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Article — Published Version

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Journal of Corporate Accounting & Finance

Provided in Cooperation with:

John Wiley & Sons

Suggested Citation: Wiek, Marcel; Eichner, Korbinian (2023) : Adjusted versus unadjusted earnings: An empirical analysis of pro forma adjustments in large German public companies, Journal of Corporate Accounting & Finance, ISSN 1097-0053, Wiley, Hoboken, NJ, Vol. 34, Iss. 3, pp. 47-63,
<https://doi.org/10.1002/jcaf.22611>

This Version is available at:

<https://hdl.handle.net/10419/288032>

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RESEARCH ARTICLE

Adjusted versus unadjusted earnings: An empirical analysis of pro forma adjustments in large German public companies

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Abstract

This article analyzes non-GAAP, pro forma earnings metrics of large German publicly traded companies to better understand their usage and relevance in practice. We base our analysis on a hand collected data set compiled from annual reports. Almost all companies in our data set use pro forma earnings. Typically, legal, restructuring, acquisition and accounting related costs get adjusted. EBIT, EBITDA, EPS and Net income are the most frequently adjusted earnings metrics. In almost all observed cases, pro forma earnings are higher than their underlying GAAP earnings. Our study addresses the challenge of investors to understand a company's "true" operating performance. Only when one understands the historically observable financial performance, one can make better predictions of its recurring, future financial performance. The article adds to the existing literature by analyzing in which part of the annual report pro forma earnings are typically disclosed, how transparent they are presented and reconciled, and what impact adjustments have compared to the unadjusted GAAP earnings.

KEYWORDS

asymmetric information, corporate finance, corporate valuation, financial reporting, market approach

1 | INTRODUCTION

When analyzing financial publications of public companies, one frequently encounters financial performance measures like "EBIT before special items," "Underlying EBITDA," or "Core EPS." These so-called pro forma earnings, also referred to as "non-GAAP" metrics, are derived from company specific adjustments on accounting compliant earnings metrics. These adjustments are intended to eliminate one-time and/or extraordinary income and expense items which the reporting entity does not consider to be a reflection of its financial performance.

Pro forma earnings metrics can be used by financial analysts to better estimate the "true" operating performance of a company. One can argue that certain line items within the annual reports, in particular non-cash and non-recurring items, are not as relevant when it comes to determining the performance of a given company.¹ Furthermore, it can be proposed that pro forma metrics reflect the managerial intentions to for one reduce reporting complexity along with providing additional useful information for estimating future cash-flow.² One can take the continuous use and increase in pro forma metrics over the past 20 years as a general approval in the

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usefulness of non-GAAP metrics to assess the performance of a company.³

However, in a more critical manner pro forma earnings are also referred to as “street earnings,”⁴ “Everything but Bad Stuff,”⁵ and “Earnings before Bad Stuff.”⁶ This is since the decision and freedom of adjusting earnings is largely a managerial decision. They can potentially choose to mislead investors by excluding certain line items and negative effects of reported earnings metrics. This has the possibility to increase future company expectancies. Additionally, the fact that pro forma earnings are shown dynamically next to, under or above GAAP earnings, has the potential to reduce the comparability as well as the transparency of the given accounting information.⁷ Furthermore, can and do managers exclude recurring expenses which are part of the core business like, for example, stock based remuneration.⁸

With the available degree of freedom when it comes to pro forma metrics in annual reports, regulators have voiced concerns. In the US as early as in 2002, with the Sarbanes-Oxley act, the SEC mandated action. Companies within the US capital market, therefore, must reconcile their pro forma earnings to the GAAP earnings.⁹ Similarly to the SEC, the CESR issued recommendations for the usage of pro forma metrics as early as in 2005.¹⁰ Since then, and in particular with the adoption of the IFRS in 2005 for parent companies within Europe that trade on a regulatory market,¹¹ the IASB continuously issued recommendations and standards for the use of pro forma metrics.¹²

The main objective of this research paper is to find out how widespread the usage of pro forma earnings in large German public companies is. Furthermore, the data of this research shows where pro forma earnings are found in annual reports of publicly traded companies in Germany, how and in which detail these pro forma measures are explained, what verbiage is used to indicate pro forma earnings and whether pro forma earnings tend to be an increase or decrease in value compared to their GAAP earnings counterpart. To achieve this goal current annual group reports from companies in the German DAX stock index as well as the German MDAX index from the year 2020 are analyzed. The insights are then presented and furthermore compared to studies already concluded. The purpose of the comparison is to show the change due to differences in geographical location, the change of annual group report practices owing to time as well as contrasting the usage of pro forma metrics in comparison to other reporting measures, such as earnings before metrics.

Chapter one provides an introduction into the topic of pro forma earnings metrics. Chapter two focusses on the theoretical background of what pro forma earnings metrics are and includes a delimitation to the similar met-

ric “earnings before.” Besides, key reasons for companies reporting pro forma earnings metrics are outlined. Chapter three presents an overview of existing research on the topic. Chapter four outlines our empirical data and its analysis. First, the core research questions are highlighted. Besides, the data collection process is presented. In addition, the data sample size and its components are discussed. Consecutively the results for pro forma metrics in large German public companies in 2020 is presented. This includes the number of pro forma metrics used as well as the percentage of companies using pro forma earnings. Furthermore, qualitative details on the location of pro forma earnings metrics in the annual reports, as well as how company name and reconcile them are presented. Additionally, the nature of the earnings adjustments is presented and analyzed. Lastly, we provide information on the relative increase and decrease of GAAP earnings to non-GAAP earnings, as well as further details as to whether these adjustments are usually positive or negative in nature. We conclude by providing information on the limitations of our results. A summary of our results and an outlook for further research on the topic is part of the conclusion in chapter five.

2 | FUNDAMENTALS OF PRO FORMA EARNINGS

2.1 | Definition

The term “pro forma” originates from Latin and translates to “for form.” With the absence of a uniform and official definition, pro forma earnings are usually described as metrics which adjust or modify the bottom-line earnings of an income statement.¹³ Companies take a GAAP compliant earnings metric as the basis and exclude certain line items. As such pro forma earnings metrics are most of the time indicated with the word “adjusted” within earnings publications of companies.¹⁴ Literature furthermore uses a variety of synonyms to describe pro forma metrics, in particular alternative profitability measures¹⁵ and the previously mentioned “non-GAAP” as well as “adjusted GAAP” terminologies.¹⁶ The terms pro forma, pro forma earnings, pro forma metrics as well as pro forma earnings metrics for the purpose of this paper are synonyms to the previously described terms and therefore can be and are used interchangeably.

In comparison to pro forma metrics, “earnings before” metrics describe interim results of the profit and loss statement within annual reports of companies. These results come in a variety of ways. Typically, they exclude line items in a GAAP conformant manner.¹⁷ EBIT (Earnings *before* interest and taxes) and EBITDA (Earnings *before* interest,

taxes, depreciation and amortization) are according to a recent study the most used earnings before metrics.¹⁸

In our analyses, earnings before metrics will be mentioned and considered separately from pro forma or non-GAAP metrics. This is important to note due to the fact that particularly in German literature earnings before values were considered pro forma.¹⁹ However, usually a differentiation between adjusted and not-adjusted earnings before metrics did take place by calling earnings before metrics broad-form pro forma and adjusted earnings before metrics narrow-form pro forma.²⁰ The narrow-form pro forma metrics of that approach can be compared to pro forma metrics described in this paper and the broad-form pro forma metrics are comparable to earnings before metrics within the data outlined in chapter 4.

2.2 | Intention and purpose of pro forma earnings

Annual reports serve two key purposes. For one they capture financial performance during a given period, and two, they are the foundation upon which future performance can be predicted. Depending on the economic circumstances of a company, historical financial statements can include both operating and recurring, as well as non-operating and non-recurring line items. If the latter occurs, it can become challenging when one tries to project future financial performance on the basis of this information. Whilst both groups of income statement line items are necessary to describe what happened within the reporting period,²¹ their relevance for projecting future financial performance is substantially different. Consequently, an interest in excluding certain items in financial statements is created.

The main, outspoken purpose of pro forma adjustments is therefore to compute metrics which are seen as more informative for the company's future performance. That is also the reason as to why frequently GAAP earnings are adjusted for certain non-cash line items which are supposed to bring the bottom-line result closer to so called recurring cash earnings and subsequently offering a better view on true financial performance.²²

However, due to the nature of non-GAAP earnings being flexible to some degree, company executives can exercise partly discretion on how pro forma metrics are computed. This could lead to differences in the definition of certain key financials (like, e.g., adjusted EBIT) amongst firms operating in the same industry, making it difficult for investors and financial analysts comparing the financial performance of those firms. Issues might also arise with how and where non-GAAP earnings are reported in annual reports. Supposedly, companies could put partic-

ular emphasis on pro forma metrics over GAAP earnings. This can be done by using bold headlines or highlighting pro forma metrics in tables or text.²³ Specifically less-sophisticated investors react to the relative placement of GAAP versus non-GAAP earnings metrics. However, it is also shown that more sophisticated investors can be influenced by such a reporting practice.²⁴

The core issue or driver behind computing and disclosing pro forma earnings is grounded in information asymmetries between investors and managers. Discrepancy between the amount of information these two parties have could lead to negative effects for both.²⁵ As the managers of a company have more and better information available, they try to reduce information asymmetries by disclosing earnings which they adjust for effects that are not or entirely known to external stakeholders. Reducing existing information asymmetries could positively impact a company's share price or costs of funding. However, managers could also try to personally benefit from existing information asymmetries by excluding certain line items according to their own motivations thereby sending overly positive signals to the stock market leading to positive short-term stock price changes, potentially impacting their own personal wealth.²⁶

Due to this, one could argue that the disclosure of non-GAAP metrics can damage the integrity of financial reports. This is the case when, for example, the exclusion of certain expenses transforms a negative GAAP bottom line into a positive pro forma earnings metric.²⁷ Furthermore, if pro forma metrics are used as primary reporting tool, they can undermine the reliability and comparability of the entirety of the earnings report, by making it seem more profitable than it is.²⁸

3 | LITERATURE REVIEW AND RESEARCH GAP

3.1 | Overview on existing literature

Research on pro forma adjustments is still limited in number. This holds particularly true for research on firms located in German-speaking countries (DACH). We believe this has to do with the relatively time-consuming collection of data. Nevertheless, we were still able to identify three research studies that have addressed the issue of pro forma adjustments previously. These include the empirical analyses by Bassen et al. (2012), Hitz (2010), as well as Leibfried and Venzin (2014).

Hitz (2010) studied pro forma adjustments in 566 quarterly earnings publications and press releases of constituents of the German DAX and MDAX indices.²⁹ Between 2005 and 2006, Hitz identified a total of 201 pro

forma metrics. The amount of earnings before metrics amounted to 486. In comparison, the GAAP metrics totaled to 506. In Hitz's sample, the most used pro forma metric was "adjusted EBIT" with 85 findings (28.7%), followed by "adjusted net income" with 63 (21.3%) and "adjusted EBITDA" with 51 (17.2%). The companies within the sample size on average disclosed 1.54 pro forma adjustment.³⁰

The three most observable adjustment reasons were "restructuring" with 53 cases (21.1%), "M&A related" with 42 (16.7%) and "other" with 58 (23.1%). "Fall in value (write-offs)" was named 36 times (14.3%).³¹ Hitz showed that 73.1% of the time the pro forma adjustments were positive in nature. This means that the pro forma metric is in approx. three out of four times higher than the GAAP counterpart. Based on his sample, Hitz outlined that the average adjustment for companies within the MDAX index is 4.7% of total revenue in comparison to 2.3% for companies that are part of the DAX index.³² Hitz also analyzed the transparency of pro forma reporting in earnings press releases.³³ The findings show poor transparency. Only one-third of all earnings press releases showed full disclosure of the adjustment type.³⁴

Bassen et al. (2012) studied annual reports of public companies in the German-speaking area. The annual reports were retrieved from companies in the DAX, MDAX and STOXX Europe indexes, and covered the reporting periods 2006 until 2010. The sample included a total of 98 companies, reporting either under IFRS or US-GAAP.³⁵

In Bassen et al.'s sample, approximately two thirds of the companies (66% in 2006, 68% in 2007 and 67% in 2008) used pro forma earnings in their annual reports. These results implied that pro forma earnings were already an established concept as early as 2006. However, as for pro forma earning values reported, the number saw a sharp rise from 38 in 2006 to 48 in 2007 and 55 in 2008.³⁶ Bassen et al. showed that the number of companies reporting pro forma earnings varies between the DAX with 15 (58%) companies and both the MDAX with 32 (71%) as well as the STOXX Europe with 19 (70%).³⁷ The three most prominent reasons why companies in the sample used pro forma earnings metrics were "restructuring," "fall in value" (impairments, write-offs, depreciation) and "others."³⁸

Leibfried and Venzin (2014) based their empirical analyses on the annual reports of 47 large publicly traded companies in Switzerland, being constituents of the Swiss indexes SMI and SMIM.³⁹ More specifically, the authors analyzed the introductory part of the companies' annual reports. The authors focused exclusively on the annual reports of the reporting periods 2011 or 2010/2011.

Out of the 47 analyzed companies, 43 (91.49%) used pro forma or earnings before metrics in their annual reports. In total, 49 pro forma metrics were used. Furthermore, 48 earnings before metrics were part of the introductory pages

of the annual reports. The most used pro forma metrics were "adjusted EBIT" (36.37% of all pro forma metrics) and "adjusted EBITDA" (18.37%), respectively.⁴⁰ Leibfried and Venzin also studied the naming of pro forma earnings.

In 34.69% of the cases, the sample firms used "before / excluding / without" to highlight pro forma earnings, in 18.37% the terminology "core," and "adjusted / underlying" in 14.29% of the cases. Their results highlight the inconsistency in the naming of pro forma metrics.⁴¹

Similar to Bassen et al. (2012), "restructuring" (13.38%) and "fall in value" (25.35%) were the most used adjustment reasons. "Other" (unspecified reasons) accounted for a total of 16.90%. The authors found that 42.86% of all pro forma metrics were sufficiently explained and highlighted.⁴² Besides, Leibfried and Venzin also reported on the quantitative changes from pro forma adjustments. They did so by comparing the adjustment to total revenue. On average pro forma metrics were 1.93% higher than their GAAP counterpart. Approx. 75% of all adjustments had a positive effect on earnings. Furthermore, companies with a net loss in the reporting year were more likely to adjust their earnings before metrics upward. The median of all adjustments for companies with a net loss was 23.63% of total revenue, whereas companies with net profits made median adjustments of 1.15% of total revenue.⁴³

3.2 | Research gap

In comparison to recent years, little research has been done when it comes to pro forma earnings metrics in annual reports for German publicly traded companies. The literature described prior, reaches as far back as 2014, leaving a gap between recent years. Other studies conducted earlier for companies within the German stock index, like Hitz and Jenniges⁴⁴ in 2008 and Küting and Heiden⁴⁵ in 2002 do not differentiate between pro forma metrics and earnings before metrics. Considering pro forma was a new topic in those years and the definition has shifted since then, analyzing the annual reports of 2020 can bring new results.

4 | EMPIRICAL ANALYSIS OF PRO FORMA METRICS IN GERMAN PUBLIC COMPANIES

4.1 | Description of research questions

The key aim of our analyses is to highlight how popular pro forma earnings are within the annual reports of companies which are constituents of the German DAX and MDAX index. Our analyses therefore focus on the usage

of pro forma earnings data within annual reports of large German publicly traded companies. To do so, we address the following five key research questions:

1. How frequent are pro forma metrics found in annual reports?
2. Which pro forma earnings metrics are found most frequently?
3. What are the key reasons for adjusting GAAP compliant earnings?
4. How transparent are pro forma metrics presented and reconciled?
5. What is the quantitative difference between GAAP and pro forma earnings and is the effect generally positive or negative?

Although our analyses focus predominately on pro forma earnings, the data presented will include also earnings before metrics for matter of comparability to earlier studies as well as for comprehensiveness. Pro forma metrics which are not earnings related, like cash flow pro forma, pro forma adjustments within balance sheet items or non-financial pro forma performance indicators were not part of your analyses.

To answer research question three, data for the type of reason specified by the companies was collected. The data is supposed to show what kind of line items are excluded. Furthermore, they also provide insights into whether the adjustments are based on non-recurring, non-cash, or other types of line items. Considering that pro forma earnings are supposed to relay additional information to the readers of annual reports and that the foundation of the additional information is to be able to better evaluate future performance, the type of items excluded is of great interest.

Research question four is addressed in three different ways. Firstly, we analyze which instruments companies use to translate or reconcile pro forma metrics to its GAAP earnings counterparts. Secondly, we study the naming of pro forma metrics. Lastly, we present information on in which part of the annual report pro forma metrics are mostly found.⁴⁶

A more quantitative approach is taken to answer the fifth research question. Data is presented to show the percentage difference between pro forma metrics and their GAAP based counterpart. The data for “EBIT”, “EBITDA,” and “EPS ”is computed separately, with the rest of the metrics being summed up in “others.” This was done due to the small amount of each pro forma metric. Moreover, the data differentiates between the companies within the DAX and the MDAX index. Finally, the general direction of pro forma adjustments is shown. This is done by evaluating how many adjustments had a positive and how

TABLE 1 Sample size

	DAX	MDAX	Total
Companies in index	30	50	80
Excluded due to sector affiliation	6	5	11
Excluded due to size (market cap)	0	29	29
In sample	24	26	50

many adjustments had a negative impact on their GAAP counterpart.

4.2 | Sample description and sample selection process

The basis of the selected sample are the annual group reports of the constituents of the German DAX and MDAX market index for the year 2020. In the case a company's annual group report fiscal year is different to the calendar year, the annual group report for 2019/2020 was selected. The annual reports for all companies were hand-collected from the companies' webpages. The English version for the annual reports were used.

Our data sample comprises of GAAP earnings values and their pro forma counterpart, as well as qualitative data like the location of the annual report in which pro forma values are found and the reasoning for each adjustment. The data was extracted manually by going through each annual report and creating a data base, which then was used for further analysis and calculations. Our sample comprises of 50 companies in total.

Table 1 shows the number of companies within the sample, differentiated by index. It, furthermore, shows the numerical adjustment done to arrive at a sample size of 50. First, companies within the insurance and banking sector were excluded. This follows the approach applied in earlier studies and allows us to compare our results with the studies highlighted previously. Furthermore, the exclusion of companies within the insurance and banking sector was done due to the specific accounting standards that these companies apply. The accounting rules in the insurance and banking sector are influenced by sector specific regulations, which makes them incomparable to the rest of the sample data.⁴⁷ As seen in Table 1 a total of 11 companies are affected by this adjustment, out of which six are within the DAX index and five more from the MDAX index. Secondly, to limit our sample size to 50, a size ranking of the companies within the two indexes was performed. The ranking was based on the companies' market capitalization. Since our sample focusses on annual group reports for 2020, the ranking was done as of 31. December 2020. The respective market capitalizations were calculated based on data provided by Deutsche Börse Group.⁴⁸ Since both the DAX

TABLE 2 Number of companies using pro forma earnings and earnings before metrics

	Pro forma	Earnings before	Neither
Amount	44	48	0
Percentage	88.00%	96.00%	.00%

TABLE 3 Number of pro forma earnings metrics used

	DAX	MDAX	Total
Number of Pro forma earnings	55	41	96
Pro forma earnings per company	2.29	1.58	1.92

index as well as the MDAX index are ranked by market capitalization anyway, only companies of the MDAX index were excluded due to the size criterion.

The final sample includes 50 companies, of which 24 are DAX and 26 MDAX constituents, preparing their financial statements either in accordance to IFRS or US-GAAP. Finally, since no company had missing information, there was no need to adjust further.⁴⁹

4.3 | Empirical results

As discussed in Section 2.2, our results differentiate between pro forma metrics and earnings before metrics. Therefore, “pro forma” in the following context does not include any kind of earnings before metric. As a starting point, Table 2 provides information on how many companies include pro forma metrics in their annual group reports.

Out of the 50 companies analyzed, 88.00% used pro forma earnings. Out of the remaining six companies, three in the MDAX and DAX each did not report any pro forma earnings. The number of companies using earnings before metrics is marginally higher. Only two out of the analyzed 50 did not use earnings before data, amounting to 96.00% of all companies within the sample making use of earnings before data. Both companies not reporting earnings before data were part of the DAX index. The number of companies using neither of those two metrics was zero.

Table 3 reports the number of pro forma earnings metrics used by the companies in our sample. Companies within the DAX use pro forma metrics more frequently. On average, companies in the sample reported roughly two (1.92) pro forma earnings metrics per annual report. The company that showed the greatest number of pro forma metrics was Fresenius Medical Care AG & Co. KGaA and Linde PLC with 6.

The findings on the frequency of pro forma earnings metrics for the year 2020 are in comparison to the three studies outlined above. Pro forma earnings can therefore

be seen as a fixed component of annual group reports of large German companies. Additionally, one can infer from comparing our results with past research that the reporting of pro forma measures has increased over the years.⁵⁰ Not only have the number of companies using pro forma reporting gone up, furthermore the average amount of pro forma earnings metric found increased. This result is interesting because the amount of regulation, in particular for IFRS, concerning pro forma has increased.⁵¹

To answer research question two, data was collected which shows what type of pro forma metric is mostly used by the companies in our sample (Table 4). The inclusion of “sales” and “volume” as a pro forma earnings metrics is explained by the fact that these are both closely related to the statement of income, with sales being a line item and volume being intertwined with sales. Furthermore, “pro forma ROCE” was included due to its earnings metric nature. It should be noted that unadjusted “ROCE” was not included within the sample shown, due to it neither being a pro forma metric nor an earnings before metric.

Similar to the research studies outlined in 3.1, the most popular pro forma earnings metric is “EBIT” with 34 companies using it and comprising 35.42% of all pro forma metrics. Pro forma “EBITDA” follows with a total of 27 use cases covering 28.13% of all pro forma earnings metrics. EPS and the closely related net income were more prominent among the shown pro forma metrics, accounting for 11.46% and 8.33% of all pro forma uses, respectively. Apart from the four previously outlined pro forma earnings types, the rest are often seen in more fringe use cases that differ from company to company.

Similar to the pro forma data, the earnings before metrics are also consolidated and analyzed (Table 5). The most popular earnings before metric is “EBIT,” being the most represented earnings before metrics in our sample with 51.81% of all observations. “EBITDA” follows with a total of 32 use cases and 38.55% of all earnings before metrics. The remaining 9.63% are shared by “EBIAT” and “EBT.” In comparison to earlier data there are no large differences. This is no surprise considering that earnings before metrics are an older element of earnings reporting and the individual items are more defined.

To further see how companies usually chose to show pro forma earnings metrics, Table 6 shows the used labels of companies within the sample. Amounting to 51 (51.00%) use cases, “adjusted” is the most used label to describe pro forma earnings metrics and represents the majority. Following “adjusted” the next most used tag “before,” with a total of 11 (11.00%) times used. “After” “continuing” “footnote” all had the same amount of use with five cases within the sample. One can group “before,” “after,” “pre,” and “excluding” together, as these labels are used to usually

TABLE 4 Type of pro forma earnings metric^a

	Pro forma		Pro forma %
EBIT	34		35.42%
EBITDA	27		28.13%
EPS	11		11.46%
Net income	8		8.33%
EBITA	3		3.13%
Profit	3		3.13%
Revenue	3		3.13%
ROCE	2		2.08%
Sales	2		2.08%
Earnings ^b	1		1.04%
EBT	1		1.04%
Volume	1		1.04%
Total	96		100.00%

^aA table which includes earnings before data can be found under Table 5. All data shown here is adjusted.

^bFor clarification of the earnings line item, Sartorius AG uses 2 different names for pro forma net profit. For one, they use “Relevant Net Profit” and secondly they then name it “Underlying earnings after taxes and non-controlling interest.”

TABLE 5 Type of pro forma metric and earnings before metric

	Pro forma	Earnings before	Total	Pro forma %	Earnings before %	Total %
EBIT	34	43	77	35.42%	51.81%	43.02%
EBITDA	27	32	59	28.13%	38.55%	32.96%
EPS	11	0	11	11.46%	.00%	6.15%
Net Income	8	0	8	8.33%	.00%	4.47%
EBT	1	5	6	1.04%	6.02%	3.35%
EBIAT	0	3	3	.00%	3.61%	1.68%
EBITA	3	0	3	3.13%	.00%	1.68%
Profit	3	0	3	3.13%	.00%	1.68%
Revenue	3	0	3	3.13%	.00%	1.68%
ROCE	2	0	2	2.08%	.00%	1.12%
Sales	2	0	2	2.08%	.00%	1.12%
Earnings ^a	1	0	1	1.04%	.00%	.56%
Volume	1	0	1	1.04%	.00%	.56%
Total	96	83	179	100%	100%	100%

^aFor clarification of the earnings line item, Sartorius AG uses 2 different names for pro forma net profit. For one, they use “Relevant Net Profit” and secondly they then name it Underlying earnings after taxes and non-controlling interest.

highlight a specific item within the header, for example, “EBIT before restructuring.” The sum of these identifiers is 24. The two labels most used within research, “non-GAAP” and “pro forma,” only amount to a total of four

use cases. The tag “footnote” in this case means that a company, for example, used “EBIT*” in a table and then explained in a footnote how the line item was adjusted or that the line item was adjusted in the first place.

TABLE 6 Observed naming of pro forma earnings data

Type	Amount		In percent
Adjusted	51		51.00%
Before	11		11.00%
After	5		5.00%
Continuing	5		5.00%
Footnote	5		5.00%
Excluding	4		4.00%
Pre	4		4.00%
Core	3		3.00%
Non-IFRS	3		3.00%
Underlying	3		3.00%
Ordinary	2		2.00%
Delivered	1		1.00%
Pro Forma	1		1.00%
Relevant	1		1.00%
Total	1		1.00%
Total	100		100%

Lastly is to be noted that the difference between the total amount of pro forma metrics found within the sample and the total amount of naming labels originates from the fact that for a total of four pro forma metrics, two different name tags have been used within the same annual report. Therefore, the total amount of tags is higher than the number of pro forma metrics.

To further analyze why pro forma reporting is used by companies, the specific line items excluded are shown in Table 7. The types shown are summarized categories of adjustments named within annual reports of companies in the sample. The adjustment types shown are used by companies to explain why they did not include specific earnings and expenses in the pro forma metric. For the total amount of 96 reported pro forma earnings metrics, a total of 322 individual reasons for adjustment were given.










Similar to prior research, we classified the reasons for adjusting GAAP earnings in "Accounting," "Acquisitions," "Divestitures," "Increase in value," "Decrease in value," and "Legal." Items consolidated under these subtotals are typically non-recurring and non-operational in nature, and therefore warrant an adjustment. Besides, we introduce the classification "Other Category," which is used

by us for adjustments that are unrelated to any of the aforementioned subtotals. Within the classification "Other Category," we differentiate between non-recurring and/or non-operating income or expense items, and recurring and/or operating income or expense items, that were surprisingly adjusted in a firm's GAAP earnings. Additional information on the adjustments by subtotal (i.e. reasons) can be found in Table 8.⁵²

Apart from the "Other Category (non-recurring, non-operating)," "Restructurings" and related costs represent the most mentioned reason for adjusting earnings data, amounting to a total of 59 (18.32%) cases. Followed by "Acquisitions" and associated expenses, amounting to a total of 48 (14.91%), and "Reduction in value" which consists of amortization and impairments with a value of 47 (14.60%). Further adjustment reasons were "Divestitures" with a value of 33 (10.25%), "Other category" (consists out of single line item that is unrelated to any of the other subtotals) with a value of 24 (7.45%), "Accounting" with 23 (7.14%), "Increase in Value" with 15 (4.66%), and "Legal" with a value of 12 (3.73%).

Within the "Accounting" subtotal, companies adjusted their earnings metrics five times due to changes in

TABLE 7 Type of reason specified for the pro forma adjustment^a

	Amount		Amount in %
Restructuring	59		18.32%
Acquisitions	48		14.91%
Reduction in value	47		14.60%
Divestitures	33		10.25%
Accounting	23		7.14%
Increase in value	15		4.66%
Legal	12		3.73%
Other category (non-recurring, non-operating)	61		18.94%
Other category (recurring, operating)	24		7.45%
Total	322		100.00%

^aThe findings are consolidated into main categories due to place constraints and for greater clarity of the main findings. The unconsolidated results, which include GAAP earnings before data, can be found under Table 8.

accounting related to IFRS 16. Under the “Other Category (recurring, operating),” we identified recurring income statement items, which however to our surprise were adjusted by the companies’ senior executives. Companies within the sample excluded, for example, share-based expenses nine times and expenses relating to cost of capital eight times. Research and development expenses were excluded twice. We consider their exclusions questionable as they often represent cash expenses and therefore also impact a firm’s cash flow. It could however be possible that firm adjusted these items due to their extraordinary levels in the financial year.

In our data set, the largest single category (i.e., reasons) for pro forma adjustments is “Other Category (non-recurring, non-operating)” with 61 observations, accounting for 18.94% of all adjustments. This is predominately true to the fact that several firms did not fully disclose the exact reason for their adjustments and/or aggregated several adjustments into one line item, which made it difficult for us to allocate them directly to one of the aforementioned reasons. This holds true for more than half of the adjustments which are part of this category (48 out of 61 observations).

Our results are comparable with those of previous studies. In more detail, “Restructuring” is one of the most frequently cited reasons for pro forma adjustments in our sample, followed by “Acquisitions” and “Reductions in value.” Prior research came to similar conclusions. The only category of reasons given for pro forma adjustment in our data set that is higher compared to the earlier research is “Other.”

We address the question of transparency of the companies’ adjustments through two different analyses which are presented below. Firstly, where in the firms’ annual report pro forma metrics were mostly found and secondly discussing how the reconciliation from non-GAAP to GAAP metric took place.

Table 9 contains information on where the sample companies reported pro forma earnings metrics within the annual report. It should be noted that the “segment report,” “remuneration report,” and “outlook” are part of the “management report.” In case of pro forma metrics being shown within the “segment report,” but not at any other point of the “management report,” they were only counted towards the total amount of pro forma metrics within the “segment report” and were not included within the total number of the “management report.”

As outlined above, 44 of our 50 sample companies disclosed pro forma earnings metrics in their annual reports. 41 of these 44 companies (i.e., 93.18%) opted to show pro forma earnings within the management report. Displaying pro forma metrics in the “overview” was the second most preferred choice (with 36 companies, or 81.82%) of all annual reports within the sample displaying this characteristic. Following are the “segment report” with 30 (68.18%) use cases, “notes” with 29 (65.91%) use cases, “remuneration report” with 14 (31.82%) use cases and “outlook” with 13 (29.55%) use cases. The location in which the least amount of pro forma earnings metric was found within our sample was the “appendix” with a total of 9 (20.45%) times. Our results suggest that pro forma metrics are more heavily used at the beginning than at the end of the annual report.

TABLE 8 Detailed view of reason specified for adjustment^a

	Modified	Earnings	Total	Pro forma %	Earnings %	Total %
Restructuring (Sum)	59	0	59	18.32%	.00%	17.99%
Acquisition	42	0	42	13.04%	.00%	12.80%
Integration	6	0	6	1.86%	.00%	1.83%
Acquisitions (Sum)	48	0	48	14.91%	.00%	14.63%
Impairment	21	0	21	6.52%	.00%	6.40%
Goodwill (Impairment)	15	0	15	4.66%	.00%	4.57%
Amortization	11	0	11	3.42%	.00%	3.35%
Decrease in value (Sum)	47	0	47	14.60%	.00%	14.33%
Divestitures	19	0	19	5.90%	.00%	5.79%
Sale of business	6	0	6	1.86%	.00%	1.83%
Disposal	5	0	5	1.55%	.00%	1.52%
Held for sale	3	0	3	.93%	.00%	.91%
Divestitures (Sum)	33	0	33	10.25%	.00%	10.06%
Share-based	9	0	9	2.80%	.00%	2.74%
Capital Cost	8	0	8	2.48%	.00%	2.44%
Currency	3	0	3	.93%	.00%	.91%
R&D	2	0	2	.62%	.00%	.61%
Pension	1	0	1	.31%	.00%	.30%
Provision	1	0	1	.31%	.00%	.30%
Other Category (Sum)	24	0	24	7.45%	.00%	7.32%
Accounting (Other)	8	0	8	2.48%	.00%	2.44%
IFRS 16 Changes	5	0	5	1.55%	.00%	1.52%
Fair value Accounting	5	0	5	1.55%	.00%	1.52%
PPA	4	0	4	1.24%	.00%	1.22%
Financial Covenant	0	2	2	.00%	33.33%	.61%
Consolidation	1	0	1	.31%	.00%	.30%
Accounting (Sum)	23	2	25	7.14%	33.33%	7.62%
Write up	8	0	8	2.48%	.00%	2.44%
Reversals	7	0	7	2.17%	.00%	2.13%
Increase in Value	15	0	15	4.66%	.00%	4.57%
Legal (Other)	7	0	7	2.17%	.00%	2.13%
Litigation	3	0	3	.93%	.00%	.91%
Export	1	0	1	.31%	.00%	.30%
Subsidies	1	0	1	.31%	.00%	.30%
Legal (Sum)	12	0	12	3.73%	.00%	3.66%
Others	48	0	48	14.91%	.00%	14.63%
One-time	7	0	7	2.17%	.00%	2.13%
Calculation	2	4	6	.62%	66.67%	1.83%
Segment	2	0	2	.62%	.00%	.61%
Voucher Reduction	1	0	1	.31%	.00%	.30%
Severance	1	0	1	.31%	.00%	.30%
Other (Sum)	61	4	65	18.94%	66.67%	19.82%
Total	322	6	328	100.00%	100.00%	100.00%

^aIncludes earnings before data for comprehensiveness. The earnings before data shown here was usually used as an interim result and therefore the type "none" was commonly used in the table to describe the reason specified. The bold values found under the double border line are sums highlighted in the main text.

TABLE 9 Location of modified pro forma values^a

	Count	In % of all companies (i.e., base = 44 firms)		Total % (i.e., base = 172 observations)
Overview	36	81.82%		20.93%
Management report	41	93.18%		23.84%
Segment report	30	68.18%		17.44%
Remuneration	14	31.82%		8.14%
Outlook	13	29.55%		7.56%
Notes	29	65.91%		16.86%
Appendix	9	20.45%		5.23%
Total	172			100.00%

^aThe total here is 44, which is derived from the total amount of companies using pro forma earnings within their annual reports in the data sample.

TABLE 10 Type of reconciliation used

	Header	Text	Footnote	Table	Total
Amount	7	78	51	66	202
Pro Forma %	7.29%	81.25%	53.13%	68.75%	2.10
Total %	3.47%	38.61%	25.25%	32.67%	100.00%

TABLE 11 Type of reconciliation used adjusted by highest denominator^a

	Header	Text	Footnote	Table	Total
Amount	5	20	5	66	96
In percent	5.21%	20.83%	5.21%	68.75%	100%

^aHighest denominator in this case the most transparent measure used, ranging from Table, to Text, then header and finally footnote.

Subsequently, the type of reconciliation used within the data set is highlighted. To do so, Tables 10 and 11 are presented. Even though companies are forced to reconcile their non-GAAP earnings with GAAP earnings in annual reports, there is a large degree of variance found at how exactly companies chose to reconcile pro forma earnings.

To explain the line item “table” within the following charts and tables, Figure 1 is presented. Figure 1 shows a reconciliation in a general tabular form. Typically, such a presentation would be accounted for as a reconciliation in the form of a table.

However, in this specific case, the only line item highlighted is “Special Items,” reconciling “EBIT” to “EBIT before special items.” No further breakdown of the “Special Items” is provided. Reconciliation tables which were used in the described manner were not counted within the data sample under “table,” as they do not contain information pertaining which kind of reasoning was used. The

same is true for the other types of reconciliation used, if a footnote simply states the value was adjusted by exceptionals it is not accounted for within the “footnote” data. Furthermore, the data is counted per pro forma metric, amounting to on average 2.1 ways of reconciling the pro forma metric.

Table 10 shows which type of reconciliation the companies in the sample used. “Header” means, that the explanation is contained within the name of the pro forma earnings metric. An example for this would be “EBITDA before restructuring measures.” Similarly to Table 11, the mentioned pro forma earnings metric would only be accounted for within the “header” column, if the metric was not further explained by either a reconciliation table or text.

In total, we observed that the 96 different pro forma metrics⁵³ were reconciled 202 times by the companies in our sample, which implies that every pro forma metric was reconciled on average in 2.10 different ways (e.g., by means of both a table and in text format). When using the 96 different pro forma metrics as the basis for analysis, the most used type of reconciliation was in “text” format (81.25%), followed by a reconciliation via tabular form (68.75%) and “footnotes” (53.13%).

We derive similar results when using the total amount of reconciliation types (202) as the basis for analysis. Here again, the most frequently used type of reconciliation was in “text” format (38.61%). A reconciliation via tabular form with a total number of 66 (32.67%) use cases and “footnotes” with 51 cases (25.25%) were also found in our sample. The “header” format was the least used type of reconciliation, amounting to seven of all use cases (3.47%).

To further examine the degree of transparency, we analyzed in how many cases tables were used to reconcile

*EBITDA before special items**in EUR Million*

<i>EBIT</i>	(200)
<i>- Special items</i>	(3,000)
<i>EBIT before special items</i>	2,800
<i>+ Depreciation and amortization</i>	1,000
<i>+ Impairments and reversals of impairments on PP&E</i>	300
<i>Depreciation, amortization, impairments and reversals of impairments</i>	1,300
<i>EBITDA before special items</i>	4,100

FIGURE 1 Example of a pro forma reconciliation

non-GAAP to GAAP metrics and in how many cases they were not used.

We consider the reconciliation presentation through tables as the most transparent as they allow for a line by line analysis of the individual adjustments. The results of this analysis are presented in Table 11. In 66 use cases (68.75%), tables were used to reconcile the identified 96 pro forma metrics. This means in 30 use cases (31.25%) no reconciliation tables were presented. If no reconciliation tables were used, in 20 use cases (20.83%) the reconciliation took place in text format and in five use cases each (5.21%) in the format of a header or footnote. Considering that tables which reconcile non-GAAP to GAAP the most transparent, the high amount of reconciliation tables is a positive characteristic for transparency. It needs to be noted that particularly simple, one-line-item adjustments can be well explained within a header. This means that the “header” type of reconciliation used is not necessarily negative for transparency. Footnotes, however, feature negative characteristics, as these were often used in conjunction with only showing the pro forma metric within the overview.

Overall, the resulting transparency is more positive than negative. Most pro forma metrics reported were shown in a transparent manner and were not overly emphasized over the GAAP earnings. This can be seen in the amount of reconciliation types being used. Furthermore, we identified pro forma metrics throughout the annual reports. The only underrepresented location within the data set is the appendix. However, of concern is the highlighted amount of non-transitory items excluded within pro forma metrics.

In a subsequent step, we analyze the quantitative differences between GAAP and pro forma earnings and whether the net effects from the adjustments are typically positive or negative in comparison to the unadjusted GAAP metrics. Table 12 shows the relative change from GAAP to pro forma metric. The table presents the individual results for

pro forma “EBIT,” “EBITDA,” and “EPS,” for which we had more than 10 data points. We therefore considered it meaningful so analyze them separately. Besides, these three pro forma metrics make up 75.00% of all observations in our sample. All other pro forma metrics are consolidated in the column “Others.” Furthermore, we present our findings grouped by index constituents.

On average, earnings adjustments led to pro forma earnings being 86.62% (mean) higher than their GAAP counterparts. However, due to the high variance from several outliers, we focus on the median values for further analyses. Within the entire sample, the earnings adjustments led to pro forma earnings being 14.18% (median) higher compared to their GAAP counterparts. For the DAX companies we observe a median of 16.67% as a results of the companies’ pro forma adjustments, whereas the MDAX companies display a median of 11.33%. For each earnings measure (EBITDA, EBIT, EPS, and others), we observe a positive difference, which potentially could include several individual expense or income adjustments. The median difference between pro forma earnings and their GAAP counterparts increases from EBITDA (6.22%) to EPS (32.42%), which could be explained by the fact that earnings adjustments typically focus on expenses that are output independent and have therefore a fix cost nature, leading to a higher relative change the further down an earnings metric is in the income statement. Furthermore, one can argue that often substantial impairments and other non-recurring write-offs are adjusted in EBIT (see Table 8), therefore leading to a material median increase of EBIT by 26.80% and EPS by 32.42%.

Overall, Table 12 shows that on a net (i.e., combined) basis, pro forma adjustments usually lead to earnings that are higher than their corresponding GAAP counterparts. However, to definitively answer how many of these adjustments increase or decrease earnings, we further analyzed our data set. As outlined in Table 13, in 77 of the 89

TABLE 12 Percentage change from earnings metric to pro forma metric

	EBITDA	EBIT	EPS	Others	Total
Median	6.22%	26.80%	32.42%	16.75%	14.18%
Thereof DAX	5.65%	28.95%	61.54%	14.74%	16.67%
Thereof MDAX	6.79%	20.26%	22.60%	22.66%	11.33%
Average	28.69%	132.90%	231.20%	31.87%	86.62%
Thereof DAX	53.25%	167.16%	284.68%	21.60%	101.37%
Thereof MDAX	7.90%	102.92%	137.61%	58.82%	67.57%

TABLE 13 Which effect do pro forma adjustments have on earnings (absolute observations)

	EBIT	EBITDA	EPS	Others	Total
Positive effect	26	23	10	18	77
DAX	13	11	7	13	44
MDAX	13	12	3	5	33
Negative effect	3	0	1	8	12
DAX	1	0	0	6	7
MDAX	2	0	1	2	5

observable cases, pro forma adjustments had a positive (i.e., increasing) effect on earnings. In only 12 cases, the effect was negative (i.e., decreasing). Table 13 also reports our findings by earnings metrics (i.e., EBIT, EBITDA, EPS, and others).

Table 14 presents our results on the impacts of pro forma adjustments in relative terms. In 86.52% of all observable cases, a pro forma adjustment had a positive impact on earnings and therefore led to earnings that are higher than their GAAP counterparts. For companies within the DAX, 86.27% of all adjustments are positive. This number is highly similar to the one observable for companies which are part of the MDAX (here, 86.84% of all adjustments had a positive earnings effect). Therefore, companies in both indexes show similar patterns. An outlier in the table is the item “EBITDA,” which had only pro forma adjustments which had a positive impact on the GAAP metric, increasing it in all cases within the sample. The column “others” on the other hand sees with 69.23% the lowest number of pro forma adjustments that had an overall positive effect on the GAAP metric. Yet, most adjustments within the “others” column were still earnings increasing.

Our results show that pro forma adjustments are overall focused on eliminating expenses rather than eliminating earnings. These finding are comparable to those of studies conducted previously,⁵⁴ showing a consistent trend for pro forma adjustments over the past 15 years. Therefore, pro forma earnings tend to overly show financial success

compared to GAAP earnings. As our results are derived based on a sample of pro forma adjustments from a single financial year, we cannot comment on whether pro forma adjustments are predominately focused on eliminating transitory, non-recurring items or on artificially inflating earnings, pretending a higher operating performance and thereby potentially misleading investors.

4.4 | Limitations













Our previous outlined research has two key limitations. Firstly, we conduct our analysis on the basis of a relatively small sample. Adding additional companies to our sample would have increased the explanatory power and validity of our findings. However, as we wanted to analyze the usage of pro forma metrics by large German companies, there are natural limitations of the number of firms that we can analyze.

Secondly, our results pertain exclusively to annual reports published for the financial year 2020. To show tendencies of the usage of pro forma earnings over the years, additional data from previous years would have to be collected and analyzed. However, our results document the most current practices of using pro forma by large German companies.

5 | CONCLUSION

Pro forma metrics are heavily by German publicly traded companies. In our sample a total of 88.00% companies used pro forma earnings and all companies used either earnings before or pro forma metrics. Our results on the utilization of pro forma earnings and earnings before metrics by large German companies are slightly higher than those of earlier studies on German companies,⁵⁵ although rather similar to findings for large Swiss companies.⁵⁶ The reasons for adjustments are consistent with previous research,

TABLE 14 Which effect do pro forma adjustments have on earnings (relative observations)

	EBIT	EBITDA	EPS	Others	Total
					
Positive effect	89.66%	100.00%	90.91%	69.23%	86.52%
DAX	92.86%	100.00%	100.00%	68.42%	86.27%
MDAX	86.67%	100.00%	75.00%	71.43%	86.84%
					
Negative effect	10.34%	.00%	9.09%	30.77%	13.48%
DAX	7.14%	.00%	.00%	31.58%	13.73%
MDAX	13.33%	.00%	25.00%	28.57%	13.16%

showing that certain items like restructuring expenses, impairment charges, acquisition-related costs or legal costs are commonly found within pro forma adjustments.

We also identified issues with the reporting of pro forma metrics in practice. Considering the original purpose of these non-GAAP metrics, being to increase the information content for readers of annual reports and to create more transparency on the operational performance of a firm, the explanation quality and structure in which pro forma earnings were reported was in some cases lacking. This is predominately supported by the observation that several companies in our sample opted not to include any reconciliation tables and the substantial difference between reported GAAP values and pro forma values.

Furthermore, it is questionable which benefit arise to readers of financial statement if certain costs are consistently excluded when communicating operational performance. If share-based compensation, for example, is an expense which a company must face regularly over the years and it has an impact on its cash flows, removing that measure from a GAAP earnings metric can decrease the overall amount of information the metric has. This is since it will regularly impact the bottom line of the companies share- and stakeholders. Such measures seem to be only benefitting managers and positively influence the perception of readers of the annual report.

A solution for adding more transparency for pro forma data can be a regulatory change stemming from a governmental bodies or accounting standards boards. An example for a regulatory change could a proposed reconciliation table with certain mandatory line items be. It would increase overall information for the readers of annual reports and serve as a basis for adding more specific items. An example here is the introduction of outlining certain costs, such as legal, restructuring or acquisition as minimal requirement in reconciliation tables. This could prevent the occurrence of reconciliation tables, where the

only line item is “special items.” However, considering the current environment for pro forma earnings metrics, one must face “Core,” “Underlying,” and “Special Items” with a certain degree of skepticism, especially if their GAAP counterparts differ from them substantially.

Nevertheless, the usage of pro forma metrics can result in value added for readers of earnings publications. Being able to distinguish between recurring and non-recurring profit and loss items can enable readers to have a better judgement when it comes to estimating future cash flows of a given company and therefore a more accurate company valuation. It is a tool which not only publicly traded companies use when communicating with shareholders, but also financial institutions, analysts, and data providers. The consistent use of pro forma earnings over the decades shows an overall interest for pro forma earnings metrics and hints towards additional benefits over the GAAP compliant data for people reporting and reading about these metrics.

We believe that presence of pro forma earnings metrics is likely to stay, unless regulatory measures are introduced which prohibit or limit the amount of non-GAAP measures. Ultimately, the advantages and disadvantages of pro forma earnings measures for both managers and readers of financial reports have intertwining effects. Supply and demand for additional information is determined by how complicated the supplied information is. If pro forma adjustment explanations are informative and create value added, the demand for such an inclusion will rise. Furthermore, managers can opt to provide clearer information to readers, if the GAAP metric has additional complexity attach to it, like a large divestiture boosting earnings by a large amount. This can help alleviate information symmetries and result in a metric which is closer to future cash flow. For adjustments of earnings to be of use, a degree of transparency must be established. Furthermore, its use should be that of creating additional information, instead

of promoting the goals of managers. Otherwise, the threat of readers to simply disregard the pro forma metric is high. Additionally, non-GAAP metrics should be done year over year consistently. If reported pro forma metrics of prior years were misleading, then stakeholders would discount those metrics and furthermore damaging the company's reputation. Therefore, managers should be incentivized to align their goal with those of readers of the financial earnings publications. However, the possibility of managers being able to influence what information is disclosed, and therefore being able to adjust it to a point which benefits themselves most, should be kept in mind.

ENDNOTES

- ¹ See Halsey and Soybel (2002).
- ² See Moscariello and Pizzo (2020), p. 8.
- ³ See Black et al. (2017), pp. 3–4.
- ⁴ See Bradshaw and Sloan (2002).
- ⁵ See U.S. Securities and Exchange Commission 10/12/2000.
- ⁶ See Leibfried and Venzin (2014).
- ⁷ See Arena et al. (2021), pp. 656–657.
- ⁸ See Barth et al. (2011), p. 2.
- ⁹ See United States, p. 42.
- ¹⁰ See Committee of European Securities Regulation October 2005.
- ¹¹ See European Commission 7/19/2002, p. 3.
- ¹² See IFRS Foundation (2019a).
- ¹³ See Hitz (2010), p. 66.
- ¹⁴ See Bassen et al. (2012), pp. 361–362.
- ¹⁵ See N. Bhattacharya et al. (2007), p. 583.
- ¹⁶ See Black et al. (2017); Moscariello and Pizzo (2020); and Arena et al. (2021), for example, papers which use “non-GAAP” rather than “pro forma” as the primary term.
- ¹⁷ See N. N. Bhattacharya et al. (2003), pp. 2–3.
- ¹⁸ See Gehrig-Ehrenzeller (2020), pp. 459–460.
- ¹⁹ See Fischer (2014); Leibfried and Venzin (2014); and Hitz and Jenniges (2008).
- ²⁰ See Hitz (2010), pp. 81–82; and Reimsbach (2014).
- ²¹ See Lambert (2004), p. 206.
- ²² See Hitz and Jenniges (2008), pp. 238–239.
- ²³ See Hitz (2010), p. 77.
- ²⁴ See Elliott (2006), pp. 118–121.
- ²⁵ See Brealey et al. (2014), p. 460.
- ²⁶ See Black et al. (2021), p. 3.
- ²⁷ See Entwistle et al. (2010), p. 264.
- ²⁸ See Yang (2018), pp. 879–880.
- ²⁹ See Hitz (2010), pp. 70–72.
- ³⁰ See Hitz (2010), pp. 72–74.
- ³¹ See Hitz (2010), pp. 74–75.
- ³² See Hitz (2010), pp. 75–76.
- ³³ To do so four tiers were created, ranging from one which means no disclosure of the type of adjustment to four meaning full reconciliation.
- ³⁴ See Hitz (2010), pp. 76–77.
- ³⁵ See Bassen et al. (2012), p. 362.
- ³⁶ See Bassen et al. (2012), pp. 361–362.
- ³⁷ See Bassen et al. (2012), p. 362.

- ³⁸ The reason “others” was used when a certain reasoning could not be categorized into another category.
- ³⁹ The relevance of Swiss companies to the empirical research is two-fold. For one is it a German-speaking country and the usage of accounting standards is similar to those with large German publicly traded companies. See IFRS Foundation (2019b) And See Bryois and Welser (2014).
- ⁴⁰ See Leibfried and Venzin (2014), pp. 62–63.
- ⁴¹ See Leibfried and Venzin (2014), pp. 63–64.
- ⁴² See Leibfried and Venzin (2014), pp. 63–64.
- ⁴³ See Leibfried and Venzin (2014), pp. 64–65.
- ⁴⁴ See Hitz and Jenniges (2008), pp. 240–241.
- ⁴⁵ See Küting and Heiden (2002), pp. 1087–1088.
- ⁴⁶ The naming of pro forma metrics does give management a degree of freedom in which they can chose to frame particular pro forma metrics (See Rouen et al., 2019; N. N. Bhattacharya et al., 2003, p. 5).
- ⁴⁷ See Hitz and Jenniges (2008), p. 239.
- ⁴⁸ The Deutsche Börse AG is responsible for determining which companies are included within the DAX index as well the MDAX index among other indexes. One main criterion used is market capitalization. See Deutsche Börse AG (2021).
- ⁴⁹ This was mentioned for comprehensibility, since prior research often cites missing availability of data as a reason for exclusion, especially when looking at several periods.
- ⁵⁰ See Bassen et al. (2012), p. 363; Leibfried and Venzin (2014), p. 63; and Hitz (2010), p. 73.
- ⁵¹ See Moscariello and Pizzo (2020), p. 11.
- ⁵² The same holds true for all sums shown in Table 7.
- ⁵³ As outlined previously, total number of pro forma metrics being 96; for additional information see Table 4.
- ⁵⁴ See Bassen et al. (2012), pp. 363–364; Hitz and Jenniges (2008), p. 242; and Leibfried and Venzin (2014), p. 64.
- ⁵⁵ See Bassen et al. (2012), p. 363; Hitz and Jenniges (2008), p. 242; and Hitz (2010), p. 73.
- ⁵⁶ See Leibfried and Venzin (2014), p. 63.

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How to cite this article: Wiek, M., & Eichner, K. (2023). Adjusted versus unadjusted earnings: An empirical analysis of pro forma adjustments in large German public companies. *Journal of Corporate Accounting & Finance*, 34, 47–63. <https://doi.org/10.1002/jcaf.22611>