · Alternative performance measures · Pro-forma earnings · Financial disclosure · Standard setting

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## 1 Introduction

In 2011, Groupon Inc. received a SEC comment letter questioning the use in the IPO pre-filing of the “adjusted consolidated segment operating income”, an unprecedented non-GAAP metric which excluded several major expenses, including marketing, stock-based compensation and acquisition-related costs (Barsky and Catanach 2014). This measure was about 190 US million dollars greater than income from operations. In its 2013 Form10-K filing with the SEC, Twitter reported two non-GAAP metrics, adjusted EBITDA and non-GAAP net loss, differing from GAAP net loss by more than 650 US million dollars, to draw a rosier picture than GAAP might otherwise allow (Black et al. 2018). From 2013 to 2015, LinkedIn has used a similar approach by removing depreciation and amortization charges and the cost of stock-based compensation in order to turn a GAAP loss of 180 US million dollars into an adjusted EBITDA of 1.37 US billion dollars (Sherman and Young 2018). In addition, the Wall Street Journal reports that more than 94 per cent of Standard & Poor’s (S&P) 500 choose to report non-GAAP information, as they have the potential to increase the GAAP profit by 44 per cent (Cohn 2016).

Anecdotal evidence on the pervasive reporting of non-GAAP measures provides excellent examples of less than transparent use of non-GAAP disclosures and poses fundamental challenges for scholars, investors, analysts and policymakers.

Pro forma or non-GAAP reporting largely results from the shortcomings of the financial statements, which provides retrospective and not future-oriented information. Actually, managers revise and adjust GAAP financial results in an attempt to convert historical performance measures into forward-looking information. In this vein, items of the income statement which are extraordinary and non-recurring may be adjusted in an attempt to predict future performance, reduce information asymmetry, and communicate the managers’ informed view of the transitory nature of these elements.

However, as the decision to adjust GAAP measures is largely down to managerial discretion, managers might mislead investors by opportunistically excluding some negative events from income in order to artificially inflate investor expectations of future profitability. In addition, managerial discretion when making adjustments to create non-GAAP earnings has the potential to diminish the usefulness, comparability and transparency of accounting information.

Concerned that investors may be misled by the disclosure of non-GAAP measures, regulatory authorities have progressively intervened on this topic in a paradoxical attempt to discipline the non-GAAP reporting practices (Sherman and Young 2018). To quote Siegel (2014), “At first glance it might seem unusual for a column in the FASB Outlook to be discussing accounting metrics that are not Generally Accepted Accounting Principles (GAAP) promulgated by the FASB”. The SEC, FASB and IASB have all questioned what this increasing reporting tendency means for GAAP-based reporting and whether these measures are misleading to investors.

In this paper, we review the nearly two decades of research on non-GAAP reporting to offer insights on what academics have learned so far about this

reporting practice. We analyse the main objectives of the research, the related setting under investigation, the role of non-GAAP disclosure, and the type of non-GAAP metrics, with the aim of providing a picture of the evolution of this field of research over time.

The paper contributes to the literature by systematizing the fervent academic debate on the use of non-GAAP indicators and highlighting the research topics to which scholars need to pay further attention.

Moreover, identifying when and under what circumstances non-GAAP measures serve as an informative rather than an opportunistic tool, our paper also contributes to practitioners by enabling evidence-based management and decision-making by standard setters and regulators (Aria and Cuccurullo 2017).

The paper is structured as follows. Section 2 provides the theoretical background to the topic. Section 3 illustrates the methodological approach and the bibliographic analysis. Section 4 discusses the findings of our systematic literature review. Section 5 offers contributions and avenues for future research and Sect. 6 concludes.

## 2 Theoretical background: the two competing views on non-GAAP reporting

The number of firms reporting earnings on a non-GAAP basis has dramatically increased over the last two decades, and non-GAAP disclosure is now commonplace in capital market reporting practices. A recent study highlighted the widespread and growing use of non-GAAP indicators by companies included in the S&P 500 index (Audit Analytics 2018). Compared to 59% of such companies in 1996, during the course of 2016, up to 96 per cent of reporting entities included at least one non-GAAP indicator in their financial statement (a percentage that rose to 97 per cent at the end of 2017). A significant increase was also recorded in terms of the number of alternative performance indicators used by companies. While, in 1996, each company communicated an average of 2.35 non-GAAP indicators, 20 years later, the average number of non-GAAP indicators was equal to 7.45. This proliferation of non-GAAP disclosure has generated considerable concern among external users of the financial report, and has attracted the interest of both regulators and standard setters in these alternative performance metrics. Academics and practitioners have been questioning the usefulness of non-GAAP metrics since the 1990s.

Most of the studies on pro forma indicators advocates that managers are mainly motivated by a desire to provide more precise information to stakeholders on core earnings and, in particular, on permanent earnings. However, other researchers find that opportunism might be the reason behind the voluntary disclosure of non-GAAP indicators, especially before regulatory interventions. As a matter of fact, two opposing theoretical perspectives have emerged: the informative and the opportunistic views.

The informative perspective suggests that non-GAAP earnings are thought to be more permanent than GAAP earnings (Bhattacharya et al. 2003) and are likely to be more useful in the prediction of future firm performance (Brown and Sivakumar 2003). Other research places importance on the value relevance of non-GAAP

earnings compared to GAAP results, as they are strongly associated with stock price (Bhattacharya et al. 2003). Further studies highlight that companies which voluntarily disclose non-GAAP results present lower quality GAAP earnings, and the non-GAAP reporting serves the purpose of compensating for the lower informativeness of GAAP results (Lougee and Marquardt 2004). Finally, research has more recently highlighted the positive link between non-GAAP disclosure and the reduction of information asymmetries (Charitou et al. 2018; Huang and Skantz 2016).

On the other hand, the opportunistic perspective assumes that non-GAAP disclosure serves the purpose of misleading financial statement users, as it presents a higher business performance compared to that emerging from the use of GAAP metrics (Marques 2006). Empirical evidence shows that managers disclose pro forma earnings to conceal losses, report positive earnings growth, meet or beat analysts' expectations, and increase investor perceptions of earning credibility (Barth et al. 2012; Black et al. 2012).

Although most of the studies examine the US setting, the phenomenon of non-GAAP earnings is not confined exclusively to US countries. An additional body of research has recently emerged from Australia (Cameron et al. 2012; Malone et al. 2016), New Zealand (Rainsbury et al. 2015), Canada (Cormier et al. 2011), South Africa (Venter et al. 2014) and Europe (Choi and Young 2015), enhancing the understanding of non-GAAP disclosure and its use worldwide. Studies in the European setting have shown that almost 80 per cent of companies in the largest cities report at least one non-GAAP metric in their earnings releases (Isidro and Marques 2015). With reference to the UK setting, the percentage of companies that communicate non-GAAP earnings increased from 40% in 1993 to 75% in 2001, reaching a peak of 90% after the transition to IFRS in 2005 (Petaibanlue and Walker 2013). In spite of the relevance of non-GAAP earnings, there are several differences among countries related to both institutional and economic factors. For example, in the US context, non-GAAP earnings are mainly reported by hi-tech companies, while outside the US, there is no sector specificity. Furthermore, European companies are more consistent in non-GAAP reporting policies than their US counterparts and are less prone to opportunistically exclude recurring items such as depreciation (Isidro and Marques 2015).

Moving from the main research topics on pro forma disclosure, the most investigated settings, and purpose and type of non-GAAP measures, this study provides a systematic review of the literature with the aim of offering insights into the evolution of the research over nearly two decades and pointing out the areas that need further investigation by scholars and practitioners.

### 3 Research method and descriptive results

In order to identify the articles for our systematic literature review (Littell et al. 2008), we applied a four-step methodology, as proposed by Fink et al. (2010). In the first step, we selected our research questions, the bibliographic article database and appropriate search terms. Then we used practical review criteria for inclusion or

exclusion of the relevant literature. In the third step, we developed and applied methodological review criteria. Finally, we synthesized our findings.

### **3.1 First Step: Selecting the research question, database and appropriate search terms**

The underlying research questions for our systematic review were rather broad: What is the understanding of non-GAAP disclosure? What is the role of non-GAAP disclosure? And how is non-GAAP disclosure defined?

To extract the papers for our literature review, we conducted Boolean searches using the truncated search terms “non-GAAP\*” and “pro forma\*” in the title, the abstract, the keywords or the main text. The database searched was the Social Sciences Citation Index (SSCI), incorporated into the online library ISI Web of Science, the most widely used source for literature reviews (Catuogno et al. 2016).

### **3.2 Second step: applying practical screening criteria**

We searched for all contributions written in English without a time restriction, to take into consideration all the most significant contributions up to May 2019. We restricted our search to English to avoid a language bias or a preference for specific languages (Moher et al. 2000). Then we selected contributions according to specific ISI Web of Science Categories (business finance, economics, management, business). As for the document types, we accepted only articles or reviews concerning both empirical and conceptual/theoretical analysis; we excluded conference proceedings, research reports, presentations, book reviews and comments.

As the aim of this review is to give a comprehensive overview of the non-GAAP disclosure literature, quality criteria (i.e. example journal rankings) were not used for exclusion purposes. In addition, publications that only mentioned non-GAAP reporting or in which it was of only secondary importance were excluded.

### **3.3 Third step: applying methodological screening criteria**

In the third step, a review protocol for content analysis of the publications was determined. The categories for examining the selected publications were derived from previous theoretical work (Krippendorff 2004). The review protocol encompassed four sections. The first section contained the bibliographic data of each publication, such as author(s), author affiliation(s), year, journal name, type of publication, keywords and total citations. The second section described the background to the publication: its methodology (for instance, theoretical/conceptual and empirical) and, if applicable, the investigated setting and time period of analysis. The third section focused on the objectives of the research. Firstly, the main research topic (regulation, corporate governance and other characteristics, reporting quality, meet or beat, real effect) was assessed by reading the article. Secondly, we separately recorded the purpose of non-GAAP disclosure (informative or opportunistic). Thirdly, we identified the type of non-GAAP measures (pro forma financial statements, pro

forma earnings/EPS, EBITDA/EBIT/operating income, cash earnings, non-financial metrics).

Three coders (two authors and a research assistant) independently codified the set of articles. The review protocol was pre-tested on a sub-sample of 20 articles with the aim of identifying inconsistencies in the responses and reaching an agreement about the final set of items to be used in the classification. Disagreements were reconciled, and an inter-rater reliability score was calculated. The percentage of agreement was above the threshold for acceptance (Cohen 1960). A review was then conducted on the whole set of articles.

### 3.4 Fourth step: synthesizing our findings

The presentation of the findings is structured according to the review protocol presented above. After the bibliographic analysis, we explained the background to the publication. Finally, we focused on the objectives of the research.

The search within the database yielded 766 hits. Using the inclusion and exclusion criteria, we limited the sources to 181 articles. Secondly, we selected the articles relevant for the analysis according to the entire text of each paper. At the end of this process, 96 articles were removed from the sample. Therefore, the study has been conducted on a sample of 85 articles.

Analysis of the bibliographic data of each publication reveals that the oldest source analysed was published in 2003, the most recent in 2019. The majority of the publications were published after 2010 (Fig. 1).

As the trend in Fig. 1 shows, there is a steadily increasing number of publications, the highest number of papers being published in 2017. Thus, it appears that the topic is becoming more and more important and of increasing interest within the research community. Figure 2 shows the articles that have been published in 35 international journals.

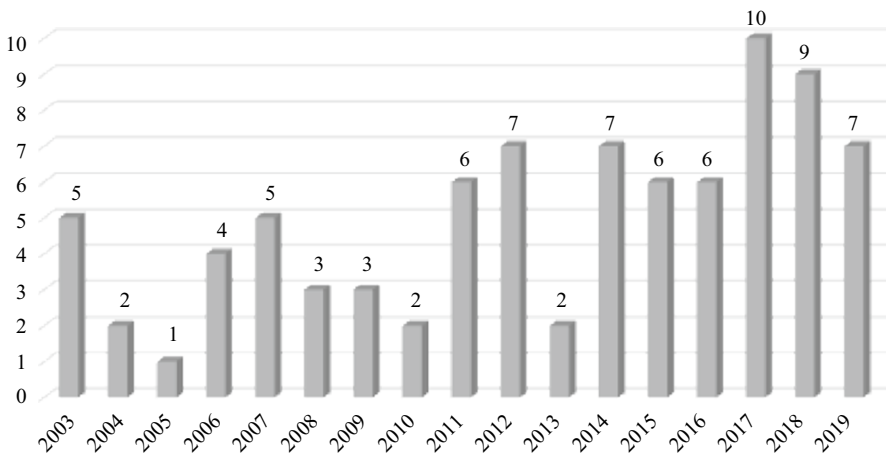


Fig. 1 Overview of articles over time

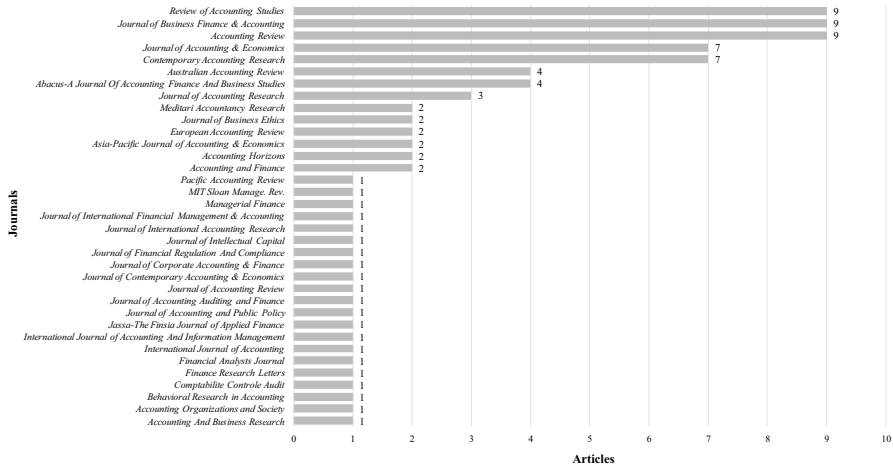


Fig. 2 Most prolific journals

The most prolific journals are the North American journals *Accounting Review* (9) and *Review of Accounting Studies* (9), and the UK’s *Journal of Business Finance and Accounting* (9), followed by the Canadian *Contemporary Accounting Research* (7) and the North American *Journal of Accounting and Economics* (7).

Table 1 Most prolific authors

Author	Academic affiliation	N. Articles
Christensen, TE	Brigham Young Univ, Provo, UT, US	14
Black, EL	Univ Oklahoma, Norman, OK, US	6
McVay, S	NYU, New York, NY, US	5
Marques, A	Univ Nova Lisboa, Fac Econ, P, Lisbon, Portugal	5
Whipple, BC	Univ Georgia, Athens, GA, US	4
Young,S	Univ Lancaster, Dept Accounting & Finance, Sch Management, Lancaster, England	4
Bhattacharya, N	Brigham Young Univ, Marriott Sch Management, Sch Accountancy & Informat Syst, Provo, UT US	3
Choi, YS	Sungkyunkwan Univ, Sch Business, Accounting Sect, Seoul, South Korea	3
Cormier, D	Univ Quebec, Montreal, PQ, Canada	3
Elliott, WB	Univ Illinois, Urbana, IL, US	3
Magnan, M	Concordia Univ, Montreal, PQ, Canada	3
Marquardt, C	CUNY, Baruch Coll, New York, NY, US	3
Soliman, MT	Univ Washington, Sch Business, Seattle, WA, US	3
Black, DE	Duke Univ, Fuqua Sch Business, Durham, NC 27706 US	3

Analysis of the bibliographic data of the publications also highlights that the most prolific authors are the North Americans T. E. Christensen (14), E. L. Black (6) and S. McVay (5), followed by the European A. Marques (5) (Table 1).

Table 2 shows that the most cited article within the ISI Web of Science Core Collection is the paper titled ‘Limited attention, information disclosure, and financial reporting’, co-authored by Hirshleifer and Teoh in 2003. This paper, which is an analytical accounting research, was also one of the first publications issued during the time frame.

As for the background to the research, our analysis reveals that among the sample articles, 10 papers are theoretical research and 75 articles are empirical studies.

Our literature review highlights that empirical research on non-GAAP reporting can be divided into three periods that differ in terms of the main research topic, the purpose of non-GAAP reporting, the setting and the type of non-GAAP measures. Table 3 provides an overview of our findings.

The subsequent Sect. 4 discusses the evolution of the research topics over the first, the second and the third periods.

## **4 Discussion of findings: the evolution of non-GAAP reporting over time**

### **4.1 First period 2003–2009: the role of non-GAAP disclosure in the capital market**

Non-GAAP reporting dates back to the beginning of 2000, with particular reference to the dot-com companies that, due to the peculiarity of their business model, could particularly benefit from the use of alternative performance metrics. Subsequently, the phenomenon has spread beyond the boundaries of technological firms in order to overcome the shortcomings of the traditional financial reporting model (Lev and Zarowin 1999). In particular, since 2001, an increasing percentage of US-listed firms has employed non-GAAP indicators, with no difference among sectors, reaching a peak of 71 per cent of the S&P 500 (Henry 2001). In the meantime, market authorities have engaged in the regulation process of non-GAAP reporting and the 2001 SEC issuance of Cautionary Advice, for example, highlighted the importance of making correct use of non-GAAP indicators.

Our literature review highlights that in the first period the most investigated topic is related to the market effect of non-GAAP reporting, as scholars start to question the disclosure consequences from the capital market perspective. Subsequently, research focuses on the topics of regulation and reporting quality of non-GAAP metrics. Only a few studies analyse corporate governance issues, highlighting the importance of some firm and industry characteristics. Overall, these studies reveal that non-GAAP reporting mainly serves the purpose of filling the information gap of financial statements rather than representing an opportunistic managerial tool.



**Table 2** Most cited articles

Author(s)	Title	Journal	Year	Total citation
Hirshleifer, D; Teoh, SH	Limited attention, information disclosure, and financial reporting	J. Account. Econ.	2003	409
McVay, SE	Earnings management using classification shifting: An examination of core earnings and special items	Account. Rev.	2006	168
Doyle, JT; Lundholm, RJ; Soliman, MT	The predictive value of expenses excluded from pro forma earnings	Rev. Acc. Stud.	2003	140
Bhattacharya, N; Black, EL; Christensen, TE; Larson, CR	Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings	J. Account. Econ.	2003	132
Frederickson, JR; Miller, JS	The effects of pro forma earnings disclosures on analysts' and nonprofessional investors' equity valuation judgments	Account. Rev.	2004	129
Lougee, BA; Marquardt, CA	Earnings informativeness and strategic disclosure: An empirical examination of "pro forma" earnings	Account. Rev.	2004	124
Bowen, RM; Davis, AK; Matsumoto, DA	Emphasis on pro forma versus GAAP earnings in quarterly press releases: Determinants, SEC intervention, and market reactions	Account. Rev.	2005	118
Elliott, WB	Are investors influenced by pro forma emphasis and reconciliations in earnings announcements?	Account. Rev.	2006	102
Brown, LD; Sivakumar, K	Comparing the value relevance of two operating income measures	Rev. Acc. Stud.	2003	96
Kolev, K; Marquardt, CA; Mcvay, SE	SEC scrutiny and the evolution of Non-GAAP reporting	Account. Rev.	2008	70
Bhattacharya, N; Black, EL; Christensen, TE; Mergenthaler, RD	Who trades on pro forma earnings information?	Account. Rev.	2007	68

**Table 3** Overview of the findings

	First period: 2003– 2009	Second period: 2010– 2014	Third period: 2015– 2019
<i>Panel A: topics</i>			
Regulation	4 20%	8 36%	7 21%
Corporate Governance and other characteristics	2 10%	6 27%	5 15%
Market Effect	9 45%	3 14%	6 18%
Reporting Quality	3 15%	3 14%	9 27%
Meet Or Beat	2 10%	2 9%	5 15%
Real Effect	0 0%	0 0%	1 3%
<i>Panel B: Purpose</i>			
Informative	14 70%	13 59%	22 67%
Opportunistic	6 30%	9 41%	11 33%
<i>Panel C: Setting</i>			
US	15 75%	14 64%	15 45%
Europe	2 10%	1 5%	5 15%
Other	0 0%	5 23%	12 36%
Worldwide	3 15%	2 9%	1 3%
<i>Panel D: Type of measure</i>			
Pro Forma Financial Statements	1 5%	1 5%	3 9%
(Pro-Forma/Street) Earnings/Eps	15 75%	18 82%	24 73%
Adj Ebitda/Ebit/Operating	2 10%	1 5%	5 15%
Cash Flow (Cash Earnings)	1 5%	2 9%	0 0%
Non-Financial Metrics	1 5%	0 0%	1 3%
<i>TOT. Articles</i>	20	22	33

#### 4.1.1 Market effect

First studies rely on experimental research aimed at examining the effects of pro forma disclosures on both sophisticated and non-sophisticated investors, finding that professional investors can better interpret pro forma disclosures, while less sophisticated investors can be potentially misled by non-GAAP reporting (Frederickson and Miller 2004). However, the emphasis management places on pro forma earnings, not the mere presence of pro forma earnings, influences non-professional investors' reliance on pro forma disclosures, and this influence is mitigated by the presence of a quantitative reconciliation. Further analysis reveals that the influence of pro forma emphasis on non-professional investors' judgements and decisions seems to be the result of an unintentional cognitive effect as opposed to the perceived informativeness of the earnings figure emphasized by management. Analysts' judgements and decisions are also affected by the presence of reconciliation, but in the opposite direction to those of non-professional investors. Specifically, the presence of a quantitative reconciliation leads analysts to view pro forma earnings as more reliable,

increasing their reliance on the pro forma disclosure in judging the earnings performance of the firm (Elliott 2006). Findings in other experimental settings show that analysts who receive both pro forma and GAAP information expect significantly higher EPS than those who receive GAAP information only. This result suggests that analysts' EPS forecasts can be manipulated by alternative ways of presenting company performance (Andersson and Hellman 2007).

This experimental evidence has subsequently been complemented by the results of archival studies. One of them, using intraday transactions data to distinguish the trading activities of less sophisticated from those of more sophisticated investors, suggests that less sophisticated investors rely significantly more on quarterly earnings press releases that include a pro forma number than on those that do not, while more sophisticated investors exhibit the opposite behaviour. The conclusion is that not only the existence of a pro forma number, but also its strategic placement in the press release, affect the judgement of less sophisticated (but not more sophisticated) investors (Allee et al. 2007). These findings are robust as they persist in other archival settings. In fact, intraday investigation of transactions on the day after the announcement of earnings based on pro forma information reveals that the abnormal net-buying activities of less sophisticated investors is positively associated with the magnitude and sign of the pro forma earnings surprise. In contrast, there is no association between the trading of sophisticated investors and the reporting of pro forma information (Bhattacharya et al. 2007). While these studies suggest that the segment of the market that relies on pro forma earnings information mainly comprises less sophisticated investors, others research reveals that the extent to which investors react to pro forma earnings news depends on the emphasis that managers place on the non-GAAP metrics within the press release. These findings are consistent with managers using emphases in earnings press releases as a disclosure tool (Bowen et al. 2005).

When investigating whether market participants perceive pro forma earnings to be more informative and more persistent than GAAP income, studies conducted during the first time frame are mostly concentrated in high-tech companies reporting frequent GAAP losses. The analyses indicate that pro forma earnings are more informative and more permanent than GAAP operating earnings, and this evidence suggests that market participants believe that pro forma earnings are more representative of core earnings than GAAP operating income (Bhattacharya et al. 2003). Finally, in examining the relevance of GAAP and non-GAAP measures for stock returns, research during this period investigates industry differences and the related non-GAAP preferred metrics. With reference to the airline industry (revenue per passenger mile, cost per available seat mile and load factor), the homebuilding industry (value of new orders and value of order backlog), and retail restaurants (same store sales), results do not provide evidence that the preferred non-GAAP metric dominates earnings in explaining security returns. However, with the exception of homebuilding, it is found that the preferred non-GAAP metrics have more explanatory power compared to GAAP metrics in terms of explaining changes in stock returns (Francis et al. 2003).

Other studies contribute to the debate over pro forma earnings by investigating the effect of components of income excluded from pro forma earnings. In particular,

studies question whether total exclusions, special item, and other exclusions are relevant for future profitability and equity valuation. They find that total exclusions are value relevant, but not in the predicted manner. Moreover, the total forecasting coefficient of special items and other exclusions is significantly positive, as with total exclusions (Landsman et al. 2007).

#### 4.1.2 Regulation

Evidence from studies on market effect has proved to be particularly relevant to standard setters, and several regulations were specifically designed to protect investors from misleading pro forma information, although the initial regulatory efforts were exclusively confined to the US setting. In particular, after the first regulatory attempt which gave rise to the Cautionary Advice in 2001, the Sarbanes–Oxley (SOX) of 2002 prompted the SEC to design normative actions aimed at reducing the opportunistic use of non-GAAP reporting. As a result, research in this period begins to focus on the use of non-GAAP metrics under the issuance of the first guidelines. For instance, examining earnings press releases, a first study finds that, prior to SOX in 2001, over 10 per cent of all US S&P 500 firms discloses pro forma earnings in a potentially misleading manner. However, by 2003, subsequent to the SEC regulation, potentially misleading disclosure practices are observed in less than 1 per cent of earnings press releases. The conclusion is that the SEC regulation has been effective in reducing the either careless or intentionally unethical managerial use of pro forma reporting (Entwistle et al. 2006).

In the same vein, examining the frequency of non-GAAP reporting before and after the introduction of Cautionary Advice and Regulation G, evidence demonstrates that the level of non-GAAP disclosure remains stable between 2001 and 2002 and decreases in 2003 following Regulation G. Furthermore, an accelerated decline is observed in the probability of disclosure of non-GAAP measures other than earnings after the first SEC intervention (Marques 2006). A similar study reports a decline in the disclosure of non-GAAP earnings in favour of GAAP metrics, and a decrease in the magnitude attributed to non-GAAP compared to GAAP earnings from 2003 to 2005 after the SEC intervention. Moreover, after separating the total exclusions into ‘other exclusions’ and ‘special items’, the study finds that both decrease, and assumes that the former are more opportunistic than the latter as they are more representative of future income (Heflin and Hsu 2008). It is also noticed that, despite the higher quality of exclusions in the period following the SEC intervention, managers transform a series of recurring items into special items to face the higher SEC scrutiny (Kolev et al. 2008).

Overall, these studies highlight that the aim of regulators to reduce opportunistic disclosure has been achieved, although there have been unintended consequences from the tighter regulation of non-GAAP disclosures.

#### 4.1.3 Reporting quality

Together with the emerging interest in the effect of regulation on non-GAAP disclosure, scholars start to take an early glance at the quality of non-GAAP reporting in terms of the value relevance and informational properties of pro forma earnings.

Specifically, when testing the value relevance of two different types of non-GAAP metrics, operating income disclosed in a firm's earnings release—as measured by the Thomson Financial I/B/E/S data and the EPS from operations obtained from 10-Q and 10-K filings—some scholars find that the former is more value-relevant than the latter (Brown and Sivakumar 2003). Similarly, incremental value and forecasting relevance tests on the management-specific adjustments suggest that the majority of adjustments reflect appropriate classification of earnings components by insiders (Choi et al. 2007). However, investors do not fully appreciate the lower cash flow implications of earnings adjustments at the time of the earnings announcement. Indeed, a trading strategy based on the excluded expenses yields a large positive abnormal return in the years following the announcement, and persists after controlling for various risk factors and other anomalies (Doyle et al. 2003).

#### 4.1.4 Meet or beat

While prior research during this period investigates the extent to which managers report adjusted numbers to better reflect core earnings, a minority of studies emphasizes that managers might use earnings adjustments to meet strategic earnings targets on a pro forma basis when they fall short based on GAAP reporting standards. In particular, the exclusion of recurring items (e.g. depreciation, research and development, and stock-based compensation) to meet strategic targets is especially indicative of aggressive pro forma reporting, and the phenomenon is more frequent among firms that report adjusted earnings only sporadically rather than on a regular basis (Black and Christensen 2009). In other cases, managers opportunistically shift expenses from core (cost of goods sold and selling, general and administrative expenses) to special items, and this vertical movement does not change bottom-line earnings, but overstates core earnings. Moreover, the reclassification shifting allows the analyst forecast earnings benchmark to be met, as special items tend to be excluded from both pro forma and analyst earnings definitions (McVay 2006).

#### 4.1.5 Corporate governance and other characteristics

Research in this period takes into consideration the underlying characteristics that bring firms to disclose pro forma earnings. Relying on a sample of press releases from 1997 to 1999, scholars find that low GAAP earnings' informativeness and the direction of GAAP earnings' surprises are important determinants of pro forma reporting (Lougee and Marquardt 2004). In addition, industry guidelines on non-GAAP performance decrease managerial discretion, increase the uniformity and improve the transparency of a non-GAAP performance measure (Baik et al. 2008).

### 4.2 Second period 2010–2014: The regulation of non-GAAP reporting

During the period 2010–2014, there has been intense regulatory activity, which started in the US and spread with several national and international interventions all over the world. The regulatory effort was particularly fervent in the US, where a

series of regulations and guidelines followed from 2001 to 2010, with final updates in 2016. Outside the US, the Australian Securities and Investments Commission (ASIC) issued the 'Regulatory Guide 230: Disclosing Non-IFRS Financial Information' in 2011, and the Financial Markets Authority (FMA) in New Zealand published the 'Guidance Note' in 2013. In addition, from 2005 to 2016, supranational bodies such as the European Securities and Markets Authority (ESMA), the International Accounting Standards Board (IASB) and the International Organization of Securities Commission (IOSCO) devoted attention to the discipline of non-GAAP reporting.

In line with this fervent regulatory activity, our literature review highlights that during the second period, the most explored topic is the use of non-GAAP metrics according to the changes in the prescriptions of regulatory bodies.

The second most prolific area of research points out that corporate governance and other internal and external mechanisms play a role in firms' decision to disclose pro forma metrics. The third most examined topic investigates the usefulness and relevance of non-GAAP indicators for external users of financial statements.

Studies in this period show that there has been an increasing use of non-GAAP indicators with the opportunistic purpose of providing a better picture of the firm performance, even though informativeness remains the prevailing aim.

#### 4.2.1 Regulation

Since the issuance of Cautionary Advice in 2001, scholars have taken advantage of the large amount of longitudinal data to enlarge the sample size and gather more robust evidence on the effect of the strict regulations for non-GAAP disclosure.

Using a large sample of quarterly earnings press releases ranging from 1998 to 2006, a first study in this period explores whether investor perceptions of pro forma earnings changed following the SOX. In the post-SOX period, the quality of pro forma reporting improves and investors appear to consider the disclosures more credible (Black et al. 2012).

Other studies question whether Regulation G is effective in limiting the tendency of managers to exclude recurring items from street earnings to meet or beat analysts' forecasts. Empirical results show that the meet or beat forecast exclusions are more persistent in the period prior to the implementation of Regulation G, suggesting that the SEC intervention constrained the opportunistic exclusion of items from pro forma metrics (Chen 2010). More specifically, managers tend to report the existence of transitory gains but are less prone to adopt a non-GAAP metric that excludes them. The tendency is instead to exclude only transitory losses to improve performance and present a positive image of the firm, even in the post-Regulation G era (Baumker et al. 2014).

As Regulation G requires all companies to quantitatively reconcile pro forma earnings with GAAP earnings, some scholars analyse the impact of reconciliations on the mispricing of pro forma earnings. In particular, prior to Regulation G, the mispricing of pro forma earnings is limited to firms with low reconciliation quality, while there is no evidence of mispricing for firms with high reconciliation quality. There is a cross-Regulation G reduction of mispricing for firms whose reconciliation

quality improves, and there is no mispricing for firms that have high reconciliation quality. Finally, there is no evidence of mispricing after Regulation G (Zhang and Zheng 2011).

During the same period, scholars' attention has also grown in non-US settings following the prescriptions issued by local regulatory authorities.

A first case study on the five largest Australian banks (the Australian and New Zealand Banking Group, the ANZ, the Commonwealth Bank, the National Australian Bank, Westpac) reveals that, after the transition to Australian International Reporting Standards, there has been an increase in the number of adjustments between GAAP and non-GAAP earnings, assuming that the definition of GAAP earnings is less representative of the underlying periodic performance than the pro forma measure (Sek and Taylor 2011). Similarly, an investigation of the top 50 Australian public non-mining companies suggests that managers engage in a form of manipulation by emphasizing the earning measure that presents the company's financial performance in the best light (Cameron et al. 2012).

While studies on the regulation were evolving, bringing to light that there was still some space for opportunism, some scholars pointed out that some corporate governance characteristics could be useful to promote the informative role of non-GAAP disclosure. In this perspective, examination of the joint effect of SEC intervention and corporate governance (measured by the percentage of external board directors and the percentage of shares held by institutional investors) reveals that the presence of strong corporate governance limits the misleading use of non-GAAP measures regardless of the regulation. In contrast, in firms with weak corporate governance, investors are only misled by non-GAAP adjustments before the SEC intervention (Jennings and Marques 2011). When specifically analysing the role of the auditor, a similar study finds that prior to the introduction of SOX, the optimistic disclosure of non-GAAP earnings is associated with higher audit fees and a greater tendency for auditors to resign. Furthermore, additional analyses show that in the post-SOX period auditors are more concerned about the implications of opportunistic reporting of non-GAAP earnings disclosures (Chen et al. 2012).

#### 4.2.2 Corporate governance and other gatekeepers

Studies conducted during the second period also investigate the effective functioning of formal corporate governance mechanisms, such as board of directors, audit committees and managerial incentives with the aim of constraining the managerial opportunism, which is of concern to investors and accounting standard setters.

With particular reference to the internal audit, the appointment of accounting experts, as required by the SEC, improves the efficacy of audit committee performance. Indeed, their involvement reduces the quantity and increases the quality of non-GAAP earnings exclusions, assuming that the non-recurring items are higher quality as they are not related to future income (Seetharaman et al. 2014). Further investigation of US companies shows that when the board is composed of a small percentage of independent directors, the non-GAAP earnings exclusions are negatively correlated to future earnings, thus suggesting that non-GAAP reporting reflects opportunism rather than the economics of the firm (Frankel et al. 2011).

Moreover, non-GAAP performance measures are related to board ownership and board independence in Canadian companies and are relevant for investors to value real estate investment trusts. Beyond the structure and the composition of the board and its sub-committees, attention has been devoted to the managerial incentive as an explanatory factor of the use of pro forma indicators. Indeed, stock option holdings granted to managers and directors affect the use of pro forma indicators, warning the accounting standard setters about the need to closely monitor the managerial opportunistic use of such measures by boards and regulators (Cormier et al. 2011).

Additional evidence on the mandatory recognition of stock-based compensation expenses under the SFAS 123R suggests that managers opportunistically exclude stock compensation from pro forma earnings in order to increase or smooth earnings and meet earnings benchmarks (Barth et al. 2012).

Other disciplining factors that act as gatekeepers for non-GAAP reporting choices are the media attention and the level of investor sentiment. In particular, it is noted that after the peak of negative media attention, the number of recurring item adjustments made by Dutch companies has greatly reduced. Investors seem to take the warnings of the media seriously, even without regulatory changes (Koning et al. 2010). In addition, investor sentiment is able to influence managers' discretionary disclosure of pro forma earnings metrics. In particular, as investor sentiment increases, managers opportunistically exclude higher levels of both recurring and nonrecurring expenses in calculating the pro forma earnings number, and emphasize the pro forma figure by placing it more prominently within the earnings press release (Brown et al. 2012b).

### 4.2.3 Reporting quality

Although the development of studies on reporting quality was still at an early stage, scholars during the second period have continued to explore the value relevance of non-GAAP disclosure in settings experiencing a shift towards mandatory employment of non-GAAP metrics. Indeed, with the S&P request for a uniform metric of core earnings in 2002 and the subsequent implementation of FASB 123R in 2004, a value relevance test conducted using stock price and return data reveals that core earnings are more value relevant than GAAP earnings in the pre-period after controlling for stock option expenses, and in the post-FASB 123R period. The result suggests that a uniformly calculated earnings measure is a more useful indicator of current and future earnings (Wieland et al. 2013). Similarly, in the context of South Africa, the mandatory regime of the non-GAAP reporting implies that non-GAAP earnings have higher value relevance than GAAP earnings (Venter et al. 2014).

Spreading beyond the borders of the value relevance, other scholars investigate the relationship between the timing of earnings announcements that contain an adjusted earnings measure and the quality of reported earnings. On average, managers accelerate the timing of earnings announcements when they disclose adjusted earnings metrics within the earnings press release.

The acceleration of the earnings announcement increases with the exclusion of recurring expenses and the use of less transparent reconciliation formats. Consistent with managerial opportunism, the recurring item exclusions used to calculate pro



forma earnings in accelerated earnings announcements are of relatively low quality and are more predictive of lower future earnings (Brown et al. 2012a).

#### 4.2.4 Market effect

Market effect studies on non-GAAP disclosure investigate market reactions to the use of pro forma metrics (Hsu and Kross 2011), finding that non-sophisticated investors rely more on non-GAAP than on GAAP earnings (Johnson et al. 2014) and that informed market participants exploit the information asymmetries created by non-GAAP metrics by trading more frequently around earnings announcements that include pro forma earnings disclosures (Christensen et al. 2014).

#### 4.2.5 Meet or beat

Analysis of the meet or beat behaviour shows a link between pro forma earnings reporting and the benchmark beaters (Doyle et al. 2013), as firms explicitly disclose non-GAAP earnings—excluding expenses but including transitory gains—when it allows them to meet earnings benchmarks (Curtis et al. 2014).

### 4.3 Third period 2015–2019: The quality of Non-GAAP disclosure

Given the increasing availability of non-GAAP indicators, as required by the huge number of regulatory prescriptions, our literature review reveals that during the third period the most explored topic is related to the examination of whether this information is relevant, timely, persistent and predictive of future performance, also taking into account the need to provide more accurate information during financial turmoil. This analysis not only involves the non-GAAP metrics provided within the financial statements, but also extends to the footnotes and to other non-GAAP non-financial indicators. The second most investigated topic is related to regulation. Dealing with this topic, scholars examine the motivations behind the use of non-GAAP metrics, especially during the period in which regulation has been fully implemented. The impact of non-GAAP reporting on the capital market participants appears to be the third most investigated topic. Studies on corporate governance focus on formal mechanisms and extend the investigation to additional firm-specific and institutional characteristics.

Collectively, these studies highlight that the harsher discipline in the presentation of non-GAAP metrics has been beneficial for investors, and has increased the propensity to employ pro forma disclosure with the purpose of providing more useful information to outside stakeholders compared to the second period.

Finally, the investigated settings comprise the US, Canada, Europe, Australia, New Zealand and South Africa.

#### 4.3.1 Reporting quality

Investigation of the value relevance connected to the enactment of IFRS in Canada finds an attenuated need for non-GAAP measures' disclosure and an

enhancement of the value relevance of information contained in footnotes (Cormier and Magnan 2016). Additional research in the specific setting of Korean banks finds an incremental value relevance of non-GAAP book values adjustment over unadjusted book values of equity, while failing to find incremental value relevance over unadjusted IFRS net income (Kim and Yoon 2019).

Value relevance is also explored as an effect of the implementation of the IASB requirements for the non-GAAP reporting of EBIT and EBITDA, aimed at improving the relevance of financial information of Australian firms. Relying on both archival data and field interviews, it has been found that EBIT and EBITDA are more value relevant than statutory measures (Davern et al. 2019).

The effect of EBITDA disclosure is analysed with the purpose of assessing whether it affects the value relevance and the predictive ability of earnings. Evidence shows that there is a positive relationship between earnings and stock prices, as well as future cash flows, for Canadian companies (Cormier et al. 2017).

The importance of non-GAAP disclosure is strengthened by the results emerging for New Zealand firms across the global financial crisis. In this setting, adjusted earnings prove to be better predictors of future earnings and provide more value-relevant information to the market than GAAP earnings (Rainsbury et al. 2015).

The examination of whether pro forma earnings forecast future cash flows better than IFRS earnings for Australian companies provides similar results.

In fact, non-IFRS earnings exert a significantly positive impact on future cash flow predictability, but only during pre-crisis and crisis periods, whilst non-GAAP adjustments have the potential to mislead investors in the post-crisis period (Sinnewe et al. 2017).

The reporting quality in terms of value relevance and predictive ability has been also tested with reference to non-GAAP non-financial metrics. In particular, the value of customer equity, a non-GAAP metric especially important for subscription-based enterprises, is positively and significantly associated with the market value of the firm, as well as with future earnings (Bonacchi et al. 2015).

When comparing the incremental information in the disclosures of non-GAAP earnings of loss and profit firms, findings highlight that non-GAAP disclosures are particularly predictive of future performance and potentially less strategic for loss firms than for profit firms. Nonetheless, the GAAP earnings of firms that exclude expenses to convert a GAAP loss into a non-GAAP profit (the so-called loss converters) are not related to future performance (Leung and Veenman 2018).

More recently, the examination of non-GAAP reporting quality has moved beyond the boundaries of value relevance and predictive ability to explore multiple attributes such as persistence, smoothness, conservatism and timeliness. On average, it has been discovered that non-GAAP earnings are more persistent, smoother, more value relevant and have higher predictive power than their closest GAAP equivalent. However, they are less conservative and less timely than their nearest GAAP counterpart (Ribeiro et al. 2019).

### 4.3.2 Regulation

During the third period, scholars investigating the effect of regulation on non-GAAP reporting provide evidence of a progressively increasing use of pro forma for informative purposes. Accordingly, a less opportunistic use of pro forma indicators has been acknowledged for the US cross-listed firms that prepare financial statements under IFRS (Solsma and Wilder 2015). What is more, US firms with a greater tendency to issue non-GAAP disclosures to mislead investors and those receiving SEC comment letters questioning the use of non-GAAP disclosures have even been found to stop non-GAAP reporting in the post-scrutiny period (Lee and Chu 2016).

Nevertheless, there is also evidence suggesting that managers exclude some recurring items in the reconciliation table required by Regulation G to manipulate non-GAAP earnings. In fact, CEOs who sell their holdings after the earnings announcement are more likely to disclose non-GAAP earnings in order to gain private benefits, even after the SEC intervention (Shiah-Hou and Teng 2016). Similarly, other studies uncover that although the introduction of SOX and Regulation G achieved the intended purpose, a number of firms still appear to endorse aggressive non-GAAP exclusions (Black et al. 2017b). More recently, results of an analysis on the use of non-GAAP reporting after Regulation G definitely show that non-GAAP exclusions are more transitory and therefore of higher quality (Bond et al. 2017). The use of non-GAAP reporting with an informative aim is also confirmed for New Zealand and Australian firms. In particular, despite their non-mandatory nature, the Guidance Note issued by the FMA in 2012 improves both the quality of non-GAAP disclosures and the significance of non-GAAP earnings in New Zealand firms (Rainsbury 2017). Furthermore, the Regulatory Guide 230, issued by the ASIC in 2011, induces Australian firms to use non-GAAP metrics to provide additional information to shareholders (Yang and Abeysekera 2018).

### 4.3.3 Market effect

During the third period, scholars bring the investigation of the market effect of pro forma disclosure up to date, enlarging the range of the analysis to other capital market participants. For instance, the management's awareness of intensified monitoring by outside stakeholders brings them to report non-GAAP EPS in a less opportunistic manner. Therefore, the conclusion is that non-GAAP reporting mitigates information asymmetry between the management and outside users (Choi 2015). Specifically, information asymmetry in the preannouncement period is positively associated with the probability of non-GAAP earnings in the quarterly earnings announcement. Moreover, the reduction in information asymmetry after earnings announcements is significantly more pronounced when analysts or managers issue non-GAAP earnings (Huang and Skantz 2016).

Scholars that focus on the investor reaction find that professional investors are able to recognize the opportunistic behaviour of managers and discount non-GAAP information that is accompanied by high impression management. Moreover, investors in more sophisticated markets penalize non-GAAP measures communicated with high impression management (Guillamon-Saorin et al. 2017). When

investigating the format for the presentation of non-GAAP disclosure which investors rely on, a comparison between the full non-GAAP income statement (NGIS) and a summary NGIS—containing only those items that cause the difference between GAAP and non-GAAP measures—reveals that the NGIS summary format increases the weight given to non-GAAP earnings performance for investors' decision-making process (Hogan et al. 2017).

Evidence from Australian companies confirms the usefulness of non-GAAP reporting for investors (Yang 2018) and other categories of outside stakeholder, such as analysts (Malone et al. 2016).

#### 4.3.4 Corporate governance and other characteristics

In the third period, studies on factors driving pro forma reporting choices are not confined to the examination of formal corporate governance mechanisms. In particular, using a dataset of UK firms during the period 2006–2013, it has been shown that better governed firms and firms with weaker financial performance are more likely to disclose non-GAAP earnings with the incentive to provide information than to mislead the market (Charitou et al. 2018).

When considering the adoption of voluntary clawback on executive compensation as a disciplining governance mechanism, it is found that opportunistically motivated managers shift their focus from GAAP to non-GAAP earnings by increasing non-GAAP earnings disclosure frequency and decreasing the quality of non-GAAP exclusion. This is due to the increased cost of manipulating GAAP earnings after clawback adoption (Kyung et al. 2019).

Other studies extend the investigation to additional firm-specific characteristics. Debt financing, corporate governance, operating performance, earnings volatility, industry membership (such as technology and research and development intensity) and complexity of operations (number of segments) determine managements' incentives to disclose GAAP-compliant versus non-GAAP financials with their earnings releases (D'Angelo et al. 2018).

Relying on a textual analysis of the use of EBITDA in financial disclosures based on a large sample of S&P 1500 firms between 2005 and 2016, scholars underline that smaller, leveraged, capital intensive, less profitable firms and those with longer operating cycles opportunistically use EBITDA disclosures to paint a rosy picture of profitability and cash-generating ability (Bouwens et al. 2019).

Institutional and market forces also play a role in non-GAAP reporting. Efficient laws and enforcement, strong investor protection, developed financial markets, and good communication and dissemination of information reduce the opportunity to manipulate GAAP earnings, and hence lead firms to use non-GAAP measures intensively to meet or beat earnings benchmarks that GAAP earnings would miss (Isidro and Marques 2015).

#### 4.3.5 Meet or beat

Ultimately, the strand of research which focuses on the use of non-GAAP reporting to meet or beat strategic targets also confirms the greater managerial propensity to

exclude recurring (Bentley et al. 2018; Black et al. 2017a) or non-recurring items (Bradshaw et al. 2018; Choi and Young 2015) outside the US and Europe (Howard et al. 2019).

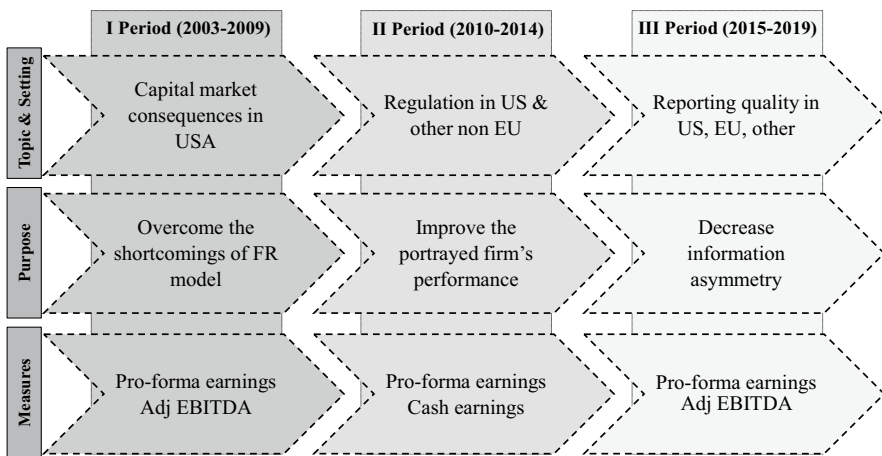
**4.3.6 Real effect**

It is worth considering that in this period a new topic of research investigating the real effect of non-GAAP disclosure has emerged. For instance, a recent study suggests that managers who report EBITDA overinvest in capital and overleverage their firm relative to their industry peers (Rozenbaum 2019).

**4.4 Framework for the literature review**

Following discussion of the findings, Fig. 3 frames the evolution of the research field on non-GAAP reporting over the three research periods.

The evolution of the topics and the settings reflects the widespread use of non-GAAP indicators regardless of sector. With reference to the perspective of analysis and the categories of stakeholder involved, findings reveal that this strand of research has been investigated considering both the ex-ante determinants and the ex-post consequences under different stakeholder perspectives. In particular, in the first and the third periods, the attention of the scholars is mainly devoted to the effects of non-GAAP disclosure for the financial reporting users, while in the second period, the research is almost exclusively concentrated on the incentives for the preparers of the financial statement to constrain the opportunistic employment of the pro forma disclosure. Coherent with the development of the research topics, the purpose of non-GAAP reporting has evolved over time. While the informative purpose of non-GAAP measures prevails during each of the three periods, the increasingly opportunistic role of such metrics during the second period shifted scholars' attention



**Fig. 3** The evolution of the literature on non-GAAP reporting

from the market consequences to the determinants of non-GAAP reporting in terms of regulation. In line with this picture, the evolution of non-GAAP metrics reflects the use of cash earnings in order to constrain the opportunistic non-GAAP disclosures in the second period.

With the aim of corroborating the emerging picture, Fig. 4 provides a graphical illustration of the reviewed articles according to the informative or opportunistic purpose of non-GAAP disclosure.

## 5 Corporate governance avenues for future research on non-GAAP disclosure

The paper highlights the importance of corporate governance principles, since several monitoring mechanisms, such as independent boards, analysts, creditors and short sellers, play a role in disciplining managers' non-GAAP reporting practices. Moreover, standard setting regulation has generally resulted in higher quality non-GAAP disclosures and has been employed to ensure that pro forma disclosure is used with an informative rather than an opportunistic purpose. However, as a finding of our literature review, corporate governance has never resulted as the first investigated topic and there still exists additional room for research on non-GAAP from a corporate governance lens.

A first drawback of this line of research is that it has examined only one facet of governance, being board independence, neglecting additional characteristics of board demography and functioning. Further research might explore these additional board features, also in conjunction with other corporate governance constructs. Indeed, future studies might be able to shed light on the above-mentioned topics by jointly analysing the ex-ante corporate governance determinants and the ex-post consequences of non-GAAP reporting, adopting a complete-path

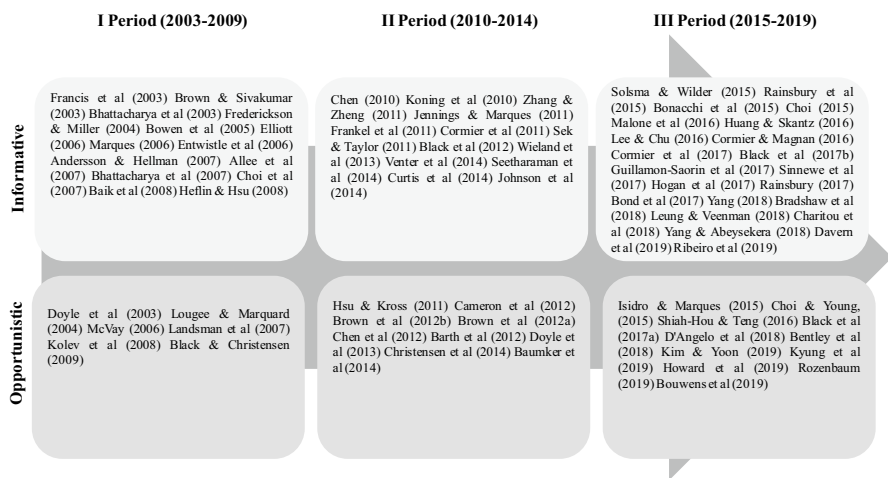


Fig. 4 The purpose of non-GAAP disclosure

approach. In this perspective, there is a general consensus on the fact that stakeholders rely on audit committees to help safeguard the integrity of the financial reporting process. However, relatively little is known about how well audit committees perform their oversight and review functions, especially with respect to a company's non-GAAP information. Future research could look into the desirable attributes that could potentially affect the functioning of the audit committees, such as industry experience, diversity of thought, ability to work cohesively in small groups, and ability to respect and work well with others.

Other papers could ask the question of why firms choose non-GAAP numbers in relation to compensation and debt contracts. For instance, it would be interesting to assess whether non-GAAP disclosure is influenced by the performance indicators used by companies in their compensation schemes. Moreover, in debt covenants, scholars agree that EBITDA plays almost a primary role. Upcoming works could enhance the current understanding of why firms benefit if they contract on EBITDA numbers instead of GAAP numbers.

Additional research might also consider the importance of soft managerial skills such as corporate values and culture. Particular attention could be given to how the spreading of ethical, moral and entrepreneurial values, which foster the creation and development of a sustainability-oriented corporate culture, affects non-opportunistic use of non-GAAP disclosure. Another strand of study could analyse the benefits deriving from the adoption and implementation of integrated reporting for investors and other stakeholders. For instance, scholars might consider the inclusion of non-financial non-GAAP indicators related to corporate governance disclosure (e.g. the presence of women, young members and directors with different backgrounds or diversified skills) in the broader perspective of corporate social responsibility.

Another line of research could explore how external auditors could contribute to increasing stakeholders' confidence in non-GAAP reporting. Future research might address this question, analysing the contingent factors that explain the external auditor's involvement in the process of assurance of non-GAAP indicators and the extent to which this engagement results in a different balance of responsibility between external and internal audit procedures over alternative performance measures. It would also be interesting to probe whether the enhanced involvement of an external auditor increases the relevance and the reliability of financial communication. This, in turn, implies additional harmonization on how non-GAAP performance measures should be computed and presented, and a broader consensus on how these metrics should be audited. This line of research interacts with the need to explore the call for standardization of non-GAAP reporting further with the aim of improving the comparability, reliability and comprehensibility of financial information disclosed to the market, bearing in mind the balance between the benefits of mandating additional disclosures and the inherent costs.

Forthcoming non-GAAP studies could also analyse the main theoretical and practical implications of the supposed inadequacy of the current financial reporting standards for digital companies operating with new business models in the fourth industrial revolution. Another fruitful avenue for future studies could be an analysis of the consequences of the inevitable shift to digital services for all the traditional

economies (smart working, e-learning, smart tourism) in periods of social turmoil, such as the ongoing COVID-19 pandemic.

A different line of research could be devoted to the investigation of how cross-country differences in legal systems, investor protection and communication channels influence the usefulness of pro forma disclosure in small and private firms, or in settings where there is no regulation of non-GAAP voluntary disclosure, such as the European context. In such circumstances, institutional and economic factors play an important role in influencing managers' voluntary disclosure decisions, beyond other firm-specific incentives.

Finally, scholars might reassess the findings of the existing literature on the subject by combining multivariate regression models with alternative research methods, such as experimental approaches or case studies.

Figure 5 provides a synthesis of the underexplored corporate governance research areas that need further investigation as a result of our systematic literature review.

## 6 Conclusion

The disclosure of pro forma indicators has been extensively debated in the academic and professional arenas, and has attracted the attention of scholars, regulators and standard setters. Managers and other advocates of pro forma reporting argue that these disclosures supplement GAAP financial presentations, providing a clearer

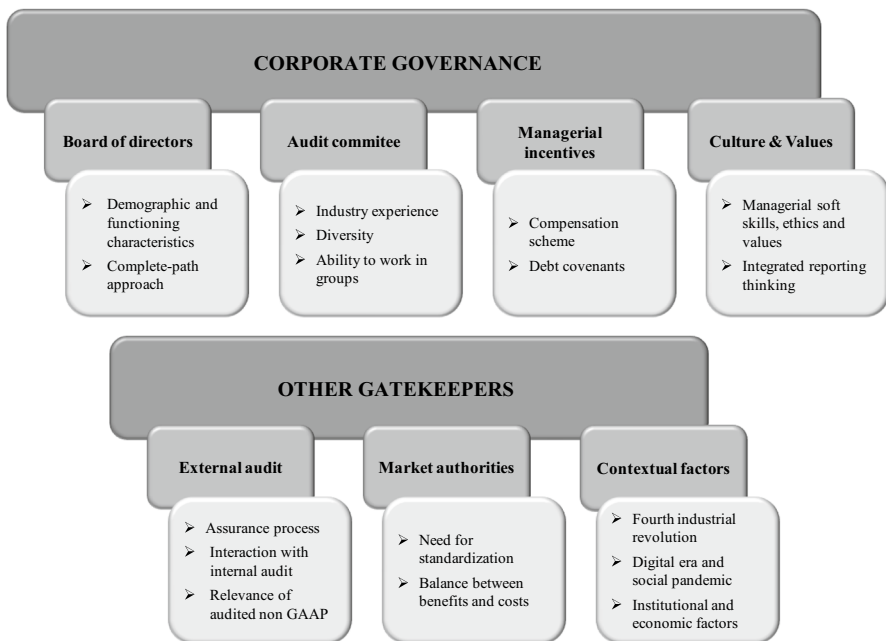


Fig. 5 Avenues for future research



picture of companies' core earnings. On the other hand, regulators, policymakers and the financial press often allege that pro forma earnings are opportunistic attempts to mislead investors. Empirical evidence suggests that while many non-GAAP disclosures are informative, some may represent managers' attempts to portray an overly optimistic financial performance.

The present literature review has set the objective of systematizing this research field, highlighting how the main research topics, the investigated settings, the purpose and the type of non-GAAP measures have evolved over three distinct research periods.

The paper contributes to the extant literature in several ways. Firstly, our review of the literature is worthwhile as it depicts the evolution of the existing literature on non-GAAP reporting, providing insights into the lessons learned after nearly two decades of research on this reporting practice. In detail, academics in the first period analysing the capital market consequences in the US learned that pro forma earnings and adjusted EBITDA mainly serve the purpose of overcoming the shortcomings of the traditional financial reporting model. Scholars in the second period focusing on the effectiveness of the emerging regulation on non-GAAP disclosure learned that the increasing use of pro forma earnings and cash earnings reflects the managerial attempt to provide a better picture of the firm performance. Finally, researchers in the third period evaluating the reporting quality learned that regulation has generally resulted in higher quality non-GAAP disclosures, since pro forma earnings and operating earnings are mostly relevant, timely, persistent and predictive of future performance.

Secondly, the paper highlights the increasing role played by corporate governance in non-GAAP research findings in the three periods. Specifically, in the first period, scholars' attention was exclusively devoted to the monitoring role of financial reporting transparency and industry guidelines. In the second period, we observe an enlarged role of internal corporate governance mechanisms, such as the accounting expertise of the audit committee, board ownership and independence, and the incentive effect of stock-based compensation. In addition, external monitoring provided by the attention of the media and press, as well as the investor sentiment for pro forma disclosure decisions, are important determinants of non-GAAP disclosure. In the third period, scholars' understanding of the disciplining role of corporate governance extends to a wide range of firm-specific characteristics and formal governance mechanisms, either internal or external.

Ultimately, our literature review details the current role of non-GAAP reporting and enables evidence-based management. In this perspective, it facilitates managerial decisions and institutional practices informed by the best available evidence.

Despite these insightful results, this paper suffers from some limitations related to method and the data used in our literature review. Firstly, in order to avoid language bias, we selected search strings in English. A literature search in other languages might have resulted in another distribution of authors' affiliation and geographical origin, and perhaps a different distribution across the three periods. Secondly, we had to restrict the search to some internationally well-known databases and to specific categories, but various publications in other areas might add to the debate on non-GAAP reporting. Other limitations are related to the

appropriateness of the selection/exclusion criteria. Although we had clear rules on whether a publication could be included or not, the decision on each publication is accompanied by a subjective assessment. Finally, we did not include publications if they only mentioned non-GAAP reporting, or if it was merely considered as part of a broader topic.

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