

**HHL**LEIPZIG
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OF MANAGEMENT

Dissertation

Group Accounting in the Field of Tension Between Capital Market Communication and IFRS

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Abstract:

The overall importance of capital market communication has increased hand in hand with the development of the economic importance of the capital market itself. Equity investors use various information sources, such as management reports, consolidated financial statements, investor relation presentations, and web pages, to prepare and assess investment decisions. This cumulative dissertation consists of four manuscripts that analyses different group accounting related aspects of the capital market communication. The first two manuscripts are classified as contributions to the understanding of current IFRS topics in capital market communication. These manuscripts are case-based instructional resources and deal with group accounting decisions on financial instruments and consolidation issues. The second part of the dissertation comprises empirical analyses on financial KPI reporting across different parts of capital market communication. The manuscripts provide empirical analysis of the consistent use of financial KPIs across the different parts of capital market communication, the determinants of consistent KPI reporting and the value relevance.



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I.

Group Accounting in the Field of Tension Between Capital Market Communication and IFRS – Overview of the Dissertation

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Group Accounting in the Field of Tension Between Capital Market Communication and IFRS – Overview of the Dissertation

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1 Introduction

In the conceptual framework of the International Financial Reporting Standards (IFRS) the International Accounting Standard Board (IASB) states that financial reporting under the IFRS should provide users with decision-usefulness information for buying and selling decisions of securities. Equally important and derived from this central objective financial reporting should give investors information with which to assess the management's stewardship role (IASB, 2010). Both objectives are relevant in research discussions (Cascino et al., 2014) and are central to a secular discussion on the usefulness of financial reporting in general (Soll, 2014). Furthermore the disintegration of capital provider and management and the resulting agency cost stemming from the information asymmetry between insiders (management) and outsiders (capital provider) spurs the continuous improvement of accounting standards as the basis of efficient capital market communication (CFA, 2013) to achieve the stated conceptual framework objectives.

In the last two decades, more than 100 countries switched from national to international standards (IFRS Foundation, 2016a). The adoption of the IFRS as the obligatory accounting regulation for consolidated financial statements for listed companies in the European Union in 2005 can be seen as one of the most important milestones of the global harmonization of capital market oriented accounting standards. In the meantime, more than 24,000 capital market oriented companies worldwide use the IFRS for financial reporting purposes (IFRS Foundation, 2016b). The IASB intends to provide capital market actors with a set of high quality accounting standards and tries to improve these continuously (IASB, 2010). The capital market orientation of the IFRS is underpinned by the close cooperation between the IASB and the independent Capital Market Advisory Committee

(CMAC)¹ that supports the standard-setting process with insights about specific investors' needs.

Although the official work plan of the IASB includes various standard-setting projects, two important ones stand out: (1) a project on the improvement of group accounting standards that regulate consolidated financial statements and related disclosures of interests in other entities (IFRS 10 “Consolidated Financial Statements”; IFRS 11 “Joint Arrangements” and IFRS 12 “Disclosure of Interests in Other Entities”) and (2), a project on the accounting treatment of financial instruments (IFRS 9 “Financial Instruments”). The first project clarified and improved the group accounting standards. The question of how to account for an investment is not just highly complex in practice, but also of the utmost importance for the capital market communication of the reporting entity. Depending on the investment categorization decisions, the consolidated revenue and operating income can vary significantly. Consequently, the consolidated financial statements constitute the basis for economic decisions from capital providers. It is also the basis for key performance indicators to assess the business performance and the stewardship of the management. The second project aimed to improve the complex accounting treatment of financial instruments. Over the last decade, the IASB overhauled the accounting standards on financial instruments completely. The overhaul of the accounting standards IAS 32 “Financial Instruments: Presentation”, IFRS 7 “Financial Instruments: Disclosures” and IFRS 9 “Financial Instruments” moved the accounting treatment of financial instruments towards a more principle-based ap-

¹ According to the IFRS homepage the “[...] Capital Markets Advisory Committee (CMAC) was created as a body that would be independent of the IASB and the IFRS Foundation, with the specific aim to provide the IASB with regular input from the international community of users of financial statements.” - <http://www.ifrs.org/About-us/IASB/Advisory-bodies/CMAC/Pages/CMAC.aspx>

proach, but the application is still perceived as quite complex. The importance of these accounting standards for capital market communication can be exemplified by the role the standards IAS 32 and IFRS 9 play in determining the loss-absorption capacity of a reporting entity by regulating the classification of capital issuances as equity or debt. The resulting capital structure is pivotal for capital providers in assessing the financial position of the reporting entity (Cascino et al., 2014).

The overall importance of capital market communication has increased hand in hand with the development of the economic importance of the capital market itself. According to the OECD, the financial assets held by institutional investors in OECD countries increased considerably from 110% of the GDP in 1995 to 163% of the GDP in 2005 (OECD, 2008). Equity investors use various information sources, such as management reports, consolidated financial statements, investor relation presentations, and web pages, to prepare and assess investment decisions (Cascino et al. 2014). The different parts of capital market communication draw heavily on key performance indicators (KPIs) as firm- or industry-specific measures of performance evaluation and stewardship assessment (Elzahar et al., 2015). Although the usage of KPIs attracts increased attention from regulatory authorities and standard-setting bodies (ESMA, 2015), the level of consistency across different parts of capital market communication, the determinants and the value relevance of KPI reporting quality have so far not been thoroughly analyzed in academic literature.

This cumulative dissertation consists of four manuscripts. The first two manuscripts are classified as contributions to the understanding of current IFRS topics in capital market communication (Part 1). These manuscripts are case-based in-

structional resources. Manuscript A “**The success Story of International Additives Producer AG – A Case Study on Categorization of Investments under IFRS**” provides a comprehensive overview of the importance and complexity of group accounting decisions and the resulting consequences on capital market communication and management incentives. Manuscript B “**The Hardest Cycle Climb at TCC – A Financial Instruments Case**” discusses the intertwining consequences of financial instrument accounting and corporate restructuring decisions in the decision framework of capital providers as a case study. The second part of the dissertation comprises empirical analyses on financial KPI reporting across different parts of capital market communication. Manuscript C “**Determinants of Consistent Capital Market Communication: Evidence from Germany**” provides an empirical analysis of the consistent use of financial KPIs across the different parts of capital market communication and the determinants of consistent KPI reporting. Lastly, Manuscript D “**The Capital Market Relevance of Consistent Key Performance Indicator Reporting: Preliminary Evidence from Germany**” builds on the analysis of the previous manuscript and develops the empirical analyses further to highlight the value relevance of consistent KPI reporting.

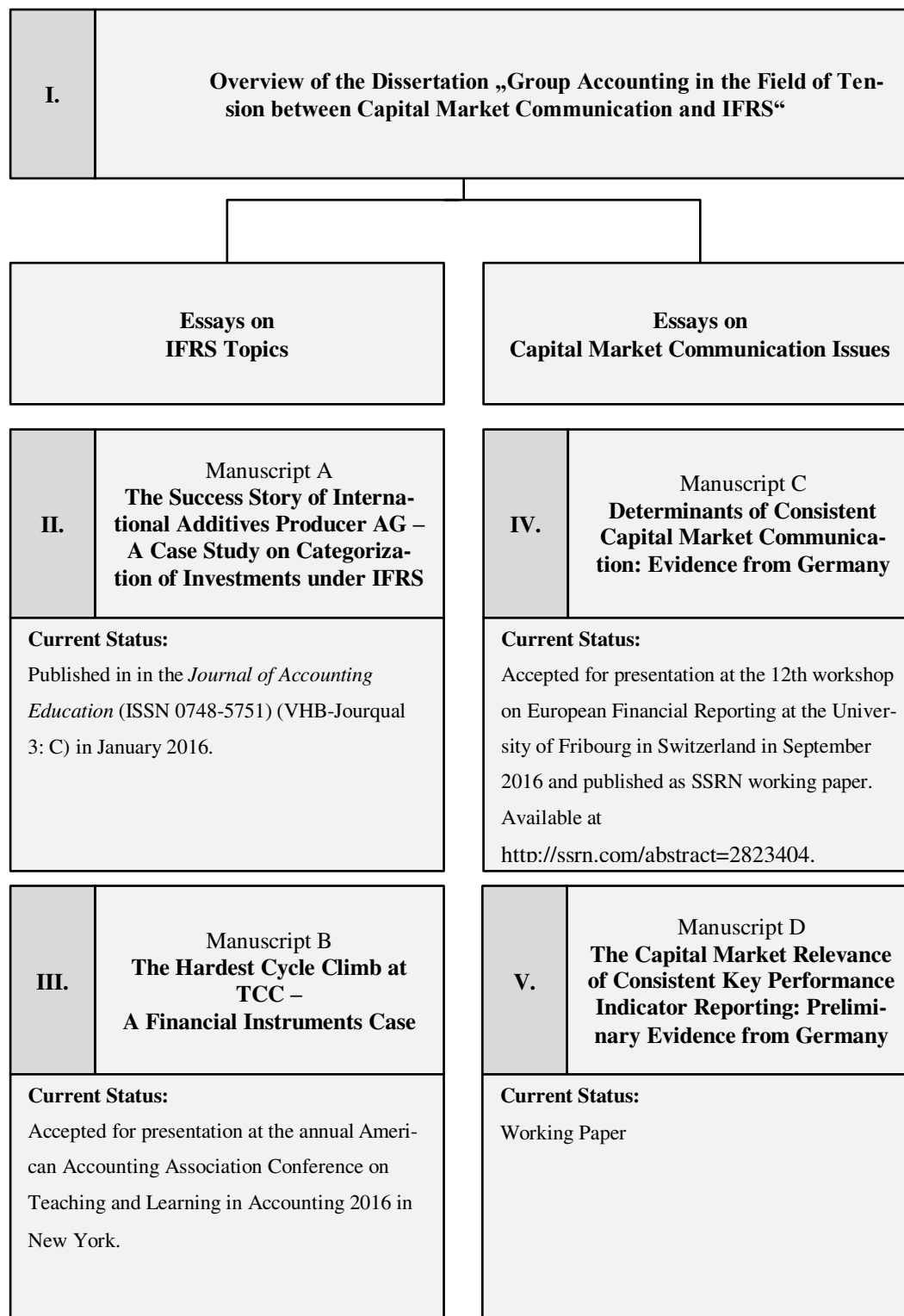


Figure 1: Overview of the dissertation

2 Overview and Findings of the Manuscripts

Manuscript A “**The Success Story of International Additives Producer AG – A Case Study on Categorization of Investments under IFRS**” provides a comprehensive overview of the new consolidation standards under the IFRS and requires students to evaluate and discuss different group accounting scenarios in the light of capital market expectations and managerial incentives. The instructional resource is based around a company called International Additives Producer AG (IAP) that recently announced ambitious forecasts regarding revenue and operating income to the capital market. These key performance indicators depend on the way IAP’s investments are currently accounted for in its consolidated financial statements, which are questioned by the newly appointed auditor. In this context, the case requires the application of the relevant IFRS regarding the categorization of investments for group reporting purposes. Specifically, Part I requires the application of the control concept of IFRS 10 as well as the classification rules of IFRS 11 for joint arrangements, while Part II introduces the assessment of significant influence according to IAS 28. The case nurtures the critical thinking of students in respect of economic consequences triggered by technical accounting decisions. Through this goal, the case enhances the understanding of the economic concepts and theories that underlie financial reporting (see Barth, 2008). Previous cases (e.g. Carslaw & Purvis, 2007; Nurnberg & Schaefer, 2010; Kratchmann & Smith, 2011) focus on consolidation issues without embedding it in the contextual background of managerial incentives and capital market expectations.

After several successful implementations of the instructional resources at the HHL Leipzig Graduate School of Management in various accounting courses, the manuscript was published in the *Journal of Accounting Education* (ISSN 0748-

5751) (VHB-Jourqual 3: C) in January 2016. The manuscript is co-authored with Henning Zülch and Torben Teuteberg. The development of the research question as well as the design and preparation of the manuscript, including the case study, teaching notes as well as recommended solutions, has been conducted collaboratively by Torben Teuteberg and the author of this dissertation. Henning Zülch provided supervision and mentoring throughout the manuscript development process.

Manuscript B **“The Hardest Cycle Climb at TCC – A Financial Instruments Case”** is built around TCC AG, a fast-growing bicycle production company headed by an ambitious top management team aiming to reinforce the growth strategy with a sophisticated financial funding scheme. Building the case on a corporate restructuring scenario allows the lecturer to discuss the interdependencies between complex accounting for financial instruments, the mechanisms of financial restructurings, and related theories on capital structure. To achieve this, students need to apply their knowledge to a diverse set of case scenarios involving financial instruments and are challenged by considering the wider economic consequences resulting from TCC’s corporate funding strategy. Although there are case studies that cover the accounting treatment of capital measures, such as stock buybacks (Kimmel & Warfield 2008; Mohrmann & Stuerke 2014) or preferred stock issuances (Margheim 2008), all these cases deal with isolated accounting decisions. This manuscript is the first comprehensive educational resource that deals with complex financial instrument accounting according to the IFRS in a financial restructuring case environment. The case targets the specific needs of an integrative accounting and finance curriculum, raising students’ awareness of the

economic consequences of accounting decisions (Bianco, Levy, Marcel, Nixon, & Osterheld 2014).

To date, the author of this dissertation has successfully implemented the case study three times at HHL Leipzig Graduate School of Management in the M.Sc. program. The manuscript has also been submitted to *Issues in Accounting Education* (ISSN 0739-3172) (VHB-Jourqual 3: C). Having received constructive feedback, the manuscript was revised, whereafter it was submitted and accepted for presentation at the annual American Accounting Association Conference on Teaching and Learning in Accounting 2016 in New York. The authors intend to submit the revised paper to the *Journal of Accounting Education* (ISSN 0748-5751) (VHB-Jourqual 3: C). The manuscript is co-authored with Henning Zülch and Josefine Böhm. The development of the research question as well as the design and preparation of the manuscript, including the case study, teaching notes as well as recommended solutions, was conducted collaboratively by Josefine Böhm and the author of this dissertation. Henning Zülch provided supervision and mentoring throughout the manuscript development process.

Manuscript C “**Determinants of Consistent Capital Market Communication: Evidence from Germany**” investigates the level of consistency in using financial key performance indicators (KPIs) in capital market communication in Germany and examines determinants of consistent KPI reporting. We developed three unique item-based disclosure indices to analyze the consistency of capital market communication of German companies spanning the period from 2009 to 2014: Consistency index for management report (CI_{MR}); Consistency index for annual report (CI_{AR}); Consistency index for capital market communication (CI_{CMC}). The indices are built on each other: the CI_{MR} covers the management report according

to HGB, while the CI_{AR} measures the consistency of the annual report, including the CI_{MR} and the KPI reporting of the segment reporting according to IFRS 8 of the consolidated financial statements. The CI_{CMC} covers the annual report, including the management report and segment reporting, plus the investor relations presentations for year-end earning calls. We find a high level of inconsistency in financial KPI reporting concerning all three analyzed parts of capital market communication. The average consistency in the period 2009 to 2014 was 46% for CI_{MR} , 50% for CI_{AR} , and 50% for CI_{CMC} . Broadly speaking, the companies discussed and reported the KPIs only in 46% or 50% of cases in which the discussion and reporting would have been appropriated. We are able to show that the level of consistency improved from 2009 to 2014. Our multivariate analysis indicates that since the application of an improved German Accounting Standard (GAS 20) on management reporting in 2013, the level of KPI disclosure consistency has increased significantly. We also find evidence that companies with a high number of financial KPIs, and therefore a high level of reporting complexity, achieve higher consistency than companies with fewer than the average number of financial KPIs. In line with other empirical studies, we find support for the hypothesis that profitable companies on average report higher quality information (e.g. Akhtaruddin, 2005; Hossain & Mitra, 2004; Karim, 1996).

Our results support the IASB by drafting an internationally accepted accounting standard on management reports, which should be a big step towards eliminating inconsistency between KPI definitions in various reporting regulations. The finding that the GAS 20 clarification on management reporting significantly improved consistency confirms this argument. The findings regarding the firm-specific characteristics that drive consistency should help standard setters and regulatory

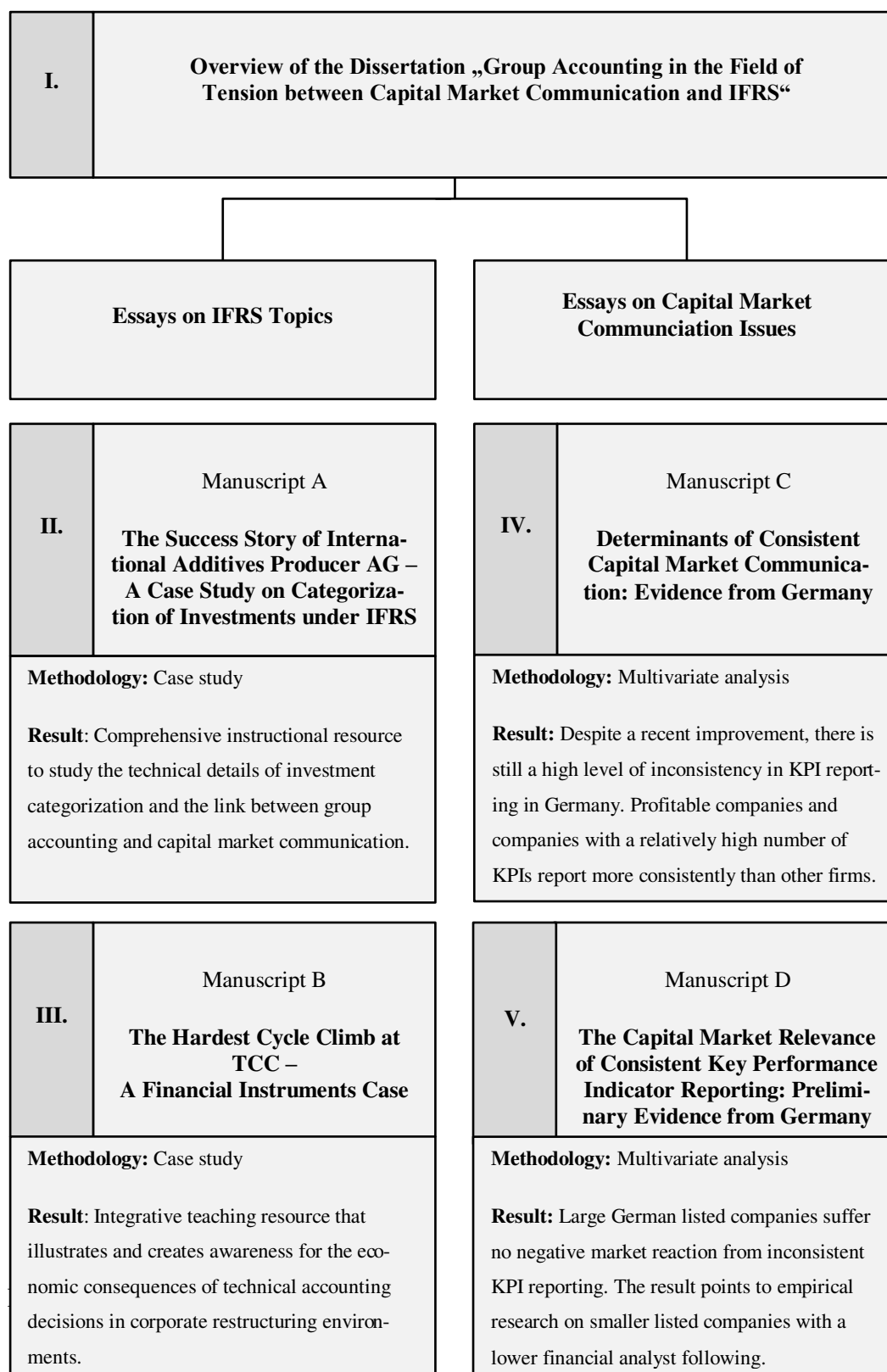
bodies to improve the regulatory setting of KPI reporting. Of particular interest should be the finding that firm size is not a strong explanatory variable of consistent reporting.

The manuscript is intended for publication in a scientific accounting journal such as *Accounting in Europe* (ISSN 1744-9480) (VHB-Jourqual 3: C). The submission is planned soon after the dissertation is completed. An earlier version of this manuscript was accepted for presentation at the 12th workshop on European Financial Reporting at the University of Fribourg in Switzerland in September 2016 and has been published at the Social Science Research Network (www.ssrn.com). The paper is co-authored with Stephanie Jana and Henning Zülch. The development of the research question, the execution and discussion of the multivariate analysis, and the preparation of the manuscript were conducted by the author of this dissertation. Stephanie Jana was mainly involved in the preparation of the structured literature review of this study. Henning Zülch provided supervision and mentoring throughout the manuscript development process.

Manuscript D “**The Capital Market Relevance of Consistent Key Performance Indicator Reporting: Preliminary Evidence from Germany**” provides preliminary empirical evidence of the economic consequences of consistent KPI reporting by German companies. To test consistent KPI reporting, I use self-constructed consistency indices of the largest German listed companies, as introduced by Jana et al. (2016). Following other empirical studies on the economic effects of disclosure quality, I measure firm value as the ratio of market value of equity to the book value of equity (Hassan et al., 2009; Lang et al., 2003). My results do not show a significant association between firm value and the level of consistency in the management report (CI_{MR}) and capital market communication (CI_{CMC}). The

results regarding CI_{AR} show a negative significant relationship between the level of consistency in the annual report and the firm value. Although these results contradict my original hypotheses that consistent KPI reporting has a positive impact on the market value of a company, I am able to put these findings into perspective. In particular, I argue that a main limitation of my sample is the relatively high analyst following of our analysed companies. Due to the advanced financial proficiency of financial analysts, a link between the disclosure quality of capital market communication and firm value can be statistically insignificant (Botosan, 1997). Furthermore, I argue that the negative links between consistent KPI reporting can be explained by management incentives to hide KPI information for profitable segments in capital market communication (Bugeja et al., 2015). I suggest future research directions based on these findings.

The manuscript is still a working paper. It is the intention of the submitting candidate to revise and develop the manuscript with members of the Chair of Accounting and Auditing at HHL Leipzig Graduate School of Management.



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II.

The Success Story of International Additives Producer AG – A Case Study on Categorization of Investments under IFRS

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III.

THE HARDEST CYCLE CLIMB AT TCC – A FINANCIAL INSTRUMENTS CASE

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III. THE HARDEST CYCLE CLIMB AT TCC - A FINANCIAL INSTRUMENTS CASE

Abstract

TCC AG is a fast-growing bicycle production company and is headed by an ambitious top management team which wants to reinforce the expansion strategy with a sophisticated financial funding scheme. However, as a result of a steep decline in profits, the finance strategy unexpectedly poses an existential threat to TCC. Complex accounting questions which TCC's top management consequently has to face include the likely breach of a financial covenant, the detailed contractual clauses of a prospectus and the execution of a debt-for-equity swap. The accounting requirements cover the recognition, the measurement and the disclosures of non-derivative financial instruments according to International Financial Reporting Standards (IFRS). To foster a holistic understanding of financial instruments, the educational resource further combines the accounting concepts with related corporate finance theory. With this integrative approach, the case intends to encourage students' critical reflection upon the far-reaching economic consequences resulting from accounting decisions.

Keywords: Financial instruments, restructuring, debt-for-equity swap, covenant, IFRS

1 Case

1.1 Introduction

From his office, Stephen Mayer was watching the third shift of workers arriving at the site of “The Cycle Company” – TCC in short – Germany’s leading bicycle manufacturer. Located in the sleepy town of Teterow, out in the county in Mecklenburg-Western Pomerania, TCC was not only the most important employer of the region but also received exceptional news coverage. With its successful turnaround strategy from a low-cost bicycle producer to Germany’s avant-garde manufacturer of high-quality and electric bikes, TCC regularly hit the national headlines of the leading business newspapers reading:

[Figure 1 about here]

For TCC to accomplish its turnaround strategy, significant investments into new production lines and software as well as the acquisition of a startup company were necessary. To raise the required funding, various external sources had to be tapped introducing a new complexity to TCC’s corporate finance and accounting departments. Working long hours had therefore become the new norm for Stephen, the CFO of TCC. However, tonight Stephen is observing the working crowd with a, for him, unusual trace of resignation as July 15, 2014 could enter into TCC’s history as the sudden turning point of its success story.

In the afternoon, the German postal service announced that it had started to develop and produce its own bike series for its crew of postmen. Consequently, neither the envisaged regular production of 20 000 high-quality bikes nor the special order of 15 000 e-bikes would be allocated to TCC. The cancelation came as a shock since the German postal service had been one of TCC’s major clients. They

had regularly ordered a great batch of custom-made bicycles that were expected to contribute nearly 30% of revenues and 50% of profits in 2014.

An emergency meeting with Peter Schulz, head of accounting, uncovered even more bad news: Due to the drastic collapse in forecasted income, some of TCC's contractual loan agreements would be breached triggering the early repayment of a significant share of the company's debt by the end of the year. After the evening session with Peter, Stephen was sorting his thoughts trying to find a way out of the seemingly hopeless situation that could drive TCC into bankruptcy. Although he felt tired of going through the corporate finance toolbox again to make TCC's strategy work, he was sure that capital and financial restructuring measures would be at the very top of his agenda for the coming months.

A knock on the door from his personal assistant, who wanted to call it a day, interrupted his pondering: "Could you just get me Thomas on the phone before leaving?" Stephen needed to desperately discuss his thoughts with someone. After three rings, Thomas answered the phone with "Silverman Sachs, capital markets advisory, Thomas Claasen speaking." – "Hi Thomas, this is Stephen."

1.2 Background

Founded as a family business in the 1870s, TCC had produced bicycles consistently for the past 140 years spanning all different kinds of clients from the Prussian postal service in the Wilhelminian era to the racing cyclists of the 1972 Summer Olympics. In the 1990s, TCC shifted its focus from the complete production of two-wheelers to the pure assembly of bicycle parts that, in the course of globalization, could be imported at a much lower cost from the Eastern European and Asian markets.

Following a mass production approach, TCC continuously expanded its output and gained a market share of a quarter of the total German bicycle production. Thereby, the majority of TCC's production output consisted of low-budget city and mountain bikes that were sold to German discounter chains. To generate profits in this very low margin business, the assembly processes were geared towards efficiency and working capital management was declared a top priority. Nevertheless, to secure favorable pricing in the international markets, bicycle parts were procured in batches weighting heavily on TCC's inventory position while the payment terms were largely dictated by the discounter chains limiting TCC's influence upon receivables.

Although TCC generated positive returns due to its large production output and the resulting economies of scale, profits had stagnated in recent years. To trigger a new phase of earnings growth, TCC decided in 2011 to exploit the potential of higher priced racing and city bikes. Industry experts had long predicted great expansion opportunities in this segment as the two-wheeler was expected to turn into a lifestyle product. Convinced of the growth outlook; TCC started building a new assembly line that – with the promise of regional job creation – was financed by the business development bank of Mecklenburg-Western Pomerania.

While the construction proceeded smoothly, the company faced great challenges with designing a lifestyle product, establishing it in the market and finding the appropriate distribution channels. Only with the German postal service could a major order be arranged that was in need of high-quality, tailor-made bicycles for its crew of postmen. To advance its product placement capabilities and polish up its stale brand reputation, TCC acquired the trendy Berlin-based bike and e-bike startup, ESpeed, in June 2012. The transaction was financed with the stock-listing

of TCC in the beginning of 2012 that was also used by the then controlling shareholders to exit their engagement. Due to the good relation to the target, the takeover was executed in a timely fashion and all accounting implications were processed by the end of 2013.

As part of the takeover agreement, the target's founder, Andreas Mann, became the new CEO of TCC and the personifying figure of the company's turnaround strategy. As the CEO's first act, ESpeed's well-known brands were rolled out in TCC's new production facilities, multiplying the output of the highly demanded bikes. To further integrate and expand ESpeed's margin-rich e-bike production, Andreas Mann was planning on a second new assembly line to be built in 2014, for which funding was still needed. Since TCC's cash reserves were strained by the interest payments for the loan of the business development bank, external funds would need to be raised in order to stabilize TCC's financial situation and to invest in the next expansion phase.

TCC has a credit rating of BBB- and prepares its consolidated financial statements according to the International Financial Reporting Standards (IFRS). Its fiscal year covers the months from January to December.

1.3 One Year Ahead of the Crisis...

Since nine o'clock sharp, Stephen was waiting for the CEO, Andreas Mann, known as Andy, who was already running five minutes late. The two had arranged an appointment to go over Andy's storyline for the meeting with Thomas Claasen. Thomas was an old university friend from Stephen's days at EAA Business School who was now working in the capital markets advisory division of the investment bank Silverman Sachs in London. Just three months ago, they had met at

an alumni gathering in Barcelona, where Thomas talked extensively about his new girlfriend and to Stephen's greater interest, about his unusually empty deal pipeline.

When Stephen told him that TCC was in need of capital to finance its e-bike expansion strategy, they decided to stay in close contact and after consultations with Andy set up a meeting in TCC's headquarters for today, September 12, 2013 at 11 am. Stephen felt very content about the forthcoming collaboration with Thomas as, on the one hand, he trusted in the fairness and support of his old university friend during the deal. On the other hand, Silverman Sachs was one of the best known market intermediaries providing TCC access to a promising pool of funding. Just recently, Silverman Sachs had launched a new broker platform targeted at companies in the lower ranks of investment grade ratings. In times of zero interest yields, investors' increasing risk appetite encouraged such placements and Thomas was keen to stand up as a rainmaker and present TCC in front of the board of Silverman Sachs.

Ten minutes past nine, the bell of the elevator rang and Andy exited accompanied by the newest trial version, the trendy e-bike TX5005 that he was testing as a pilot driver. In a good mood, he passed his personal assistant and entered his office greeting Stephen with a: "Sorry for running late, so much traffic this morning!" Stephen tried his best to respond with a smile as one actually needed to search for cars on the empty roads of Teterow. After Andy's obligatory first cup of coffee, the two finally got down to preparing today's presentation.

1.3.1 The Funding Tactics

For Thomas to get a more detailed picture of the company, a virtual data room was established containing all types of documents like TCC's annual reports, its recent budget plans, its loan contracts and its articles of association. Although Stephen knew most of these documents, he also needed to prepare for the meeting. First and foremost, he had to gain a better understanding of how the different types of funding instruments would affect TCC's corporate finances. He was especially focused on the leverage ratio, as he knew that an increase would further deteriorate TCC's rating and raise its capital costs due to the adverse effects of indebtedness.

To enter the negotiations thoroughly prepared, Stephen instructed Peter Schulz, head of accounting, to evaluate the most likely funding scenarios. Peter explained during the CFO briefing that in a first scenario a bond could be issued. This would raise TCC's leverage ratio and as the instrument was expected to trade on the broker platform of Silverman Sachs, the bond enter the balance sheet at its prevailing market value in each reporting date. Any fair value adjustments would be included in the income statement and change the amount of equity thus impacting TCC's leverage ratio. Although Stephen knew it would be an uphill battle to explain to the other executive board members why the fair value adjustments impact TCC's financial performance, he was convinced that issuing a bond on the broker platform would be proof of TCC's professionalism in the corporate finance sphere.

Regarding the capital costs of the instrument, Peter was advocating a zero bond to avoid further straining the company's cash flows on top of all the ongoing investments. Nevertheless, a zero bond – of this Peter was sure – would still im-

pact the income statement although no cash interest payments would occur. As soon as the terms were known, he would definitely need to dive into the exact calculation approach!

In a second scenario, Peter was considering a mezzanine funding instrument called a participation certificate that was a particularity of the German capital markets. The certificate's payments were usually fixed but also included a step up clause in the form of a right to participate in a company's profits. Peter recalled that this alternative construct would classify as equity if (1) the maturity of the participation certificate was perpetual, (2) TCC held the right to terminate the certificate and (3) the full amount of payments was triggered by the distribution of dividends to common shareholders.

The head of accounting proclaimed that the charm of the latter solution was twofold: On the one hand, the equity instrument would improve TCC's capital structure due to its classification as equity. On the other hand, the full amount of annual costs could be influenced by TCC because the participation rights would be directly linked to the company's dividend policy. Peter dived further into the logic explaining that in years of greater investment needs, TCC could decrease its distributions to shareholders and in this way, also lowers its payments to participation holders. Therefore, TCC would be able to retain enough capital to internally fund its strategic initiatives – also with the participation certificates! Combined with the infinite lifetime of the mezzanine instrument that could be terminated only by TCC the contractual obligation for repayment could be managed very flexibly.

Even without looking into the numbers, the outlined options mixed with the accounting jargon sounded quite complex to Stephen. For the negotiations

with Thomas, he decided to stick to his key take-away of Peter's briefing, namely to link the annual repayments of the new investments to TCC's dividends. To Stephen, this appeared to be the optimal financing strategy as it would grant the company a great degree of financial leeway in the years of its ambitious e-bike expansion project.

1.3.2 The Negotiation

Thomas arrived punctually at the production site with a cab from Rostock airport. Stephen greeted him personally at the entrance of the administration tower and guided him up to the conference room, where Andy was already waiting. After distributing the slides and going through the agenda, Stephen handed over to the CEO who started to supplement the sales figures with his story on TCC's past turnaround strategy from a producer of low-budget to high-quality bikes. He continued his presentation by talking about the next milestone: the expansion into the e-bike segment that was expected to generate sales of 40 000 e-bikes in 2014 and 80 000 by 2018.

With the intention of preparing the following negotiation session, Stephen politely interrupted the strategic part of the presentation leading over to the financials with the question: "And what does the boost in sales mean for TCC's results? This brings us to the next slide."

[Figure 2 about here]

Stephen illustrated that with the expansion into the margin-rich e-bike segment, TCC would not only expand its total volumes sold but also planned to double its EBITDA results with a target of €10 million for 2014 and net income of €5.4 million. For the following years, the slide showed a continuous increase in

EBITDA and net income, of which more than half was assumed to be distributed to TCC's shareholders. Stephen used the promising profit forecasts to announce his proposal: "With TCC's growth outlook, we see great potential for investors to participate in the company's success and therefore, suggest funding our capital needs with participation certificates."

Thomas seemed surprisingly content about the proposal, but asked for a short break to undertake some calculations mumbling: "Assuming a nominal amount of €35 million, a risk-adjusted interest rate of approximately 7% and a maturity of five years..." After a couple of minutes, the negotiations resumed. Thomas reopened the meeting explaining that the terms looked acceptable to him but as Silverman Sachs would underwrite the issue he needed to reconfirm with the risk guys back in London. From experience, he was already sure that they would want a covenant as to better monitor the financial situation of TCC for the duration of the investment.

Concretely, Thomas was advocating the interest coverage ratio, being defined as EBITDA over total interest expenses, as a covenant. To bring the well-developing negotiations to a concise conclusion, Stephen reassured that such a contractual add-on should not be a problem. TCC was already following this ratio very closely in its internal reporting systems because of its loan agreements with the business development bank of Mecklenburg-Western Pomerania.

Thomas remembered having seen the loan documentation in the data room but asked Stephen to remind him of the exact conditions. The CFO recalled the key points of the contract: "€10 million borrowed in January 2011 at an annual interest rate of 7% and with a maturity of 10 years including the covenant ratio

EBITDA over net interest expenses with a threshold level of 350%. If the ratio falls below this level, the bank has the right to withdraw its funding.”

Again Thomas sank into calculations, but after a few seconds concluded: “Ok, that should be fine. We would include a not that restrictive threshold level of 250%. As to the other terms, I will talk to my colleagues and get back to you, Stephen, with the final terms within the next weeks.” After closing the meeting, Andy insisted on showing Thomas the production facilities. However, Thomas had to catch the next flight and get back to his office for an all-nighter.

One week later, Thomas sent the contract and the prospectus for the upcoming road shows. In his e-mail, he expressed his confidence in being able to raise the €25 million within the coming months or during the expected Christmas rally, at the latest. For its advisory and issuance services, Silverman Sachs would charge a transaction fee of 1% of the nominal value of the bond. With the exact documentation and a copy of the signed contract in hand, Stephen asked Peter to double-check the papers. However, the head of accounting proclaimed not to be an expert on the complex classification of financial instruments and proposed to get an external opinion. Therefore, Stephen approached a trusted financial auditor who directly classified the issued financial instrument as a liability.

The CFO was surprised by this outcome as according to the external opinion the initially assumed equity instrument somehow had turned into a financial liability. He wondered where Peter had gone wrong in his assessment. Or did Stephen miss out on something amongst all the complex accounting assertions? Should he have asked Peter to join the meeting?

1.4 Can Financial Restructuring Avert the Crisis

Stephen was relieved to hear his old friend at the other end of the line and continued the conversation: “I am calling as we have a problem here at TCC and at this late hour I better get straight to the point.” – “Sure, fire away Stephen. I am all ears.” Stephen briefly illustrated the happenings of the day with the order cancellations of the German postal service. He knew that he would not need to go into the details in order to receive a well-founded advice as Thomas had extensively studied TCC’s financials for the bond issue one year ago.

Therefore, Stephen focused his description on the effects of the lost customer. He explained that although the negative accounting consequences concerning impairments could be held at a minimum, the sales collapse in the margin-rich bikes segment would weigh heavily on the company’s EBITDA figures for 2014 and the foreseeable future. Combined with the higher interest expenses due to the bond issue, TCC’s adjusted forecasts predicted a breach of the loan covenant with the business development bank.

[Table 1 about here]

According to the contractual agreements, the breach would grant the counterparty the right to reclaim the outstanding loan by the end of the year. However, within just four months, TCC would not be able to raise the necessary capital especially not in its current operational crisis. Thomas had a fast solution at hand: “Get rid of the loan by executing a debt-for-equity swap! The terms are much too restrictive – quasi a relic of the financial crisis. However, that said, I would not get involved in renegotiations of the conditions or even a postponement of the financial covenant. In the end, you might even have to report this mess and

thus raise uncertainties in the capital markets. Just get the loan swapped into tangible equity before the end of the reporting period. The number of new shares should definitely lie within the ranges of your articles of association so that you don't even need a shareholder vote."

[Table 2 about here]

To Stephen, the call uncovered a, to date, unconsidered way out of the imminent bankruptcy. He asked Thomas to put together an official document with a summary of the necessary actions so that Peter could prepare the negotiations with the business development bank. Stephen ended the call by insisting on a bill for the probably company-saving advice.

Calmed down, Stephen left his office shortly before midnight. After a good night sleep, he would arrange a meeting with the bank tomorrow. Then, TCC's future and the jobs of 1 200 people would lie in the hands of the county of Mecklenburg-Western Pomerania.

1.5 Requirements

1.5.1 Presentation of Financial Instruments

- 1) Please provide the definition of a financial instrument according to the International Financial Reporting Standards (IFRS).
- 2) What are the prerequisites according to IAS 32.11 and IAS 32.16 to classify a financial instrument as equity? Please ignore the specific exemptions in IAS 32.16A-F for your answer.
- 3) Do you agree with Peter that the participation certificate discussed in the CFO briefing classifies as equity? For your answer, interpret how the fol-

lowing three characteristics influence TCC's *contractual obligation* according to IAS 32.16 (a):

- (1) The issuer's right to terminate the participation certificate.
 - (2) The determination of the amount of the participation.
 - (3) The maturity of the participation certificate.
- 4) Consider the final terms of the participation certificate in the prospectus and explain:
 - (1) Why the financial auditor classifies the participation certificate as a liability.
 - (2) What role the included financial covenant plays for the classification according to IAS 32.25.
- 5) What is the correct accounting treatment of the debt-for-equity swap according to IFRIC 19? Please provide the booking entries for the transaction detailed in Table 2.

1.5.2 Measurement of Financial Instruments

- 1) Is Peter right that the fluctuating market values of the bond have to be reflected in the income statement? What alternative accounting treatment would be possible?
- 2) Due to the zero bond structure of the bond, TCC has to apply the effective interest method according to IFRS 9.B5.4.1-B5.4.7. Please complete the table below assuming that no dividends will be paid by TCC for the duration of the bond.

Fiscal Year	Opening Balance in €	Interest Expenses in €	Closing Balance in €
2014			
2015			
2016			
2017			
2018			

- 3) Calculate the interest coverage ratio for the years 2014 and 2015 as defined in the prospectus in Figure 3 of the appendix. Include the EBITDA forecasts of Figure 2 in your calculations.
- 4) How does the sales collapse impact the interest coverage ratio? Please use the revised income statement from Table 1 for your calculations.

1.5.3 Disclosure of Financial Instruments

- 1) Why is Thomas pressuring to close the debt-for-equity swap before the end of the fiscal year? What disclosures would otherwise be needed according to IFRS 7.18-19?
- 2) What year-end fair value disclosure would be necessary for the loan according to IFRS 7.25?

1.5.4 Related Corporate Finance Issues

- 1) What is the optimal leverage ratio for TCC according to the *Modigliani and Miller proposition I*?
- 2) Please challenge your conclusion from D.1 with the *trade-off theory*.
- 3) What kind of signals do equity issuances convey to the capital market?
Please discuss your answer within the *pecking order theory*.
- 4) Which corporate finance measure does TCC use to resolve the capital structure issue? Which of the above capital structure theories best explains TCC financial restructuring decision?

Appendix

Figure 1: Exemplary newspaper excerpts of TCC

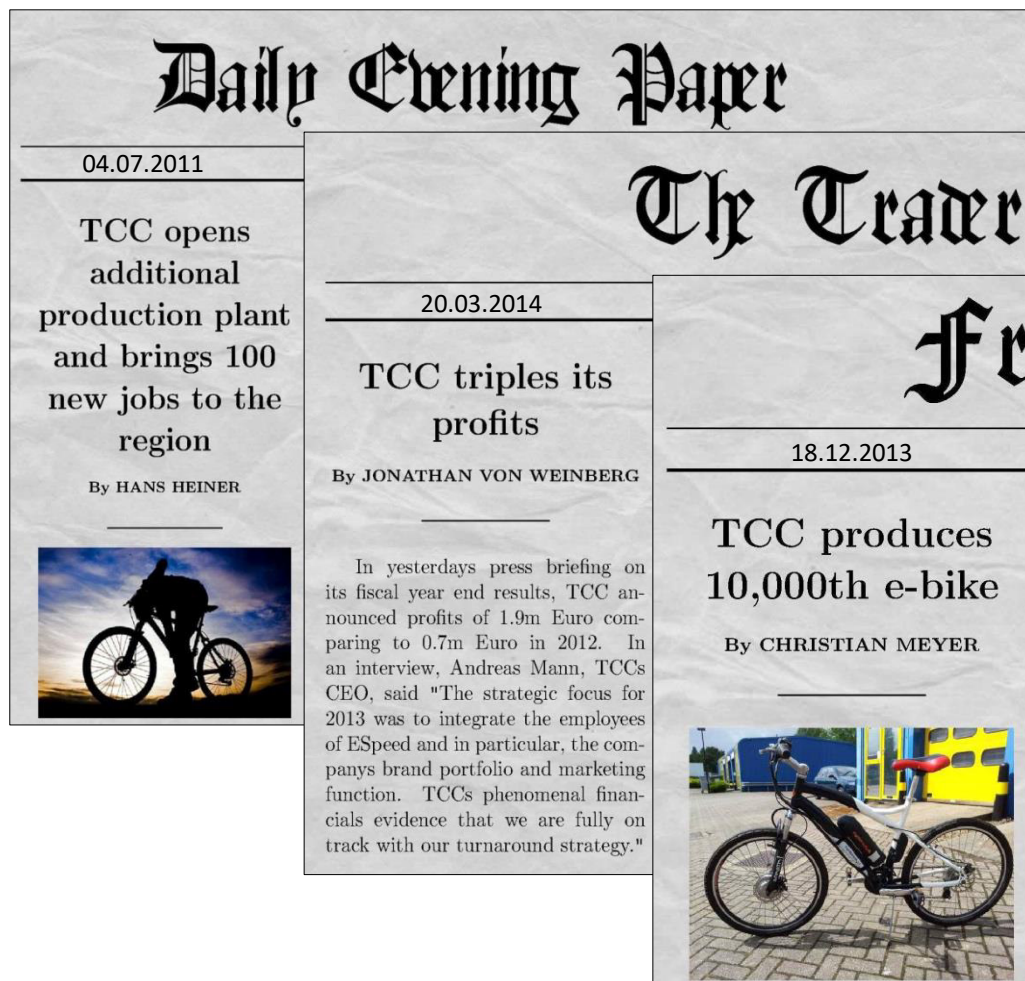


Figure 2: Selected income positions, 2012-2018e

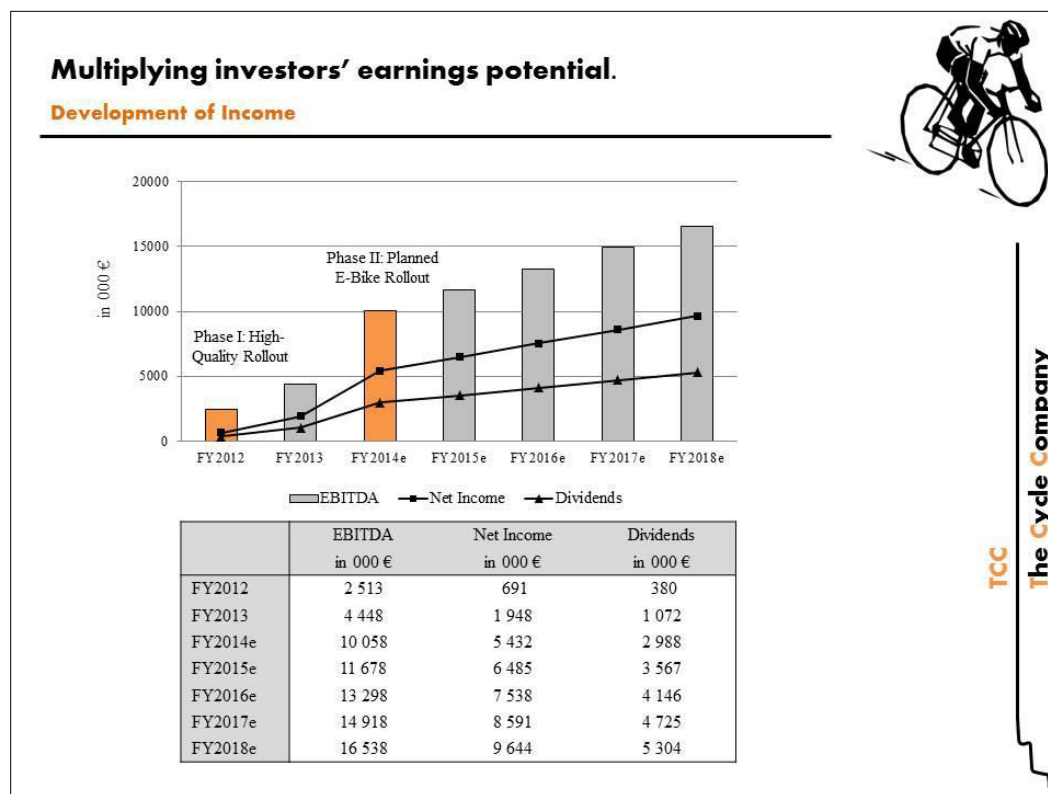


Figure 3: Participation certificate conditions (Excerpts of the prospectus)

Issuer:	The Cycle Company
Specified Currency:	EURO
Nominal Amount:	35 000 000
Issue Amount:	25 000 000
Issue Date:	01.01.2014
Maturity Date:	31.12.2019
Interest Basis:	Zero Coupon

§ 9

(Termination of Participation Certificates)

1. During the lifetime of the instrument, TCC reserves the right to terminate the participation certificates at the end of each calendar year, with the first date being 31.12.2014.
2. In the event that the interest coverage ratio should amount to less than 250%, the holder is granted the right to terminate the certificate and demand immediate redemption.

“Interest coverage” ratio is thereby defined as (1) earnings before interests, taxation, depreciation and amortization over (2) net interest expenses of the consolidated financial statements. Net interest expenses equal the sum of all interests, compensations and commissions that relate to the liabilities recognized in the balance sheet, irrelevant of whether these costs are capitalized or expensed.

§ 10

(Determination of Participation Right)

1. Starting from fiscal year 2014, holders of the certificate will additionally receive a right to participate in TCC’s profit development. The yearly payment will amount to 35% of paid cash dividends per common share.
2. Should no dividends be distributed to common shareholders, TCC is also not required to make any payments to the holders of the participation certificate.
3. In case of a negative consolidated net income, no share of loss will be attributed to the holders of the certificate.

Table 1: Revised income statement for 2014e

in 000 €	2014e
Sales	118 250
EBITDA	7 328
EBIT	6 328
Net Income	3 658
Dividends	0

Table 2. Term sheet debt-for-equity swap

in 000 €	As of July 2014
Book Value Loan	10 000
Fair Value Loan	8 000
Fair Value of Additional Equity	8 000
Advisory Fees	100

2 Case Learning Objectives and Implementation

Guidance

The subsequent sections discuss the motivation, the learning objectives and the contribution of the underlying accounting case. Furthermore, we complement our assertions with the feedback that was received from students as part of testing the effectiveness of our case. In the remainder of the section, we share our experience in terms of the successful implementation of the instructional resource. The teaching notes with the recommended solutions to the individual requirements can be requested directly from the authors.

2.1 Case Motivation and Learning Objectives

The case is built around TCC AG, a fast-growing bicycle production company and headed by an ambitious top management team which wants to reinforce the growth strategy with a sophisticated financial funding scheme. Whereas the characters and the dates of events are fictitious, the accounting challenges resulting from financial restructurings are derived from real-life situations. Anchoring the case in a corporate scenario of financial distress²⁷ allows the lecturer to discuss the interdependencies between the complex accounting for financial instruments, the mechanisms of financial restructurings and the related theories on capital structure.

²⁷ In our definition of “financial distress”, we follow Ross, Westerfield and Jaffe (2005) who state: „Financial distress is a situation where a firm’s operating cash flows are not sufficient to satisfy current obligations [...]. Financial distress may lead a firm to default on a contract, and it may involve financial restructuring between the firm, its creditors, and its equity investors” (830).

Students are introduced to the commonly applied corporate finance toolset of financial covenants and of debt-for-equity swaps. Both play a central role in the restructuring context where financial covenants as contractually agreed upon monitors of the borrower's profit and liquidity situation can act as early warning signals of potential financial bottlenecks (Nash, Netter, and Poulsen, 2003). Alongside such measures as time extensions or waivers on debt repayments, debt-for-equity swaps, on the other hand, represent a common out-of-court procedure to revert an imminent illiquidity crisis (Weston, Mitchell, and Mulherin 2004).

Aside from their importance within the realms of financial restructuring, we decided to implement these tools in our story so that an integrated understanding of the accounting for financial instruments could be fostered. To achieve this purpose, students need to apply their knowledge to a diverse set of case scenarios involving financial instruments and are challenged by considering the wider economic consequences resulting for TCC's corporate funding strategy. A first such consequence is triggered by the classification of the newly issued financial instrument as a liability (instead of equity) that raises TCC's interest expenses and, combined with the revenue decline, leads to the breach of a financial covenant. The infringement, in turn, initiates the need for financial restructuring whereby the imminent crisis can be resolved by exchanging the loan into equity. Students are thus faced with a reclassification scenario.

The authors' teaching experience has shown that students are so caught up in the accounting technicalities for financial instruments that they lose sight of the broader economic consequences that result from a change in capital structure. In order to be well prepared for the practical realities, however, an in-depth knowledge of accounting for financial instruments should cover not only their

respective recognition and measurement but also their effects for contractual relations with lenders, for the capital markets communication and for the value of the firm itself. Therefore, we chose an integrated case approach that not only spans the recognition, measurement and disclosure of financial instruments but also shows the economic consequences of accounting decisions. That there is a great need for such an integrative approach is emphasized by Bath (2008) who states:

Financial reporting educators also need to ensure their students learn the foundational theories that underlie financial reporting. These theories include micro- and macro-economics, finance, information economics, the role and effects of incentives, rational expectations, and portfolio pricing. The conceptual framework states that the objective of financial reporting is to provide information useful for making economic decisions (IASB 2001, para. 12). Thus, it is clear that understanding economic concepts, including those relating to information for investors and creditors, is fundamental to understanding financial reporting (1164).

Accordingly, the learning objectives are as follows:

1. **To learn the accounting provisions for non-derivative financial instruments according to IFRS.**

The objective is achieved by applying the accounting standards IAS 32 and IFRS 9 for the initial recognition and the subsequent measurement of non-derivative financial instruments (part A and B of the requirements).

2. **To understand the interlinkages between recognition, measurement and disclosure of non-derivative financial instruments under IFRS.**

Students learn that the subsequent measurement of financial instruments is determined by their initial recognition (part A and B) and that business incidents trigger disclosure requirements (part C of the requirements).

3. **To raise students' awareness for the economic consequences of accounting decisions on non-derivative financial instruments.**

This objective is achieved by showing how decisions on the classification and measurement of non-derivative financial instruments can affect relations with capital providers (in the form of financial covenants – part B) and the firm's capital structure as a whole (part D of the requirements).

4. **To study the common financial restructuring measure of a debt-for-equity swap and its accompanying accounting treatment.**

Students get to know the common restructuring tool of debt-for-equity swaps whose implications are evaluated from both an accounting (part A) as well as a corporate finance perspective (part D of the requirements).

5. **To strengthen students' analytical skills by having them assess different negotiation outcomes and the corresponding business consequences.**

With the case, students learn to critically assess different business scenarios and are asked to evaluate the outcomes from both an accounting perspective (part A) and from a corporate finance perspective (part D of the requirements).

2.2 Case Development and Contribution

Although the International Accounting Standard Board (IASB) has overhauled the IFRS on financial instruments completely within the last ten years²⁸, the standards still pose a huge challenge for students, practitioners and standard setters. These challenges stem from the inherent complexities and the ongoing amendments of the financial instrument standards (Ernst & Young 2015). Considering the useful-

²⁸ IFRS 7 was published in 2005 and replaced disclosure requirements previously incorporated in IAS 32. The IASB subsequently published versions of IFRS 9 that introduced new classification and measurement requirements (in 2009 and 2010), a new hedge accounting model (in 2013) and a final version in July 2014.

ness of case-based teaching (see Boyce, Williams, Kelly, and Yee 2001; Chen 2013) and the aforementioned educational and practical difficulties, the case at hand covers the most current IAS/IFRS on financial instruments: IAS 32 “Financial instruments: presentation”, IFRS 7 “Financial instruments: disclosure” and IFRS 9 “Financial instruments”.

In particular, IAS 32 attracts considerable attention from the standard setters and various interest groups (IASB 2008). One of the main reasons is its purpose to regulate the recognition of capital issuances as equity or debt in the financial statements. Therefore, the standard effectively determines the loss-absorption capacity of an economic entity. However, despite its central role, the standard is difficult to apply due to its widely criticized complexity (IASB 2008; IASB 2009) that mainly originates from the casuistic nature of the accounting standard²⁹ which as a matter of fact struggles to capture all existing funding structures. Keeping this shortcoming in mind, we added specific indications of the relevant accounting standards and paragraphs to the case requirements to ensure that students spend time on the application of accounting standards instead of on finding the correct paragraphs.

The requirements of part A encourage a detailed discussion on the recognition of financial instruments (IAS 32) asking students for the definitions of financial instruments and their applicability. Following the structure of accounting standards, the requirements continue with the subsequent measurement (IFRS 9) and the notes to the consolidated financial statements (IFRS 7) in parts B and C. This integrative approach of combining recognition, measurement and disclosure

²⁹ See, for example, the specific exemptions in IAS 32.16A – F.

along one business transaction is often missing in accounting text books and is consequently underrepresented in the curricula (Ruhl and Smith 2013).

As the central means to motivate students' interest in financial instruments accounting, the case highlights the importance of accounting decisions for the financial rescue of an operationally and later financially distressed firm (IASB 2009). All financial measures to avert the imminent illiquidity are centred on the core question of TCC's capital structure and funding strategy. Students working on the restructuring case experience how contract details change throughout negotiations and how important a continuous and proactive accounting assessment is for a successful financial restructuring.

There is one strand of recent case studies that covers the accounting treatment of capital measures such as stock buybacks (Kimmel and Warfield 2008; Mohrmann and Stuerke 2014) or preferred stocks issuances (Margheim 2008). Other cases are centred on derivative accounting as part of hedging relationships (Smith and Kolbeck 2008; Ebrahim, Schultz, and Hollister 2010). Whereas all of these cases deal with financial instruments, they are mainly focused on isolated accounting discussions according to US-GAAP and do not include an assessment of the resulting economic consequences.

To our best knowledge, the case at hand is the first comprehensive educational resource that deals with the complex financial instrument accounting according to IFRS in a financial restructuring case environment. The case targets the specific needs of an integrative accounting and finance curriculum raising students' awareness of the economic consequences of accounting decisions (Bianco, Levy, Marcel, Nixon, and Osterheld 2014). Therefore, we understand our case as an innovative contribution to the existing accounting education literature.

2.3 Implementation Guidance

The case was implemented in the course “Advanced International Financial Reporting” within the Master of Sciences program of the authors’ graduate business school. The course is an accounting elective with the learning objective to deepen students’ understanding of IFRS. Students at this stage of the curriculum are required to know the accounting basics and to have attended corporate finance classes dealing with the fundamental theories of capital structure and firm value. If students are not familiar with the fundamental theories of capital structure, the modular setting of the case requirements allows instructors to remove Part D. Nevertheless we encourage instructors to discuss the capital market theories at least briefly during the in-class discussion of the case, because the learning outcome seems – as intended by the case setting – to be positively impacted by integrating capital market theories and financial instruments accounting (see Student Assessment).

We provided students with the case and the relevant accounting standards four weeks before discussing the requirements in class. In order to set an incentive to work on the case at home and to participate in the case discussion, we informed students via the course outline that one-sixth of the final exam would relate to the accounting concepts covered by the case. To ensure a level-playing field of basic knowledge on the relevant accounting topics, we gave a comprehensive introduction to accounting for financial instruments one lecture before the in-class discussion. This mandatory preparation session on financial instruments accounting under IFRS took 90 minutes and this was sufficient for discussing all the requirements.

The discussion revealed that the understanding of the accounting technicalities was significantly improved due to the reflection of the economic consequences resulting from accounting decisions and judgements. All accounting aspects were analysed in the case framework of TCC's efforts to restructure its financial position for future growth. During the entire class, we encouraged students to discuss the corporate finance implications of the accounting decisions and asked whether and how accounting alternatives could be realized by TCC's management. Furthermore, the international heterogeneity of our graduate students inspired a discussion of the participation certificate in the context of different corporate governance structures. Due to the fact that for the majority of the students the discussed funding instrument was unknown students had to assess the extracts from the prospectus carefully and discuss the accounting consequences intensively during the in-class discussion. We asked students exam questions on case-related topics like the accounting of a debt-for-equity swap execution and the assessment of contractual clauses in regard to the IAS 32 classification. In previous accounting classes where no case-based teaching was implemented, the exams results for such financial instruments questions were significantly lower than the average results in these exams, which is in line with the observation that financial instruments accounting is highly complex (Ernst & Young 2015). Significantly improved exam results and students' oral feedback during class provided evidence that the integrated nature of the case-based teaching helped to achieve this learning outcome. The effectiveness of the underlying case was, however, further analysed with a structured survey, the results of which are presented in the following section.

While the authors chose the in-class discussion for case implementation, the structure of the pedagogical resource allows various alternatives. An in-class discussion that is moderated by the students themselves could be particularly effective as it would foster an independent elaboration of accounting issues. The answers to the different requirement blocks regarding recognition (A), measurement (B), disclosure (C) and corporate finance (D) could be presented by student groups via a presentation leaving the interrelations and economic consequences for a discussion moderated by the lecturer.

2.4 Student Assessment

Following the effectiveness testing of recent case studies, we assessed the pedagogical usefulness of the case with a structured survey (see Churyk and Stenka 2014; Davis and Matson 2014; Holtzblatt and Tschakert 2014). A questionnaire with 12 statements similar to the one used by Detzen, Hoffmann and Zülch (2013) as well as Detzen, Stork genannt Wersborg and Zülch (2015) was distributed to the students after the in-class discussion of the teaching case. Students were asked to indicate their level of agreement based on a five-point Likert-type scale from one (“Strongly Agree”) to five (“Strongly Disagree”). Table 3 presents the results of our survey.

[Table 1 about here]

As the table above shows, the vast majority of students expressed the opinion that case studies are highly useful (average of 1.25) for learning accounting. Furthermore, statements 2 and 3 of the survey indicate that participants’ knowledge in accounting for non-derivate financial instruments according to IFRS was materially improved by the implementation of our case, starting from a rather weak self-

assessment. Consequently, we see our first formulated learning objective (LO) of the case approved by the student-feedback.

Moreover, the learning experience seemed to be particularly enhanced via embedding related accounting and corporate finance topics in a real world restructuring context. The strong results for statements 4 to 6 approve the integrative nature of our case that is defined by LO 2 to LO 4. The holistic understanding of financial instruments relating to the accounting interlinkages, the respective application to the restructuring environment and the resulting economic consequences is, in our opinion, highly important for business students to practice because they are likely to face such complex situations along their potential career paths in the banking and consulting industry.

Overall, working on case studies in general was perceived as effective (LO 5) and the level of difficulty – taking into account the complexity of financial instruments and financial restructuring – was approved as being appropriate. This appropriateness was underpinned by students' feedback that they spent four hours on average preparing the in-class discussion.

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Appendix

Table 1: Aggregated student responses to questionnaire

Statement N = 28	Strongly Agree	Agree	Neutral	Dis-agree	Strongly Disagree	Average
	(1)	(2)	(3)	(4)	(5)	
In general, case studies are useful for learning accounting.	21	7	0	0	0	1.25
Prior to the case, my understanding of the accounting treatment of financial instruments was weak.	3	17	6	1	1	2.29
The case increased my knowledge of the accounting treatment of financial instruments.	7	18	2	1	0	1.89
The case study provided "real-world" application of what I learned in class.	11	12	4	1	0	1.82
The case required me to integrate knowledge of several accounting topics.	5	14	8	1	0	2.18
The integration of corporate finance topics helped me to understand the practical application of accounting standards on financial instruments.	9	16	2	1	0	1.82
The case study was too difficult.	1	5	10	10	2	3.25
The case was too easy.	0	1	11	12	4	3.68
Overall, the case provided a beneficial learning experience.	7	18	2	1	0	1.89
Overall, the case study served the purpose of this course well.	4	21	2	1	0	2.00
I enjoyed working on the case study.	2	19	5	2	0	2.25
The case study enhanced my problem-solving skills.	2	12	12	2	0	2.50

Source: Own creation following Detzen et al. (2013; 2015)

3 Teaching Notes

3.1 Introductory Remarks

The following solutions are intended to facilitate the use of the educational resource for a case-based and integrative accounting education. The integrative nature of the case allows instructors to use the case study to teach the interrelationship between different accounting topics and corporate finance theories. In particular the case asks students to work on the recognition, measurement and disclosure of non-derivative financial instruments embedded within a financial restructuring environment.

We give instructional guidance in *italics* where helpful. The given instructional guidance should not be required by students as solutions to the requirements. The intention of the instructional guidance is to share teaching experiences and the reasoning behind specific requirements. Therefore, the teaching notes are solely meant to equip instructors; a distribution to the students is not intended. By distributing solutions to the class, the impression might be created that the issues are less controversial which undermines the case's "real-life" approach. Please note that the solutions represent solely the personal opinion of the authors.

3.2 Presentation of Financial Instruments

1) Please provide the definition of a financial instrument according to the International Financial Reporting Standards (IFRS).

In order to lay the foundations for the discussion of the accounting for financial instruments, students are requested to define the term "financial instruments" according to IAS 32. Although the requirement only asks for the definition ac-

According to IAS 32.11, we recommend drawing students' attention to the importance of the term "contract" and to the definition in IAS 32.13. In particular, the understanding of "discretion" and "enforceable by law" is pivotal for an effective in-class discussion of "contractual obligations" in requirement 3.2.3.

Answer:

According to IAS 32.11, a financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity.

The term contract is important to the definition and refers to "an agreement between two or more parties that has clear economic consequences that the parties have little, if any, discretion to avoid, usually because the agreement is enforceable by law" (IAS 32.13).

2) What are the pre-requisites according to IAS 32.11 and IAS 32.16 to classify a financial instrument as equity? Please ignore the specific exemptions in IAS 32.16A-F for your answer.

After providing the general definition of a financial instrument in A.1, the students are now asked to describe how an equity instrument is specifically defined under IAS 32. The first definition of the requirement according to IAS 32.11 should be used to remind students of the basic function of equity as the "residual item" particularly in the wake of dismantling the respective company (e.g. after financial distress). The in-class discussions where the case was tested brought to light that students are so focused on the accounting details that they miss the economic function and therefore, the real-life importance of the classification of equity in business in general (e.g. the loss absorption function of the "residual item").

The second part of the requirement asks for the definition according to IAS 32.16 (excluding exemptions in the paragraphs 16A-F) covering the “contractual obligations” and the “settlement in the issuer’s own equity instruments”. The instructor is advised to emphasise that especially the part of the equity definition in IAS 32.16 (a) regarding the “contractual obligations” are important for the coming discussions in the teaching case, due to the utmost importance of the concept of contractual obligation in the assessment of an equity instrument under IAS 32.

The last parts in paragraph IAS 32.16 (b) deal with instruments that are settled in the entity’s own equity instruments and usually structured as options (see IAS 32.AG27). For pedagogical reasons, we focus on non-settlement structures as outlined in IAS 32.16 (a) in order to direct students’ awareness to the general points of the debt versus equity discussion within the IFRS regime. With the same rationale, we left out the specific exemptions in IAS 32.16A-16F.

Answer:

An equity instrument is any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities (IAS 32.11).

The instrument includes no contractual obligation either (IAS 32.16 (a)):

- to deliver cash or another financial asset to another entity; or
- to exchange financial assets or financial liabilities with another entity under conditions that are potentially unfavourable to the issuer.

If the instrument will or may be settled in the issuer’s own equity instruments, it is (IAS 32.16 (b)):

- a non-derivative that includes no contractual obligation for the issuer to deliver a variable number of its own equity instruments; or

- a derivative that will be settled only by the issuer exchanging a fixed amount of cash or another financial asset for a fixed number of its own equity instruments. For this purpose, rights, options or warrants to acquire a fixed number of the entity's own equity instruments for a fixed amount of any currency are equity instruments if the entity offers the rights, options or warrants pro rata to all of its existing owners of the same class of its own non-derivative equity instruments.

3) Do you agree with Peter that the participation certificate discussed in the CFO briefing classifies as equity? For your answer, interpret how the following three characteristics influence TCC's *contractual obligation* according to IAS 32.16 (a):

Due to the fact that a contractual obligation is the central characteristic for whether an instrument is classified as a financial liability or an equity instrument according to IAS 32, the following questions (3.1.3.1, 3.1.3.2 and 3.1.3.3) are drafted to foster the evaluation of various contract clauses that are usually embedded in mezzanine funding schemes like participation certificates (Ernst & Young 2015).

(1) The issuer's right to terminate the participation certificate.

According to information provided in the CFO briefing, it can be assumed that the participation certificate is redeemable only at the issuer's discretion. Consequently, the certificate contains no contractual obligation according to IAS 32.16 (a) (Ernst & Young 2015).

Answer:

Peter is correct that TCC's right to redeem the participation certificate does not lead to the classification of a financial liability according to IAS 32 because the

redemption is solely at TCC's discretion and therefore not a "contractual obligation" to deliver cash.

(2) The determination of the amount of participation.

Because the delivery of cash to participation holders is solely linked to the occurrence of dividend payments to TCC's shareholders, the clause does not constitute a contractual obligation according to IAS 32.16 (a) (Ernst & Young 2015). We recommend discussing this verdict in comparison to dividend payments on ordinary shareholders whereby shareholders can expect a dividend payment from the entity in which they own a share but still do not have the "right" to receive them. Within the IAS 32 framework this situation does not lead to the classification of common shares as financial liabilities.

Answer:

Again Peter's accounting opinion is correct because the payments are at the discretion of the issuer and the distribution of dividends to ordinary shareholders can be suppressed by TCC's management. Therefore, the "dividend blocker" clause does not constitute a contractual obligation.

(3) The maturity of the participation certificate.

The maturity of any financial instrument and the resulting legal obligation to repay the outstanding principal amount is the prime example of a contractual obligation to deliver cash according to IAS 32.16 (a). Although not specifically addressed in the case, the lecturer is encouraged to mention at this point that the combination of a perpetual instrument (e.g. perpetual debt without the legal obligation to repay the principal amount) with fixed interest payments (the interest payments are not at the management's discretion) also leads to the classification

of a financial liability according to IAS 32 because the coupon payments present contractual obligations (IAS 32.AG6).

Answer:

In this case Peter's accounting opinion is correct, because the participation certificate is perpetual and therefore presents no contractual obligation for TCC to repay the bond.

4) Consider the final terms of the participation certificate in the prospectus and explain:

The authors' experience from real-life transactions is that the contractual terms of the transaction change throughout the negotiation and this has been implemented in the case to maintain its relevance for practice. Hence, adaptations result from misunderstandings between TCC's CEO and the head of accounting. With the communication problems, we intend to highlight the importance of an integrated understanding of accounting as well as corporate finance issues. Students are required to analyse the various outcomes of the negotiation and to adjust – if necessary – the accounting treatment.

i. Why the financial auditor classifies the participation certificate as a liability.

Although the finite maturity and the financial covenant both independently lead to the contractual obligation that forces TCC to classify the participation certificate as a financial liability, we recommend discussing only the finite maturity under 3.1.4.1 at this point. The accounting impact of financial covenants is discussed in detail under 3.1.4.2. In the in-class discussion to test the case, we stressed that no matter how many criteria in the prospectus are equity-like according to IAS 32 the existence of only one criterion that creates a contractual obligation is suffi-

cient to force TCC to classify the instrument as a financial liability according to IAS 32.16.

Answer:

The contractual obligation to deliver cash in the future (e.g. repaying the bond after five years) is a criterion that leads to the liability classification according to IAS 32.16 (a).

ii. What role the included financial covenant plays for the classification according to IAS 32.25.

The accounting standard specifies in IAS 32.25 “Contingent settlement provisions” as uncertain future events that may require the entity to deliver cash or another financial asset, leading to the financial liability classification of the concerned instrument. In particular, the standard provides “the issuer’s future revenues, net income or debt-to-equity ratio” as examples for such an event. In accordance with the IASB example, the teaching case lays out that fundamental reason of the deterioration of TCC’s financial situation are the declining revenues due to a customer order cancelation. This loss in revenues eventually triggers the covenant breach.

At this point of the in-class discussion, we recommend to recap the specific terms of the financial covenant (see the definition of the interest coverage ratio in figure 3 in the appendix), briefly discuss the economic consequence of a breach (e.g. the right of the bank to ask for repayment of the loan) and the rationale behind the covenant from a bank’s perspective (see recommended solution 3.1.4.2). In order to ensure that students understand the importance of covenants from a corporate finance perspective, we provided them with a definition and common characteristics of covenants (see second part of the recommended solution 3.1.4.2) during the in-class discussion. Moreover, to understand the bank’s inten-

tion to demand a financial covenant, it is important to interpret two of the listed three criteria in IAS 32.25 that could lead to the classification as an equity instrument according to IAS 32 despite the existence of a contingent settlement provision (e.g. financial covenant).

First, IAS 32.25 (a) stipulates that if the contingency is “not genuine” then it does not lead to the financial liability classification. IAS 32.AG28 defines that “not genuine” means that events are extremely rare, highly abnormal and very unlikely to occur. Students should understand that the breach of a financial covenant is obviously not highly abnormal because the banks insist on having them due to risk management requirements and concrete experiences to incorporate these contractual clauses in the loan agreement.

Secondly, IAS 32.25 (b) mentions the liquidation of the respective entity as contingency that does not lead to the financial liability classification. According to the provided prospectus, the repayment of the loan is only connected with the covenant breach and not with the liquidation of the company. Moreover, the rationale of the financial covenant is to trigger the repayment of the loan before financial distress hinders the company’s ability to repay the financial liability.

The third criterion mentioned in IAS 32.25 (c) specifically deals with the exemptions in IAS 32.16A and IAS 32.16B in combination with IAS 32.25. Due to the pedagogically motivated scope of the teaching case (as explained in A.2), we recommend to skip the criterion in IAS 32.25 (c).

Answer:

According to IAS 32.25, the event of the occurrence or non-occurrence of uncertain future events (e.g. lack of future revenues) is beyond TCC’s control. Therefore, TCC does not have the unconditional right to avoid delivering cash (e.g. repay the loan) in case of a financial covenant breach.

Financial Covenants: “A financial covenant is an undertaking given by a borrower to its lender to maintain a minimum or maximum level of a financial measure such as gearing or net worth or interest cover” (Moir and Sudarsanam 2007). Covenants are generally defined as additional contractual agreements that come in various forms including positive (e.g. the borrower is required to invest the borrowed money in a specific asset), negative (e.g. the borrower must not invest the borrowed money in a specific asset) and financial covenants (e.g. interest coverage ratio). A breach of an agreed upon debt covenant can give the borrower the right to cancel the contract irrespective of the lenders’ ability to repay the bond or loan.

5) What is the correct accounting treatment of the debt-for-equity swap according to IFRIC 19? Please provide the booking entries for the transaction detailed in Table 2.

The requirement provides the lecturer with the opportunity to introduce the common restructuring measure “Debt-for-equity swap” (Weston, Mitchell, and Mulherin 2004), including the required accounting treatment according to the IFRS. Furthermore, the requirement gives the lecturer the chance to briefly explain the role of the International Financial Reporting Interpretations Committee (IFRIC) within the rules-based IFRS framework. The IASB explains “The objectives of the Interpretations Committee are to interpret the application of IFRS, provide timely guidance on financial reporting issues that are not specifically addressed in IFRS [...]” (IASB 2015). Because neither IAS 32 nor IFRS 9 specifically deal with the accounting treatment of the extinguishment of a financial liability due to the issue of equity instruments to the creditor, the IASB issued IFRIC 19 “Extinguishing

Financial Liabilities with Equity Instruments” in 2009. The interpretation offers guidance on how to account for transactions like debt-for-equity swaps.

The in-class discussion of the debt-for-equity swap should briefly touch upon the reasons for the difference between the nominal amount of the loan (€10 million) and the (credit risk adjusted) fair value (€8 million). Students should learn that the deteriorated credit risk situation of TCC induces the bank to accept an extinguishment of the liability lower than the original principal amount of the loan. Technically speaking, the credit risk adjusted fair value of the loan is less than the nominal value due to the bank’s revised cash-flow expectation to not receive full repayment of the outstanding loan.

TCC’s equity increase (e.g. credit equity booking) of €7.9 million is the result of subtracting the incremental transaction costs of €0.1 million from the fair value of the consideration of €0.8 million. The deduction of the transaction costs from equity is required by IAS 32.35 because the costs are directly linked and incremental to the issuing of TCC’s additional equity (Ernst & Young 2015). The booking entry assumes that the transaction costs are paid directly and therefore, the account “cash and cash equivalents” is credited by €0.1 million.

IFRIC 19.6 requires that the fair value of the equity instruments should be measured first. Only if the measurement of the fair value of the issued equity instruments is not reliably possible the fair value of the liability can be used as a valuation of the new equity. Due to the pedagogical focus of the case, the fair value of the new equity instruments is given and no valuation issues (e.g. changes in shareholdings) are raised. The provided numbers assume that the fair value of the new equity equals the fair value of the liability.

This situation is in line with the expected rational behaviour of the development bank and the existing shareholders. It can be assumed that both parties

only accept fair values in line with IFRS 13 because the measurement of the capital injection and the extinguishment of the liability is a value that would be seen in an “orderly transaction between market participants” (IFRS 13.9).

Answer:

A debt-for-equity swap is a common restructuring measure to improve the financial position of a company. Debt is exchanged for a predetermined amount of equity. The difference between the carrying amount of the financial liability extinguished, and the fair value of the consideration (e.g. the capital injection), shall be recognised in profit or loss (IFRIC 19). Incremental costs attributable to an equity transaction are debited directly to equity (IAS 32.35).

[Table 1 about here]

Debit “Other financial liabilities”	€10 000
Credit “Share Capital”	€7 900
Credit “Other income”	€2 000
Credit “Cash and cash equivalents”	€100

3.3 Measurement of Financial Instruments

1) Is Peter right that the fluctuating market values of the bond have to be reflected in the income statement? What alternative accounting treatment would be possible?

According to IFRS 9.4.2.1 financial liabilities are measured at amortised cost or at fair value through profit or loss (FVTPL). The FVTPL categorization is only allowed for instruments that are held for trading, for instruments with embedded derivatives, stand-alone derivatives or to avoid an accounting mismatch.

- *According to IFRS 9 Appendix A, a financial liability has to be classified as “held for trading” if the instrument is held for the purpose of selling or repurchasing, is managed within a portfolio to generate short-term profit or is a derivative according to IFRS 9. Based on the information provided in the case, all of these three held for trading criteria can be rejected.*
- *Secondly, the FVTPL category has to be used for instruments with embedded derivatives. In accordance with IFRS 9.4.3 an embedded derivative is a component of a hybrid contract that generates cash-flows like a stand-alone derivative. The information provided in the case does not lead to the conclusion that the contractual clauses of the participation certificate are embedded derivatives.*
- *Thirdly, as a matter of fact, the issued bond itself is not a derivative according to IFRS 9 Appendix A.*
- *Lastly, in accordance with IFRS 9.4.2.2, the FVTPL category can be used to avoid an accounting mismatch (between financial liabilities that are linked to specific financial assets (Ernst & Young 2015)), or if the key management personnel evaluates the performance of the financial liability on a fair value basis. According to the provided information this is not the case for TCCs treasury management.*

Therefore, the measurement at amortised cost is the correct way according to IFRS 9.4.2.1 and the fair value accounting would be non-compliant with the IFRS rules.

Answer:

According to IFRS 9, financial liabilities are measured at amortised cost calculated under the effective interest method except for liabilities measured at “Fair Val-

ue Through Profit or Loss (FVTPL)”. The FVTPL category includes: Held for trading, Derivatives or “Fair Value Options (incl. instruments with embedded derivatives)”.

Peter’s statement is incorrect, because the bond does not fit into the FVTPL category. Therefore, the financial liability from the issuance of the bond has to be measured at amortised cost. In conclusion, TCC’s income statement should report the corresponding interest income from the application of the effective interest method and no gains or losses due to fluctuating fair values of the traded bond.

- 2) Due to the zero bond structure of the bond, TCC has to apply the effective interest method according to IFRS 9.B5.4.1-B5.4.7. Please complete the table below assuming that no dividends will be paid by TCC for the duration of the bond.**

According to IFRS 9 Appendix A, the amortisation using the effective interest method for the zero bond has to be reflected in TCC’s IFRS financial statements. The effective interest method recognizes and allocates the interest expenses over the life of the financial liability. The allocation of the interest expenses is done by discounting the difference between the initial amount and nominal amount with the effective interest rate. The calculation of the effective interest rate has to include the relevant transaction costs (IFRS 9 Appendix A). The transaction costs have to be deducted from the financial liability at inception and to be accrued via the effective interest method with an effective interest rate of about 7.26 percent:

- 1. Step – Calculation of the initial amount*

Issue amount of €25 million

./. Transaction costs of €0.350 million

= Initial amount of €24.65 million

- 2. Step – Calculation of the effective interest rate*

The general equation based on the compounded interest method:

$$\begin{aligned} &\text{Nominal Value} \\ &= \text{Initial Amount} \\ &\times (1 + \text{Effective Interest Rate})^{\text{Number of Years}} \end{aligned}$$

Transformed equation to calculate the effective interest rate:

$$\text{Effective Interest Rate} = \sqrt[\text{Number of Years}]{\left(\frac{\text{Nominal Value}}{\text{Initial Amount}}\right)} - 1$$

Using the given data in the teaching case:

$$\text{Effective Interest Rate} = \sqrt[5]{\left(\frac{35\,000\,000}{24\,650\,000}\right)} - 1$$

$$\Rightarrow \text{Effective Interest Rate} \sim 7.26 \%$$

The requirement explicitly specifies that no dividend distribution by TCC should be assumed and therefore no participation of the profit has to be reflected in the calculation of the effective interest rate and the resulting discount. If TCC had distributed dividends, the holders of the participation right would have received an additional payment.

Answer:

[Table 1 about here]

- 3) Calculate the interest coverage ratio for the years 2014 and 2015 as defined in the prospectus in figure 3 of the appendix. Include the EBITDA forecasts of figure 2 in your calculations.**

As given in figure 3 of the case appendix, the interest coverage ratio is defined as (1) earnings before interests, taxation, depreciation and amortization (EBITDA) over (2) net interest expenses of the consolidated financial statements. The interest expenses have to include the interest expenses for the issued bond as calculat-

ed under 3.2.2 and the interest expenses for the loan from the business development bank (€10 million and an annual interest rate of seven percent).

$$\text{Interest coverage ratio} = \frac{\text{EBITDA}}{\text{Loan interest} + \text{Bond interest}}$$

Answer:

[Table 3 about here]

In both fiscal years, the interest coverage ratio is met, because the ratio is higher than the 350 percent required by the business development bank.

- 4) How does the sales collapse impact the interest coverage ratio? Please use the revised income statement from Table 1 for your calculations.**

Answer:

[Table 4 about here]

The interest coverage ratio is breached, because the ratio is lower than the 350 percent required by the business development bank.

3.4 Disclosure of Financial Instruments

Because disclosure requirements in general are not at the centre of (un-)graduate accounting curriculums (Ruhl and Smith 2013), we consider it useful to give students the following brief overview regarding the scope of the accounting standard IFRS 7 “Disclosure of Financial Instruments”.

According to IFRS 7.1, the aim of the standard is to provide users of financial statements with disclosures that enable them to evaluate:

- *The significance of financial instruments for the entity's financial position and performance; and*
- *The nature and extent of risks arising from financial instruments, to which the entity is exposed during the period and as of the reporting date, and how the entity manages those risks.*

The IFRS 7 applies to all entities, including corporates like TCC that have few financial instruments and those that have many financial instruments like banks or insurance companies. During the in-class discussion, we provided students with the following hypothetical user questions that IFRS 7 disclosures target:

- *What IFRS 9 measurement categorizations are used by the entity?*
- *Are there any financial assets and liabilities that are offset against each other?*
- *Does the company pledge financial assets as collateral?*
- *What are the fair values of the at amortized costs categorized instruments?*
- *Were there any covenant breaches in the respective reporting period?*
- *What are the gains and losses of the IFRS 9 categories?*
- *What credit risk, liquidity risk or market risk exposure faces the entity due to the financial instruments?*

3) Why is Thomas pressuring to close the debt-for-equity swap before the end of the fiscal year? What disclosures would otherwise be needed according to IFRS 7.19?

The board of the IASB concluded that disclosures of defaults and breaches of loan payables (e.g. bank loans, bonds) are relevant information for users about the

entity's creditworthiness and its prospects of obtaining future loans (IFRS 7.BC32). This particular reasoning is exactly the kind of information that TCC tries to hide by executing the debt-for-equity swap and therefore, avoiding the potential negative capital market effects of such a disclosure.

Although the teaching case and the requirements do not deal with IAS 1 "Presentation of Financial Statements", we encourage lecturers to briefly explain that, according to IAS 1.60, prepares of IFRS statements are required to disclose whether a liability is current, i.e. a maturity within the next twelve months after the reporting date, or non-current, i.e. a maturity beyond the next twelve months after the reporting date. Due to the covenants breach and the imminent loan repayment, TCC would have been required to reclassify the loan as a current liability indicating that a repayment of the loan would be required within the next twelve months.

Answer:

Thomas is aware of the IFRS 7.19 requirement to disclose the carrying amount of loans when breaches of the loan agreement terms occurred during the reporting period (unless the breaches were remedied on or before the reporting period). The debt-for-equity swap leads to the extinguishment of the respective financial liability (the bank loan) and consequently, the IFRS 7 disclosure is not necessary, because the standard only requires this disclosure for financial liabilities that are on the balance sheet at the reporting date.

An example of such a disclosure would be: "As of 31 December 2014, TCC was in breach of its borrowing covenants with respect to a banking loan with a carrying amount of €10 million. As a result, the amount was reclassified as a current liability reflecting the right of the lender to call these funds immediately".

4) What year-end fair value disclosure would be necessary for the loan according to IFRS 7.25?

The requirement introduces to the students the concept of IFRS 7 to disclose fair values according to IFRS 13 “Fair Value Measurement”, despite the fact that the respective financial instruments are measured on the balance sheet at amortized costs. The IASB argues in IFRS 7.BC36 that fair values are “[...] relevant to many decisions made by users of financial statements because, in many circumstances, it reflects the judgement of the financial markets about the present value of expected future cash flows relating to an instrument. [...]”. Therefore, IFRS 7.25 requires disclosing fair values for financial assets or liabilities not measured on a fair value basis according to IFRS 9 “Financial Instruments”. Students should be reminded that the financial statement category “other financial liabilities” is measured at amortized costs and are therefore, reported with their carrying amount.

During the in-class discussion, we drew students’ attention to the significant difference of €2 million between the carrying and fair value amount of the loan that TCC would be required to disclose. As already discussed under A.5, due to the deteriorated business outlook for TCC, it can be assumed that the difference is mainly caused by the increased credit risk that the loan represents for the development bank. The decreased likelihood of full repayment of the loan is reflected in the calculation of the fair value. Through this kind of financial disclosure, TCC would be forced to report the judgment of the capital providers about its overall financial situation.

The lecturer should stress that fair values need not be given for instruments for which the carrying amount reasonably approximates their fair values, for example short-term trade receivables and payables (IFRS 7.29(a)). If the fair values

for financial instruments cannot be reliably measured according to IFRS 13, the entity has to provide information that assists users in making their own judgments about possible differences between the carrying and fair value amount (IFRS 7.30; Ernst & Young 2015).

Answer:

IFRS 7.25 explicitly requires reporting the fair value of each class of financial liability in a way that permits comparison with the corresponding carrying amounts. One possible way for TCC to meet the requirements would be the following table:

[Table 5 about here]

3.5 Related Corporate Finance Issues

In order to improve the learning outcome of the teaching case, we drafted accompanying corporate finance related requirements. The corporate finance issues ask the students to reflect upon the classification of the financial instrument. Although the main learning objectives of the teaching case are centred on accounting issues, the in-class discussion showed that the understanding of the accounting-related learning objectives was significantly improved by placing the accounting technicalities in a corporate finance context.³⁰

Despite the fact that the corporate finance related questions are presented as the last ones, the lecturer might consider it useful to start the in-class discussion of the teaching-case with the related corporate finance issues precisely to illustrate the students the economic consequences of equity-vs-debt decisions.

Derived from a neoclassical inspired theory it can be argued that the mix of the

³⁰ Please see section “Student Assessment” in the implementation guidance for further details.

entity's capital structure does not matter in perfect capital markets and the question of whether to issue equity or debt is not worthwhile being considered.

However, as the practical realities reveal, the classification of financial instruments as equity or debt does matter and therefore, the accounting treatment of an issued security has an impact on the market value of the entity (Myres 2001). In order to ensure that students grasp the importance of the equity-vs-debt discussion, we introduced the basic concepts of the Modigliani / Miller theory, the trade-off theory and the signalling effects of corporate finance measures. Based on our experience, advanced undergraduate students and graduate students should be familiar with the presented corporate finance issues due to specific corporate finance courses in the curriculum. Therefore, the solutions and the requirements are solely targeted to refresh students' understanding of capital structure questions and the economic consequences of corporate finance measures. If the lecturer wants to present more details we refer to standard corporate finance textbooks.³¹

1) What is the optimal leverage ratio for TCC according to the Modigliani and Miller proposition I?

Answer:

According to the Modigliani and Miller proposition I, the market value of a company is not affected by its capital structure (Modigliani and Miller 1958). Within the framework, it is argued that the value of the company is entirely derived from the cash-flows that are generated by the total assets of the company (“the *left hand* side of the balance sheet”). Decisions regarding the funding structure (“the *right hand* side of the balance sheet”) do not have any impact on the firm value.

³¹ See for example Brealey, Myers, and Allen (2007) as a comprehensive teaching book to discuss these capital structure issues in more detail.

Therefore, assuming that the equity from TCC's shareholders is limited, TCC's optimal capital position would be funded with a maximum of debt because TCC's existing shareholders would have no incentive at all to finance TCC's strategy with (additional) equity. Conversely, it would be not in the (rational) interest of the existing shareholders to dilute the decision making power of the current shareholders with new shareholders.

But: The irrelevance theorem of the capital structure is based on the assumption of the efficient market.

2) Please challenge your conclusion from D.1 with the trade-off theory.

Answer:

The irrelevance theory of the capital structure (Modigliani Miller proposition I) excludes the benefits of the "debt tax shield" and ignores "financial distress costs". However, both of these aspects have to be considered by TCC's management in finding the optimal capital structure. Therefore the optimal funding structure, i.e. the structure with the maximum firm market value, is determined by the costs and benefits of debt. Figure 1 illustrates this point with the maximum of the red line (the value of the levered firm). The maximum point of the value of the levered firm indicates the pivot point of the benefits of leverage because at this point the marginal financial distress costs are higher than the marginal tax shield benefits for additional leverage.

[Figure 1 about here]

According to the trade-off theory of capital structure, a company balances the value of the tax benefit from deductibility of interest with the present value of the costs of financial distress.

The “debt tax shield” is the additional value of the firm that stems from the deduction of interest expenses (e. g. from issued debt) from the taxable income of the company. *Ceteris paribus*, the higher the interest expenses for a given profit, the lower the taxes the company has to pay. Because tax payments can be interpreted as costs that lower the firm value, the higher leverage (with a lower tax take) has a positive impact on the firm value (see Graham 2000).

But, increasing the leverage of a corporation raises the bankruptcy costs in the event of financial distress. Direct bankruptcy costs like legal or administration fees occur when the company defaults and creditors have to go to court to get a least part of the borrowed money back. In addition, there are indirect bankruptcy costs like avoiding a bankruptcy filing (see Ross, Westerfield, Jaffe, and Bradford 2007). A typical example of indirect cost is a supplier who abandons a customer due to the prospect of losing a financial claim during bankruptcy procedures.

3) What kind of signals can equity issuances convey to the capital market?

Please discuss your answer within the pecking order theory.

Answer:

The pecking order theory introduces asymmetric information to the question of the optimal capital structure. In contrast to the firm’s management, the capital market has limited knowledge about the financial prospect of the firm. The theory states that rational management uses internal financing when available and chooses debt over equity when external financing is required. This prioritization of funding sources is the “pecking order” and reflects the firm’s management funding decision in connection with the expected risk and reward profile of investment projects (Myers 1984).

Based on the pecking order theory, firms that announce equity issuances have therefore no internal funding available and no access to debt or believe that

the share price is too high. Obviously, all characteristics can be interpreted as signals to the capital market that the financial outlook of the company requires further assessment.

4) Which corporate finance measure does TCC use to resolve the capital structure issue? Which of the above capital structure theories best explains TCC financial restructuring decision?

Answer:

TCC renegotiates the terms of the outstanding loan from the development bank and issues its own equity instruments to the bank to fully repay the loan. The debt-for-equity swap is a common measure to improve the capital structure within financial restructuring (Weston et al. 2004).

TCC's finance function weighs up the costs (e.g. the negative capital market reactions due to the covenant breach) and benefits of the outstanding loan (e.g. the potential tax benefits of the loan) and comes to the conclusion that the issuance of additional shares to repay the loan is the best way to solve TCC's capital structure issue under the specific circumstances. Due to the specific consideration of financial distress costs (e.g. the potential covenant breach as a first step towards a financial distress situation) the trade-off theory best explains TCC's corporate finance measures.

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Appendix

Table 1. Booking entries for the debt-for-equity swap

in 000 €	As of July 2014	Accounting Treatment
Book Value Loan	10 000	Carrying Amount (IFRIC 19.9)
Fair Value Loan	8 000	Fair Value of the Consideration (IFRIC 19.9)
Advisory Fees	100	Incremental Transac- tion Costs (IAS 32.35)

Table 2. Effective interest method calculation

Fiscal Year	Opening Balance in €	Interest Expenses in €	Closing Balance in €
	<i>(Initial Amount)</i>	<i>(Opening Balance * Effective Interest Rate)</i>	<i>(Opening balance + Interest Expenses)</i>
2014	24 650 000.00	1 790 346.83	26 440 346.83
2015	26 440 346.83	1 920 380.98	28 360 727.82
2016	28 360 727.82	2 059 859.60	30 420 587.42
2017	30 420 587.42	2 209 468.66	32 630 056.08
2018	32 630 056.08	2 369 943.92	<i>(Nominal Amount)</i> 35 000 000.00

Table 3. Interest coverage ratio calculation I

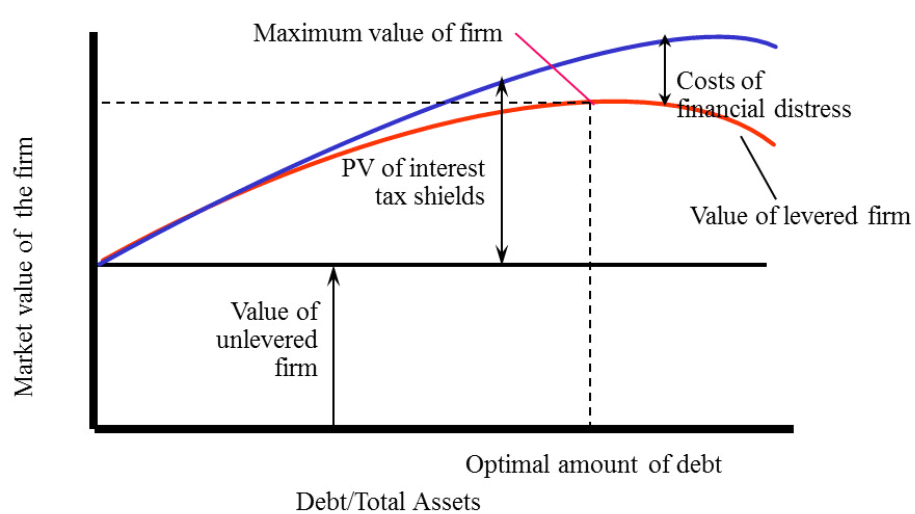
in €	2014e	2015e
EBITDA	10 058 000.00	11 678 000.00
Loan Interest	700 000.00	700 000.00
Bond Interest	1 790 346.83	1 920 380.98
Interest Coverage Ratio	403.88%	445.66%

Table 4. Interest coverage ratio calculation II

in €	2014e
EBITDA	7 328 000.00
Loan Interest	700 000.00
Bond Interest	1 790 346.83
Interest Coverage Ratio	294.25%

Table 5. IFRS 7 Fair value disclosure

IFRS 9 Financial Liability Classification	Carrying Amount	Fair Value Amount
“Other Financial Liabilities”	€10 million	€8 million

Figure 1. Impact of leverage on the market value of the firm


Source: Brealey et al. (2007)

IV.

DETERMINANTS OF CONSISTENT CAPITAL MARKET
COMMUNICATION: EVIDENCE FROM GERMANY

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DETERMINANTS OF CONSISTENT CAPITAL MARKET COMMUNICATION: EVIDENCE FROM GERMANY

Abstract

This paper investigates the level of consistency in using financial key performance indicators (KPIs) in capital market communication in Germany and examines specific determinants of consistent KPI reporting. To measure such consistency, the study reports three consistency indices that were uniquely developed for this paper. The indices measure the consistent KPI reporting of a sample of German listed companies from 2009 to 2014 and consist of up to 396 firm year observations. These indices indicate a high level of inconsistency in the reporting behaviour of German companies in the management report, the annual report and capital market communication. The results range from 36% to 48% consistency, indicating room for improvement. The results of a random effects regression analysis report for all indices that the level of consistency increased significantly in 2013 and 2014. The study shows that profitable firms and firms with an above average number of KPIs report more consistently than other firms. This paper contributes to the literature on disclosure topics in accounting by introducing KPI consistency indices as a proxy of disclosure quality and demonstrates that the KPI reporting behaviour of German firms lacks consistency.

Keywords: Disclosure; Consistency; Key performance indicators; Germany

1 Introduction

The development and determinants of financial disclosure are the gist of numerous discussions between and within academia, standard setting bodies and practitioners. A core topic of the ongoing discussion is the need for an internationally harmonised management report as a crucial component of capital market communication (IASB, 2005) to ease the classical principal-agent problem (Jensen & Meckling, 1976). On national level in Germany, management reports have a long tradition as the narrative part of financial reporting in which management gives an overview of a firm's current and expected financial performance. A management report acts as a reference book for all capital market communication, because it gives investors information about the firm's structure, its business strategy and internal performance indicators. The importance of management reports as part of capital market communication is underpinned by empirical studies that provide evidence on the decision usefulness of a firm's strategy section and management's forward-looking statements (e.g. Sieber et al., 2014; Oberdoerster, 2009). Unlike consolidated financial statements, the preparation of management reports is not globally harmonised. Responding to the divergence in respect of the quality and quantity of management reports, the IASB in London published its "Practice statement: Management commentary" (PS) in 2010 (IASB, 2010). The PS sets out non-binding guidelines for the presentation of decision useful information in management reports. In particular, the PS requires that the presented information has to be consistent with, complement and supplement financial information. Key performance indicators (KPIs) as "factors by reference to which the development, performance or position of the business of the company can be measured effectively" (UK Companies Act, 2006) should form the basis of the discussion in the PS and have attracted even earlier than that attention from regulation bodies. For

example, in 2004 the European Commission published a directive for European companies to disclose additional and more detailed information on KPIs that management uses to steer companies. The additional information on KPIs should allow the users of financial information to better understand the performance and development of the company. In 2012, a new German Accounting Standard (GAS) was published to specify amongst other things KPI disclosures. In 2015, the German Financial Reporting Enforcement Panel (FREP)¹ put the consistent use of KPIs on its audit agenda (FREP, 2014). Although KPIs feature in most financial disclosures, attract increased attention from regulators and their usefulness is not disputed, there is limited research on the quality of KPI reporting (Elzahar et al., 2015).

To contribute to the research on financial disclosure in general and the further development of harmonised financial KPI reporting guidelines, we investigate the consistent use of financial KPIs in management reports as well as in consolidated financial statements and in investor relations presentations for year-end earning calls. We calculate three uniquely constructed disclosure indices to analyse the consistent use of financial KPIs in capital market communication of German companies spanning the period from 2009 to 2014. We broadly define capital market communication as financial disclosures covering the management report, the consolidated financial statements and the investor relations presentations for year-end earning calls.

¹ FREP has been examining financial reporting of companies listed in the regulated market in Germany since July 2005. Enforcement of financial reporting is performed in Germany in two stages; the first stage involves the government-appointed privately organised institution FREP, with the Enforcement Panel as its active body, while the second stage is performed by the Federal Financial Supervisory Authority (“Bundesanstalt für Finanzdienstleistungsaufsicht” – BaFin), which has sovereign authority (http://www.frep.info/index_en.php).

We identify a low level of consistency (36% to 48%, depending on time period and index). There is a low level of consistency in all three elements of capital market communication. The inconsistency cannot be solely explained by different KPI definitions in the different elements of capital market communication. We are able to show that the level of consistency improved from 2009 to 2014. Our regression results indicate that since the application of an improved GAS on management reporting in 2013, the level of KPI disclosure consistency has increased significantly. We also find evidence that companies with a high number of financial KPIs and therefore a high level of reporting complexity achieve higher consistency than companies with fewer than the average number of financial KPIs. In line with other empirical studies, we find support for the hypothesis that profitable companies on average report higher quality information (e.g. Akhtaruddin, 2005; Hossain & Mitra, 2004; Karim, 1996).

Our results show that accounting regulation is capable of improving reporting consistency through better accounting guidelines and standards. In addition, we show that firms of any size or reporting complexity are able to disclose consistent capital market information.

The remainder of the paper is organised as follows: Section 2 introduces the regulatory framework of KPI reporting in Germany. Section 3 discusses the relevant literature and the development of the hypotheses. The research design with the underlying panel data, the construction of the consistency indices and the regression model are introduced in section 4. Section 5 presents the regression results and the analysis. The paper concludes with a discussion and possible future research avenues.

2 Regulatory Framework for KPI Disclosure

According to German Commercial Code (HGB), capital market orientated firms in Germany have to disclose their management report to complement the consolidated financial statements in the annual report. The management report is part of the financial audit and further examined by FREP. Although the management report as an integral part of the annual report has a long tradition in Germany², the legal requirement for capital market orientated companies to prepare and disclose the management report only came into effect through the EWG directives 78/660 and 83/349 in 1985. As a result, the German legislator implemented HGB paragraph 315 that requires firms to provide users with information on the course of their business, the financial position and the expected development. The paragraph 315 requests that the discussion in the management report should be based on the main financial KPIs that are used in the internal management system.

Due to the increasing importance of KPIs in capital market communication, the EG directive 2003/51 in 2004 introduced the requirement to disclose the financial KPIs of internal management systems for European firms. In the same year, the Accounting Standards Committee of Germany (ASCG) issued the GAS 15 “Group Management Report”. GAS 15 formulated specific recommendations regarding the information a management report should include according to HGB paragraph 315. Among other aspects, GAS 15 clarified that the management has to disclose the financial KPIs of the internal management system and that the management report should follow the business segment structure according to the consolidated financial statements.

² Bayer AG complemented the financial statements for 1883/84 with a management report that discussed, among other aspects, fluctuating commodity prices and the acquisition of patents (Fink et al., 2013).

In 2012, the ASCG issued the GAS 20 “Group Management Report”, which must have been applied for the first time in 2013 and superseded GAS 15. GAS 20 intended to combine in a user-friendly manner the accounting standards governing group management reporting that have evolved over time (GAS 5 Risk Reporting, GAS 5–10 Risk Reporting by Financial Institutions and Financial Service Institutions and GAS 5–20 Risk Reporting by Insurance Entities, as well as GAS 15 Management Reporting) into a single accounting standard (Kajüter et al. 2010). In addition the existing guidance was streamlined and GAS 20 gives more detailed guidance on how firms have to use financial KPIs for the business review section (GAS 20.101) as well as the provided outlook (GAS 20.126). All these additional guidelines can be interpreted as clarifications and not as basic changes to the KPI reporting requirements. GAS 20 also introduced a vague definition of a key performance indicator: “A measure that is used to assess an aspect of an entity’s performance. It can be qualitative or quantitative.”

According to EU Regulation 1606/2002, German capital market orientated firms have to prepare their consolidated financial statements according to IFRS. In particular, firms have to disclose business segments with additional disclosures as part of the consolidated financial statements. Business segment reporting is regulated by IFRS 8 “Operating segments” and aims to enable users of financial statements to evaluate the nature and financial effects of the firm (IFRS 8.20). In particular, IFRS 8.23 requires firms to disclose measures the management uses to assess the segment performance and to allocate resources. If firms use more than one measure, they may limit the disclosure to the performance measure that is most consistent with the entity’s financial statements (IFRS 8.26). Apparently, the performance measure definition according to IFRS 8 and the KPI definition ac-

According to GAS 20 are not identical. But because both definitions are based on the performance measures or indicators used to manage the entity (management approach), the KPIs according to IFRS 8 and GAS 20 should be identical.

In addition to the mandatory parts of financial reporting, such as management reports and consolidated financial reports, firms are increasingly using voluntary disclosures to cater for the specific needs of the capital market. In particular, firms regularly use extensive presentations about the financial performance in year-end earning calls. In these calls, the management discusses the most recent business performance (e.g. year-end financial results according to the annual report) with financial analysts (Bragg, 2014). These investor relations presentations are voluntary and the content of the presented slides is not regulated. Nevertheless, it can be assumed that the management bases its performance discussion on the KPIs that are also used in the internal management system.

To summarise, consistent capital market communication that covers mandatory as well as voluntary elements should be based on identical financial KPIs, because all disclosure elements refer directly or indirectly to the KPIs management uses for internal control purposes.

3 Literature Review and Hypotheses Development

Several empirical studies have investigated the determinants of disclosure quality (e.g. Cooke, 1989; Ahmed & Courtis, 1999; Haniffa & Cooke, 2002). In one way or another, all these studies analyse the influence of specific factors on the disclosure quality of firms. The studies use different disclosure indices. Disclosure quality is usually measured by weighted or unweighted scores for voluntary or mandatory disclosure items in annual reports. Due to the importance of financial disclo-

sure to bridge information asymmetry as part of the principal agent problem (Jensen & Meckling, 1976), disclosure determinant analysis has been identified as an important accounting research area (Ahmed & Courtis, 1999).

Prior studies have identified explanatory factors such as size, complexity, profitability, ownership structure and financial leverage for disclosure behaviour. Despite the importance of financial KPIs for capital market communication (covering the mandatory annual report and voluntary investor relations activities), the determinants of KPI disclosure quality have received limited attention from researchers. Elzahar et al. (2015) investigates KPI disclosure quality in annual reports for a sample of UK listed companies for the period 2006 to 2010. To our knowledge, there are no studies that measure the consistent use of financial KPIs in capital market communication and that investigate the firm characteristics of consistent KPI reporting.

3.1 Size

In several prior studies, firm size was identified as a significant explanatory factor for the level of disclosure quality (Cooke, 1989; Hossain & Mitra, 2004; Lang & Lundholm, 1993; Owusu-Ansah, 1998). Larger firms can spend more resources on disclosure than smaller ones. Previous studies also found that large companies tend to disclose more information in order to increase investor confidence and to decrease agency cost, which is higher than for smaller firms (Jensen & Meckling, 1976; Watts & Zimmermann, 1990; Marston & Polei, 2004). Consistent with prior research (Cooke, 1989, 1992; Wallace et al., 1994; Apostolos, 2000) we presume that there is a significant link between firm size and consistency of capital market communication. According to Cooke (1992), there “is no overwhelming theoretical reason to prefer one size variable to another”. In prior studies, firm size was

measured by various indicators, such as sales (Firth, 1979; Cooke, 1989), total assets (Hossain & Mitra, 2004), capital employed (Akhtaruddin, 2005) or market value (Karim, 1996). We follow Hossain and Mitra (2004) to use total assets as proxy, due to the significant results of the relevant study.

H1: Consistency of disclosure information is positively associated with the size of a company.

3.2 Complexity of Firm and of Financial Reporting

We focus on two dimensions of complexity for companies to disclose financial information: the complexity of the firm and the complexity of financial reporting. Firstly, we assume that companies with an above average number of business segments tend to report financial KPIs less consistently, due to the high amount of segment information and the complexity the number of segments cause for capital market communication. This complexity stems from the increased likelihood that the business segments have conflicting operational procedures or reporting approaches (e.g. Bushman, et al. 2004). Although Cooke (1989) argues that firms with a high level of complexity are required to disclose more information to meet the information demand of capital market actors, we assume that higher complexity makes it more difficult to report consistently. We proxy firm complexity with the ratio of the number of business segments of the relevant firm to the average number of business segments of the analysed data panel.

Secondly, the argument underlying our complexity of firm hypothesis is also the basis of our argument to assume that the more KPIs a company uses in its financial reporting, the more difficult it becomes to report consistently on these indica-

tors throughout capital market communication. The number of KPIs to the average number of KPIs in the relevant panel is tested as an independent variable.

H2: Companies with higher business complexity disclose KPI information more inconsistently.

H3: Companies with above average KPIs in their financial reporting disclose KPIs less consistently in this financial reporting.

3.3 Profitability

Prior research has examined profitability as a significant indicator of disclosure quality (Akhtaruddin, 2005; Hossain & Mitra, 2004; Karim 1996, Owusu-Ansah, 1998, Wallace & Nasar, 1995, Wallace et.al., 1994). Wallace et al. (1994), Owusu-Ansah (1998) and Hossain and Mitra (2004) find that more profitable firms disclose more information in their corporate reports than less profitable companies. It is argued that especially profitable companies tend to demonstrate their good performance and the value of their investment to their investors (Soliman, 2013) in order to justify management salaries (Owusu-Ansah, 1998). Principals as managers are also interested in creating a positive impact on the entity valuation to avoid a hostile takeover. The ratio of net income to total equity is employed as an independent variable.

H4: The better the firm's profitability, the more consistent the corporate disclosure.

3.4 Ownership Structure

The ownership structure of a company tends to be an important variable for the behaviour of corporate disclosure and therefore for the consistency of disclosed

information. The relationship between insiders (e.g. managers or block owners) on the one side and external stakeholders (e.g. small investors, analysts and the public) on the other side is characterised by the agency problem, which assumes a persistent information gap between these two groups. Corporate insiders have multiple channels to obtain value-relevant information and can assess corporate items with non-public information (Bassen et al., 2010; Jensen & Meckling, 1976). Companies with investors who own a large stake of the company's share capital usually face smaller agency problems (Archambault & Archambault, 2003). Companies with a relatively high free float of shares tend to disclose more information in order to inform all owners comprehensively as part of good corporate governance and to ease the agency cost (Leftwich et al., 1981; McKinnon & Dalimunthe, 1993; Haniffa & Cooke, 2002). Consequently, we use the percentage of the free float of shares as a proxy for the ownership structure.

H5: Companies with a diffused ownership structure disclose information more consistently.

3.5 Financial Leverage

Previous studies present conflicting results about the impact of financial leverage on disclosure quality. Wallace et al. (1994) and Chow & Wong-Boren (1987) find that financial leverage has no effect on disclosure, whereas Zarzeski (1996), Archambault & Archambault (2003) and Meek et al. (1995) figure out that disclosure quality decreases with high leverage. These conflicting empirical findings are interesting, because derived from the agency theory (Jensen & Meckling, 1976) companies with a high proportion of external funding are more inclined to bridge the information asymmetry with high quality and consistent capital market disclosure. In order to investigate the role of financial leverage on consistent financial

KPI reporting, we employ the ratio of total debt to total equity as an independent variable.

H5: Companies with a high financial leverage report financial KPIs more consistently.

3.6 Stock Market Index

Companies that are listed on the German DAX30 or MDAX have to meet numerous listing regulations and disclosure requirements. That is why index listed companies are more likely to have a higher level of disclosure quality (Cooke, 1989; Wallace et al., 1994; Choi, 1973). Following Cooke (1989), companies on major indices are better covered by equity analysts than other companies. As a result, they are asked to disclose more useful decision-making information and pay more attention to disclosure quality. Derived from these theoretical and empirical results, we construct the hypothesis that a higher listing status of a company is linked to more consistent disclosure of information.

H7: DAX30 listed companies disclose more consistent information than companies that are listed on the MDAX and are not index listed, respectively.

3.7 Industry

Previous research hypothesises that the disclosure level varies between different industries (Akhtarrudin, 2005), due to different regulation policies, the nature of the work, politically sensitive requirements, such as oil and gas, complexity or specific industrial characteristics (Owusu-Ansah, 1998; Cooke, 1992). Cooke (1989) finds that manufacturing companies disclose more information than companies in other industries and assumes that distinct characteristics of industries

might result in different levels of disclosure in corporate annual reports. Haniffa & Cooke (2002) find a similar result for construction companies and firms in the trading industry. However, Owusu-Ansah (1998) finds no evidence for disclosure influence by industries. Due to these inconclusive empirical findings and the lack of a compelling theory regarding industry-specific disclosure behaviour, we do not expect a significant relationship between industry membership and the level of consistency in capital market communication.

H8: There is no significant relationship between industry type and consistency of KPI reporting.

3.8 Reporting Period

A number of previous studies have empirically supported the argument that disclosure quality improves over time, because preparers, users, auditors and enforcers gain experience in the application of new accounting standards and guidelines (Nelson, 2003; Callao & Jarne, 2010; Salewski et al., 2014). Due to European directives and improved application guidelines of KPI reporting in the recent past, we expect a similar improvement for KPI reporting quality in terms of consistency. In particular, we hypothesise that the application of the GAS 20 “Group Management Report” as of 2013 led to a significant improvement. This argument is supported by FREP putting the consistency requirement for KPIs on its audit agenda for financial statements in 2014.

H8: KPI reporting consistency has improved significantly since 2013.

4 Research design

4.1 Panel Data Sample

The study covers the composition of the German stock market indices DAX30 and MDAX in December 2014. The 80 companies listed in the two indices represent the biggest stock market listed companies in Germany. The data panel includes the fiscal years from 2009 to 2014. We start our investigation with the fiscal year 2009 in order to avoid the influence of a regulatory change caused by the underlying segmenting reporting of the analysed companies, because the application of IFRS 8 “Operating segments” was obligatory with the fiscal year 2009.

Following other studies (e.g. Akhtaruddin, 2005; Inchausti, 1997), we exclude banks and insurance companies due to industry-specific balance sheet characteristics. We also exclude companies that are not based in Germany, because they are not required to prepare and disclose management reports according to HGB. Due to the lack of investor relations presentations for a few firms, we must have two data panels. Because of better data availability for disclosed annual reports (AR), the AR panel comprises 66 firms in comparison to the capital market communication (CMC) data sample, with 33 firms. Table 1 provides more details.

[Table 1 about here]

The different composition of firms leads to a varied industry distribution in the samples (e.g. manufacturing firms in AR sample 60,61% vs. CMC sample 66,67%) and to a noteworthy difference in terms of stock market index membership: DAX30 members represent 39,39% of the AR sample and 51,52% of the CMC sample.

[Table 2 about here]

4.2 Construction of the Disclosure Indices

Although several disclosure indices are used as a proxy to measure disclosure quality and quantity (e.g. Archambault & Archambault, 2003; Cooke, 1989; Mars-ton, 1991), we are not aware of an index that assesses the consistent use of finan-cial KPIs in corporate financial disclosures. We therefore developed three unique item-based disclosure indices to analyse the consistency of capital market com-munication: Consistency index for management report (CI_{MR}); Consistency index for annual report (CI_{AR}); Consistency index for capital market communication (CI_{CMC}). The indices of this study are built on each other: the CI_{MR} covers the management report according to HGB and the CI_{AR} measures the consistency of the annual report, including the CI_{MR} and the KPI reporting of the segment report-ing according to IFRS 8 of the consolidated financial statements. The CI_{CMC} co-vers the annual report, including the management report and segment reporting, plus the investor relations presentations for year-end earning calls.

We adopt an item-based dichotomous approach in which the item scores 1 if the KPI is used in the specific part of the disclosure, and 0 otherwise. Our index con-struction follows the stream of literature that uses unweighted items (e.g. Ahmed & Nicholls, 1994; Cook, 1989; Wallace et al., 1994), which means all items of the different disclosure sections are equally important. If an entity uses more than one KPI, the average consistency index for the firm year is used. To capture the im-portance of segment information (Blanco et al., 2015), we require the use of KPIs on a segment level and count the information accordingly. The determination of the consistency index can be summarised as follows:

$$\text{Consistency index} = \frac{T_{k,j} = \sum_{i=i_{1,kj}}^{i_{n,kj}} d_{i,k,j}}{M_{k,j} = \sum_{i=i_{1,kj}}^{i_{n,kj}} d_{i,k,j}}$$

Where:

T = total number of consistent uses of financial KPI ($d_i, 0 \leq i \leq n$)

M = maximum number of applicable financial KPI uses ($d_i, 0 \leq i \leq m, m \geq n$)

k = financial KPI

j = firm

In a first step, we identify the main financial KPIs according to the internal management systems section in the firm's management report. Then we count the use of these KPIs on a segment level in the business review, the outlook, the segment reporting and the investor relations presentations. If the firm declared in the internal management section that the relevant KPI is only used on group level, we require the use only on group level in the applicable sections (group KPIs are not reported in the segment reporting section). Appendix 1 contains examples of how we compute the three consistency indices for the management report, the annual report and the capital market communication.

4.3 Panel Model Development

We constructed the following models to test our hypotheses.

$$CI_{MR} = \alpha + \beta_1 TA + \beta_2 FC + \beta_3 RC + \beta_4 PR + \beta_5 OS + \beta_6 FL + \beta_7 ID + \beta_8 IN \\ + \beta_9 FY$$

$$CI_{AR} = \alpha + \beta_1 TA + \beta_2 FC + \beta_3 RC + \beta_4 PR + \beta_5 OS + \beta_6 FL + \beta_7 ID + \beta_8 IN \\ + \beta_9 FY$$

$$CI_{CMC} = \alpha + \beta_1 TA + \beta_2 FC + \beta_3 RC + \beta_4 PR + \beta_5 OS + \beta_6 FL + \beta_7 ID + \beta_8 IN \\ + \beta_9 FY$$

Where: CI_{MR} = Consistency index for management report; CI_{AR} = Consistency index for annual report; CI_{CMC} = Consistency index for capital market communication; TA = Total assets; FC = Firm complexity; RC = Reporting complexity; PR = Profitability; OS = Ownership structure; FL = Financial leverage; ID = Dummy variables for DAX30 listing, MDAX listing or No index listing; IN = Dummy variables for industries (manufacturing, services or other); FY = Dummy variables for fiscal years from 2009 to 2014. The variables are defined in Appendix 2.

The models with the dependent variables CI_{MR} and CI_{AR} are analysed with the data panel AM because the sample consists of all companies in which we were able to examine the management report and the consolidated financial statements in the annual report. To analyse the determinants of the CI_{CMC} , we use the data panel CMC, for which we are able to acquire the corresponding investor relations presentations.

In line with other studies (e.g. Yekini et al., 2015), we analyse the panel data by using the random effects estimator with generalised least square (GLS). The performance of the Breusch-Pagan test for all three models reveals unobserved heterogeneity in our data samples, which can be solved by using the fixed effects (FE) or random effects (RE) models (Breusch & Pagan, 1980). In order to decide whether the FE or RE is the best statistical approach, we performed the Hausmann test. The test produces results with a significance at a 1% level in favour of the RE

estimator for all three models. We also analyse the data with robust standard errors to adjust all standard errors and p-values for heteroscedasticity.

5 Results and Discussion

5.1 Descriptive Statistics

The descriptive statistics of the consistency indices in Table 3 show a high level of inconsistency in financial KPI reporting concerning all three analysed parts of capital market communication. The average consistency in the period 2009 to 2014 was 46% for CI_{MR} , 50% for CI_{AR} and 50% for CI_{CMC} . Broadly speaking, the companies discussed and reported the KPIs only in 46% or 50% of cases in which the discussion and reporting would have been appropriated. The index scores for the entire period varied significantly from 0,00 to 1,00, which means that companies sometimes do not use the supposed significant financial KPIs in corporate financial disclosures at all (index score 0) or the use of the financial KPIs occurs in all possible instances in the financial communication (index score 1). We find evidence that the consistency in capital market communication and the annual report is higher than in the management report, the equal level of consistency in the annual report and capital market communication with 50% is noteworthy. The details of the time series for all three indices indicate a constant positive development over time. The analysis shows average indices of 36% for CI_{MR} , 39% for CI_{AR} and 38% for CI_{CMC} in 2009, and 60% for CI_{MR} , 64% for CI_{AR} and 62% for CI_{CMC} in 2014. The consistent improvement over time is in line with our hypothesis 3.8 and will be statistically analysed in section 5.3.

[Table 3 about here]

Table 4 reports the data for the independent values for the AR panel as well as the CMC panel. The total assets as a proxy for Size indicate that the companies analysed in our CMC panel are larger than those analysed in our AR panel (mean log of total assets of 16,45 against 16,07). This observation is in line with research findings that bigger companies volunteer more information than smaller ones (Cooke, 1989), because the firms in the CMC panel on average share more data through investor relations presentations.

The two average complexity measures Firm complexity and Reporting complexity are reported as one. This is mathematically required, because both measures compare the actual number of business segments (Firm complexity) or KPIs (Reporting complexity) respective to the average number of these measures in the applicable data panels. The average Profitability as the net income in relation to shareholders' capital is 12% on average for both panels. The percentage of free-floating shares as a proxy for Ownership structure is 76% for the CMC panel, which is higher than the AR panel's 70%. The different Ownership structure values can be explained by the fact that the percentage of DAX30 companies is higher in the CMC panel, and for the DAX30 index the free float is one selection criterion.³ The Financial leverage, measured as the total debt to total equity, is lower for the CMC panel (2,27) compared to 3,03 for the AR panel. This indicates that companies in the AR panel are more dependent on external creditors than those in the CMC panel. Except for the number of KPIs per firm year, all numbers for the independent variables are retrieved from the Datastream Worldscope database.

[Table 4 about here]

³ According to Deutsche Börse index guidelines, the free float market capitalisation is one selection criterion (Deutsche Börse, 2016).

5.2 Univariate Analysis

In table 5 (AR data panel) and table 6 (CMC data panel) the correlations between the variables for our two data panels are reported separately. The significant univariate correlations for the AR data panel give a strong indication that *Firm size* is positively associated with high consistency measures in the management report (CI_{MR}) and the annual report (CI_{AR}). The correlation matrix shows that CI_{MR} as well as CI_{AR} are significantly higher in the last two fiscal years of our analysed period. *Firm complexity* and *Reporting complexity* are therefore significantly positively associated with our consistency measures.

[Table 5 about here]

The univariate correlation analysis in table 6 for the CMC data panel does not support the relationship between size and consistent KPI reporting. However, the significantly positive relationship of consistency with the last two fiscal years in our investigation is supported as well. In addition, the CMC correlation matrix provides evidence that, as expected, *Profitability* is positively related to consistent financial reporting. The results regarding our complexity measures are the same in the CMC correlation matrix as in the AR correlation matrix.

[Table 6 about here]

Multicollinearity is checked with a variance inflation factor (VIF). The dummy variables *Industry: Other* and *MDAX membership* are omitted due to exact collinearity and will therefore not be discussed in the coming section.

5.3 Multivariate Analysis

The regression results for all three dependent variables, CI_{MR} , CI_{AR} and CI_{CMC} , are presented in table 7. The results indicate that the independent variables explain 22% of the variations in the CI_{MR} model, 19% of the variations of the CI_{AR} model and 15% of the variations of the CI_{CMC} model.

As predicted, the sign of the *Firm size* variable is positive for all three models, whereby only significant (at a 5% level) as an explanatory variable for CI_{MR} . The results concerning *Size* differ from other studies (e.g. Hossain & Mitra, 2004) that find evidence for a positive relationship between disclosure quality and the size of a firm. Our statistically insignificant results for CI_{AR} and CI_{CMC} and the unconvincing significance for CI_{MR} can be interpreted to mean that all companies, no matter how big they are, are capable of communicating financial KPIs consistently. Our results do not support the hypothesis that *Firm complexity* is negatively associated with consistent KPI reporting. The *Firm complexity* variables in all three models are positive (and for the CI_{AR} significant at a low 10% level). Taking into account that we use the number of segments compared to the average number of segments as a proxy for *Firm complexity*, we can conclude that firms with an abnormally high number of business segments are capable of reporting KPIs on a segment basis at the same consistency level as companies with a relatively low number of segments. Our result supports the finding of previous studies (Cooke, 1989; Haniffa & Cook, 2002; Courtis, 1978) that companies with a high level of complexity have to disclose more information to ease the information asymmetry between insiders and outsiders. The *Reporting complexity* results contrast our hypothesis that complexity measured by the number of KPIs per firm depresses disclosure quality in terms of consistency. We find strong evidence that more com-

plex financial reporting (e.g. the number of KPIs in financial disclosures) is linked to higher consistency for the models CI_{AR} ($p < 0.05$) and CI_{CMC} ($p < 0.001$). These results can be interpreted to mean that companies with an above average number of KPIs take more effort to report these in all necessary sections of capital market communication than companies with a below average number of KPIs. In line with the literature, we find significant evidence that profitable companies have high quality disclosure concerning consistency ($p < 0.05$ for CI_{AR} and for CI_{CMC}). The results regarding profitability can be interpreted to mean that profitable firms report the favourable development of financial KPIs more often and therefore more consistently in capital market communication. We find inconclusive results for the *Ownership structure* hypothesis. For CI_{MR} , we find, as expected, a positive relationship between the percentage of the free float of shares and consistent KPI reporting ($p < 0.001$). Concerning CI_{AR} and CI_{CMC} , the results are not statistically significant and inconclusive regarding the sign of the coefficients (a negative sign for the CI_{AR} model and a positive one for the CI_{CMC} model). We can therefore argue that the level of corporate governance has no significant impact on consistent reporting of financial KPIs. *Financial leverage* is not found to be a significant predictor of consistent KPI disclosure in all three models. Although our results differ from our hypothesis that the more firms need capital markets for funding, the better the disclosure quality, an explanation could be that KPI reporting is particularly important for equity analysts due to the protective power regarding future profitability (Dorestani & Rezaee, 2011) and not so much regarding credit risk indicators like current liquidity. Aside from slight evidence of a positive relationship between *No membership* of a stock listing index ($p < 0.1$) the results do not indicate any strong or conclusive relationship between index membership and consistent KPI reporting. T-statistics for industry type dummies for CI_{AR} and

CI_{CMC} are insignificant, but significant at a 5% level for the manufacturing industry and at a 10% level for the services industry in the CI_{MR} model. In both cases, the industry type is in a positive relationship with the consistent use of KPIs in the management report. The hypothesis that capital market communication improves over time is supported by all three models ($p < 0.001$). In line with our descriptive finding that the consistency score improves continuously, the multivariate results can be interpreted to mean that companies used the introduction of GAS 20 to improve capital market communication in general. This interpretation is supported by the fact that we see strong positive relationships between all three disclosure index variables for the fiscal years 2013 and 2014, whereby the application of GAS 20 was mandatory from the fiscal year 2013 onwards.

6 Conclusion

The purpose of this paper is to investigate the consistent use of KPIs in capital market communication in Germany and the association of consistency measures with firm-specific determinants. The data panel includes 396 firm years for the period 2009 to 2014. We construct three proxies to investigate the level of consistency in financial KPI reporting: the CI_{MR} (Consistency index for management report), the CI_{AR} (Consistency index for annual report) and the CI_{CMC} (Consistency index for capital market communication).

Firstly, the empirical investigation reveals that there is a high degree of inconsistency in terms of financial KPI reporting. This finding applies regardless of whether the management report (CI_{MR}), the annual report (CI_{AR}) or the capital market communication including the investor relations presentations (CI_{CMC}) are analysed. All three consistency indices improve significantly as of 2013, which was the first application year of the GAS 20 “Group Management Report”. Sec-

ondly, the paper identifies through a random effects regression model that *Reporting complexity* and the *Profitability* are significantly positively associated with the level of consistent KPI reporting. The results regarding *Reporting complexity* support the theory that a company acting in a complex environment spends considerably more resources on an effective management information system in order to help monitor the complex organisation (Haniffa & Cook, 2002) and provides useful information to investors and creditors. The association regarding *Profitability* is an empirically analysed disclosure pattern and theoretically anchored in the signalling theory that states that companies are inclined to disclose positive information in a detailed manner. The paper finds only weak evidence that *Size* or *Firm complexity* positively impacts the consistent reporting of KPIs in the German capital market. The use of external funding (*Financial leverage*) and *Ownership structure* as a proxy for agency costs (the relative free float of shares) is almost statistically insignificant determinants of consistent KPI reporting. The empirical results reveal no convincing relationship between the index listing of the company and the consistent reporting of financial KPIs. The membership of an industry is only identified as a significant explanatory variable for the CI_{MR} . Manufacturing companies are more consistent with KPI reporting in the management report than companies in other industries. This result could not be replicated for the annual report or all capital market communication.

The contribution of this paper is primarily to analyse the status quo of consistent financial KPI reporting in an advanced capital market like Germany and to present empirical evidence regarding relevant firm characteristics of consistent financial KPI reporting. The meagre results regarding consistency indicate that standard setters and regulation bodies should exert more effort to align the different defini-

tions of the key aspects of disclosure requirements (e.g. KPI definitions in local requirements regarding management reports and international accounting standards on consolidated financial statements) and enforce the consistent application.

Our results support the IASB by drafting an internationally accepted accounting standard on management reports, which should be a big step towards eliminating inconsistency between KPI definitions in various reporting regulations. The finding that the GAS clarification on management reporting significantly improved consistency confirms this argument. The findings regarding the firm-specific characteristics that drive consistency should help standard setters and regulatory bodies to improve the regulatory setting of KPI reporting. Of particular interest should be the finding that firm size is not a strong explanatory variable of consistent reporting.

Future research should analyse the consistent reporting of financial as well as non-financial KPIs in additional capital market settings to strengthen our understanding of the explanatory factors of consistent capital market communication. Although there are several studies about the value relevance of financial disclosures, the value relevance of KPIs has not yet received much attention in academia (Leuz & Wysocki, 2008; Elzahar et al., 2015). But for a comprehensive understanding of financial KPIs, the value relevance of KPIs has to be analysed.

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Appendix

Table 1
Sample selection process

	Sample size	
	Firms	Observations
Initial sample of DAX30 + MDAX entities 2009 -2014	80	480
Less bank and insurance entities	7	42
Less missing annual reports	4	24
Less entities not domiciled in Germany	3	18
Final AR sample for the period 2009 to 2014	66	396
Less missing investor relation presentations	33	198
Final CMC sample for the period 2009 to 2014	33	198

^

Table 2
Distribution of sample by industry type and stock market index

Industry	Final AR panel		Final CMC panel	
	Number	%	Number	%
Manufacturing	240	60,61	132	66,67
Services	90	22,73	36	18,18
Other	66	16,67	30	15,15

Index	Final AR panel		Final CMC panel	
	Number	%	Number	%
DAX30	156	39,39	102	51,52
MDAX	212	53,54	92	46,46
None	28	7,07	4	2,02

Table 3
Descriptive consistency indices statistics by year

	2009			2010			2011			2012			2013			2014			2009-2014		
	CI _{MR}	CI _{AR}	CI _{CMC}	CI _{MC}	CI _{AR}	CI _{CMC}	CI _{MR}	CI _{AR}	CI _{CMC}	CI _{MR}	CI _{AR}	CI _{CMC}	CI _{MR}	CI _{AR}	CI _{CMC}	CI _{MR}	CI _{AR}	CI _{CMC}	CI _{MR}	CI _{AR}	CI _{CMC}
Mean	0.36	0.39	0.38	0.40	0.44	0.45	0.41	0.44	0.47	0.44	0.46	0.48	0.58	0.60	0.61	0.60	0.64	0.62	0.46	0.50	0.50
St. Dev.	0.25	0.28	0.26	0.25	0.26	0.23	0.25	0.27	0.25	0.25	0.26	0.24	0.22	0.19	0.18	0.22	0.17	0.17	0.19	0.19	0.19
Median	0.38	0.40	0.40	0.46	0.43	0.40	0.43	0.40	0.49	0.50	0.46	0.49	0.58	0.60	0.60	0.63	0.64	0.60	0.48	0.47	0.47
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.30	0.00	0.30	0.30	0.00	0.16	0.16
Max	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
N	66	66	33	66	66	33	66	66	33	66	66	33	66	66	33	66	66	33	396	396	198

Table 4
Descriptive statistics for independent variables

Variable	AR panel			CMC panel		
	n	Mean	St.dev.	n	Mean	St.dev.
Firm size	396	16,07	1,53	198	16,45	1,61
Firm complexity	396	1,00	0,43	198	1,00	0,42
Reporting complexity	396	1,00	0,75	198	1,00	0,65
Profitability	396	0,12	0,14	198	0,12	0,17
Ownership structure	396	0,70	0,27	198	0,76	0,24
Financial leverage	396	3,03	6,97	198	2,27	1,60

Table 5
Correlation matrix for model CI_{MR} and model CI_{AR}

	CI_{MR}	CI_{AR}	Firm size	DAX30 index listing	MDAX index listing	No index listing	Industry: Manufact.	Industry: Services	Industry: Other	Fiscal year 2009	Fiscal year 2010	Fiscal year 2011	Fiscal year 2012	Fiscal year 2013	Fiscal year 2014	Profitability	Firm complexity	Reporting complexity	Ownership structure	Financial leverage
CI_{MR}	1																			
CI_{AR}		0.765																		
Firm size			0.232																	
DAX30 index listing				0.138																
MDAX index listing					0.053															
No index listing						-0.244														
Industry: Manufacturing							0.101													
Industry: Services								0.018												
Industry: Other									-0.152											
Fiscal year 2009										-0.180										
Fiscal year 2010											-0.109									
Fiscal year 2011												-0.100								
Fiscal year 2012													-0.056							
Fiscal year 2013														-0.018						
Fiscal year 2014															-0.039					
Profitability																-0.051				
Firm complexity																	-0.310			
Reporting complexity																		-0.062		
Ownership structure																			-0.129	
Financial leverage																				-0.249
																				0.017
																				0.163
																				-0.052
																				0.272
																				0.027
																				-0.018
																				-0.002
																				-0.001
																				-0.004
																				0.024
																				0.057
																				0.194
																				0.102
																				1

5 % critical value (two tailed) = 0.0986

Table 6
Correlation matrix for model CI_{CMC}

CI _{CMC}	Firm size	DAX30 index listing	MDAX index listing	No index listing	Industry: Manufacturing	Industry: Services	Industry: Other	Fiscal year 2009	Fiscal year 2010	Fiscal year 2011	Fiscal year 2012	Fiscal year 2013	Fiscal year 2014	Profitability	Firm complexity	Reporting complexity	Ownership structure	Financial leverage
1	0.039	-0.027	0.046	-0.015	0.019	0.044	-0.023	-0.206	-0.075	-0.042	-0.044	0.207	0.161	0.199	0.128	0.186	-0.120	-0.014
Firm size	1	0.025	-0.082	0.055	0.643	-0.196	-0.588	-0.046	-0.017	0.000	0.011	0.014	0.039	-0.170	0.581	0.210	0.193	0.262
DAX30 index listing		1	-0.667	-0.598	0.214	-0.051	-0.201	0.000	0.000	0.000	0.000	0.000	0.000	0.044	-0.026	0.073	-0.139	-0.114
MDAX index listing			1	-0.199	-0.172	0.025	0.165	0.000	0.000	0.000	0.000	0.000	0.000	0.044	-0.157	0.060	-0.115	0.270
No index listing				1	-0.097	0.039	0.086	0.000	0.000	0.000	0.000	0.000	0.000	-0.151	0.203	-0.150	0.307	-0.140
Industry: Manufacturing					1	-0.148	-0.960	-0.027	-0.027	-0.027	0.027	0.027	0.027	-0.117	0.342	0.216	0.353	0.004
Industry: Services						1	-0.134	0.225	0.032	-0.064	-0.064	-0.064	-0.064	-0.145	-0.044	-0.005	-0.079	0.045
Industry: Other							1	-0.036	0.018	0.045	-0.009	-0.009	-0.009	0.158	-0.331	-0.215	-0.331	-0.017
Fiscal year 2009								1	-0.200	-0.200	-0.200	-0.200	-0.200	-0.181	-0.008	-0.110	-0.090	0.077
Fiscal year 2010									1	-0.200	-0.200	-0.200	-0.200	0.121	0.063	-0.125	-0.007	-0.033
Fiscal year 2011										1	-0.200	-0.200	-0.200	0.073	0.041	-0.065	-0.013	-0.083
Fiscal year 2012											1	-0.200	-0.200	-0.062	-0.001	-0.013	0.023	-0.050
Fiscal year 2013												1	-0.200	-0.016	-0.044	0.145	0.020	0.033
Fiscal year 2014													1	0.066	-0.051	0.145	0.067	0.055
Profitability														1	-0.237	0.042	-0.115	-0.268
Firm complexity															1	-0.009	0.183	0.199
Reporting complexity																1	-0.027	0.002
Ownership structure																	1	-0.160
Financial leverage																		1

5 % critical value (two tailed) = 0.1395

Determinants of Consistent Capital Market Communication: Evidence from Germany

Table 7

Random effects model results

Model No.	(I.)		(II.)		(III.)	
Dependent Variable	CI _{MR}		CI _{AR}		CI _{CMC}	
Variables	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
<i>Constant</i>	-0,438	-1,50	0,073	0,23	0,324	0,77
<i>Firm Size</i>	0,033 *	1,71	0,014	0,71	0,000	0,01
<i>Firm Complexity</i>	0,070 *	1,69	0,069	1,58	0,048	0,78
<i>Reporting Complexity</i>	-0,013	-0,76	0,039 **	2,18	0,093 ***	3,81
<i>Profitability</i>	0,074	0,99	0,194 **	2,46	0,198 **	2,20
<i>Ownership Structure</i>	0,111 *	1,88	-0,069	-1,10	0,033	0,33
<i>Financial Leverage</i>	-0,002	-0,57	0,000	0,05	0,009	0,75
<i>DAX30 Index-listing</i>	0,015	0,23	-0,069	-0,99	0,053	0,82
<i>MDAX Index-listing</i>	na	na	na	na	na	na
<i>No Index-listing</i>	0,077 *	1,66	-0,042	-0,85	0,012	0,14
<i>Industry Manufacturing</i>	0,127 **	1,97	0,078	1,12	0,012	0,12
<i>Industry Services</i>	0,134 *	1,77	0,102	1,26	0,011	0,09
<i>Industry Other</i>	na	na	na	na	na	na
<i>Fiscal Year 2009</i>	na	na	na	na	na	na
<i>Fiscal Year 2010</i>	0,021	0,73	0,027	0,92	0,043	1,21
<i>Fiscal Year 2011</i>	0,023	0,83	0,027	0,90	0,060 *	1,66
<i>Fiscal Year 2012</i>	0,050 *	1,77	0,059 **	1,99	0,068 *	1,92
<i>Fiscal Year 2013</i>	0,196 ***	6,67	0,188 ***	6,08	0,185 ***	5,05
<i>Fiscal Year 2014</i>	0,211 ***	7,01	0,222 ***	6,98	0,155 ***	4,12
Firm Years	396		396		198	
Adj. R²	0,2157		0,1851		0,1536	

*This table shows the coefficients and t-statistics for estimating equations (I), (II.) and (III.) as an Random effects regression. ***, **, and * denote p-value significance at the 1%, 5% and 10% levels, with two-tailed tests. All variables are defined in Appendix 1.*

Appendix 1

Examples of consistency indices measuring

Consistency index example - CI_{MR}

	KPI name	Group KPI	MD&A	Outlook	KPI consistency score
1	EBITDA	No	2	2	1
2	Economic value added	No	0	0	0
3	Cash flow	Yes	1	0	0,5
<i>KPI consistency score CI_{MR} for a firm year</i>					0,50

Consistency index example - CI_{AR}

	KPI name	Group KPI	MD&A	Outlook	Segment reporting	KPI consistency score
1	EBITDA	No	2	2	1	0,3
2	Economic value added	No	0	0	0	0
3	Cash flow	Yes	1	0	na	0,5
<i>KPI consistency score CI_{AR} for a firm year</i>						0,28

Consistency index example - CI_{CMC}

	KPI name	Group KPI	MD&A	Outlook	Segment reporting	Investor relations presentation	KPI consistency score
1	EBITDA	No	2	2	1	1	0,86
2	Economic value added	No	0	0	0	0	0
3	Cash flow	Yes	1	0	na	0	0,3
<i>KPI consistency score CI_{CMC} for a firm year</i>							0,40

Appendix 2
Independent variable definitions

Variable	Description	Predicted sign
<i>Firm size</i>	- Logarithmised total assets	+
<i>Firm complexity</i>	- Number of business segments of the firm to the average number of business segments in the data panel	-
<i>Reporting complexity</i>	- Number of reported KPIs of the firm to average number of reported KPIs in the data panel	-
<i>Profitability</i>	- Return on equity calculated as net income divided by total equity	+
<i>Ownership structure</i>	- Percentage of free-floating shares	+
<i>Financial leverage</i>	- Total debt to total equity	+
<i>DAX30 index listing</i>	- Dummy variable equal to 1 if the firm is listed on the DAX30 index and 0 otherwise	+
<i>MDAX index listing</i>	- Dummy variable equal to 1 if the firm is listed on the MDAX index and 0 otherwise	?
<i>No index listing</i>	- Dummy variable equal to 1 if the firm is not listed on the DAX30 or MDAX and 0 otherwise	?
<i>Industry: Manufacturing</i>	-	?
	- Dummy variable equal to 1 if the firm is in the industrial sector and 0 otherwise	?
<i>Industry: Services</i>	- Dummy variable equal to 1 if the firm is in the service sector and 0 otherwise	?
<i>Industry: Other</i>	- Dummy variable equal to 1 if the firm is neither in the industrial or service sector and 0 otherwise	?
<i>Fiscal year 2009</i>	- Dummy variable equal to 1 if the financial reporting period is 2009 and 0 otherwise	?
<i>Fiscal year 2010</i>	- Dummy variable equal to 1 if the financial reporting period is 2010 and 0 otherwise	?
<i>Fiscal year 2011</i>	- Dummy variable equal to 1 if the financial reporting period is 2011 and 0 otherwise	?
<i>Fiscal year 2012</i>	- Dummy variable equal to 1 if the financial reporting period is 2012 and 0 otherwise	?
<i>Fiscal year 2013</i>	- Dummy variable equal to 1 if the financial reporting period is 2013 and 0 otherwise	+
<i>Fiscal year 2014</i>	- Dummy variable equal to 1 if the financial reporting period is 2014 and 0 otherwise	+

V.

THE CAPITAL MARKET RELEVANCE OF CONSISTENT KEY
PERFORMANCE INDICATOR REPORTING: PRELIMINARY EVIDENCE
FROM GERMANY

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V. THE CAPITAL MARKET RELEVANCE OF CONSISTENT KEY PERFORMANCE INDICATOR REPORTING: PRELIMINARY EVIDENCE FROM GERMANY

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THE CAPITAL MARKET RELEVANCE OF CONSISTENT KEY PERFORMANCE INDICATOR REPORTING: PRELIMINARY EVIDENCE FROM GERMANY

Abstract

In this paper, I analyse the link between the consistent use of financial key performance indicators (KPIs) in capital market communication and firm value. To test consistent KPI reporting, I use self-constructed consistency indices of the largest German listed companies. The study covers the period from 2009 to 2014 and consists of up to 372 firm years. I measure firm value as the ratio of market value of equity to the book value of equity. For the majority of capital market communication, I do not find a significant relationship between consistent KPI reporting and firm value. For a link between a consistent index covering the management report and consolidated financial statements and firm value, I find a negative association. These puzzling results, from a traditional perspective, support the view that there are important limitations and unanswered questions. I put these findings into a theoretical and empirical perspective and suggest future research directions.

Keywords: Value relevance; Firm value; Disclosure; Key performance indicators; Germany

1 Introduction

Key performance indicators (KPIs) form the basis of performance assessment of capital market oriented companies (Fee, 2015) and attract increasing attention from standard setters and regulatory authorities. In particular, the European Union (EU, 2003) and the International Accounting Standards Board (IASB, 2010) have strengthened the disclosure requirements for KPIs in the recent past. According to German Accounting Standard 20, German companies have to disclose the KPIs that are used for internal management purposes and have to base the performance discussion and the business outlook in the disclosed management report on these KPIs. Business segment reporting according to IFRS 8 “Operating segments” in the consolidated financial statements as part of the annual report is based on these KPIs. The use of the KPIs of the internal management system in the voluntary part of the financial reporting, such as investor relations slides, is the logical consequence of consistent capital market communication. This consistent use of financial KPIs in the entire capital market communication comprising the management report, the consolidated financial statements, and the investor relations presentations has so far not attracted much attention from academia. The most recent research focused the analysis on KPI disclosure quality in annual reports for UK listed companies (Elzahar et al., 2015).

With my empirical value relevance study of consistent financial KPI reporting, I contribute to the research stream that strives to highlight the complex interplay between accounting and capital markets (Barth et al., 2001). In my study, consistency is defined as the consistent use of financial KPIs across different parts of the capital market communication of year-end results. I base the value relevance analysis on three uniquely constructed consistency indices for German companies spanning the period 2009 to 2014. The development and determinants of these

indices are discussed in Jana et al. (2016). The paper concludes that a low level of consistency in terms of KPI reporting in capital market communication persists and that further efforts from standard setters and enforcement authorities are necessary to improve consistent KPI reporting across the different parts of capital market communication.

The results of my study do not support the value relevance of consistent KPI reporting for the bulk of capital market communication for the largest listed companies in Germany. The empirical link between consistent KPI reporting and firm value is not significant for management reports and all capital market communication. In contrast with my original hypotheses that consistent financial KPI reporting has a positive impact on firm value for all parts of capital market communication, I find a negative association between the level of consistency in terms of KPI usage in annual reports and firm value. I put my results in the perspective of similar results regarding the inconclusive value relevance of disclosure quality (e.g. Botosan, 1997) and give guidance for future research on consistent KPI reporting. In particular, I argue that future research should extend the underlying database to smaller companies with a lower analyst following. For these kinds of companies, the disclosure quality of capital market communication is more important due to the lack of sophisticated financial analysts that are capable to process inconsistent financial information.

The rest of the paper is organized as follows. Section 2 reviews the current literature on value relevance of disclosure quality and the hypotheses tested in this study. In Section 3, I describe the database, the variable measurement and the regression model I used. Section 4 examines the association between firm value and the level of consistency in capital market communication, while Section 5 covers conclusion, limitations, and future research opportunities.

2 Literature Review and Hypotheses Development

A rich stream of accounting literature analyses the effect of disclosure quality on firm value (e.g. Leuz and Verrechia, 2000; Healy and Palepu, 2001; Beyer et al., 2010; Lang and Maffett, 2010). The use of market capitalization as the dependent variable for value relevance testing of disclosure information is quite common (Hassan et al., 2009; Lang et al., 2003). These studies hypothesize that better disclosure quality is positively associated with higher market capitalization due to lower information asymmetry between investors and managers. This line of thinking is firmly based on economic theory (Jensen and Meckling, 1976) and leads to the theoretical result that the value of companies should be positively affected by improved financial transparency and disclosure quality. Despite this theoretical foundation, the empirical testing of this link has so far been inconclusive (Jiao, 2014). For example, Daske (2006) does not find a value effect for companies with better disclosure quality. In contrast with empirical evidence that high quality financial reporting has a positive effect on firm value (Baek et al., 2004; Cheung et al., 2010) some studies even show negative associations between disclosure quality and firm value (Botosan, 1997; Botosan and Plumlee, 2002). To contribute to these value relevance studies, I test whether the consistent usage of KPIs in capital market communication as proxy for disclosure quality has a positive impact on firm value. I follow Lins (2003) and Hassan et al. (2009) in using the ratio of market value of equity to book value equity as the dependent variable for firm value. If the market value is less (greater) than the book value of the equity, it signals an undervaluation (overvaluation) of the company. For the purpose of this study, the market-to-book value ratio (MTBR) is measured as the average share price for the three months after the fiscal year in order to ensure that the market

prices reflect the disclosed accounting information. The numerator book value is the financial year-end number.

In order to analyse the value relevance of consistent financial KPI reporting, I use three unique consistency indices (Jana et al., 2016) as explanatory variables: Consistency index for management report (CI_{MR}); Consistency index for annual report (CI_{AR}); Consistency index for capital market communication (CI_{CMC}). The indices are constructed through an item-based dichotomous procedure in which the item scores 1 if the main KPI according to the internal management system section of the annual report is used in specific parts of the disclosure, and 0 otherwise. The indices are built on each other: the CI_{MR} covers the management report according to HGB and the CI_{AR} measures the consistency of the annual report, including the CI_{MR} and KPI reporting of the segment reporting according to IFRS 8 of the consolidated financial statements. The CI_{CMC} covers the annual report, including the management report and segment reporting, plus the investor relations presentations for year-end earning calls. For further details and examples regarding the consistency indices, I refer to Jana et al. (2016).

The transparent and consistent reporting of KPIs should provide actual and potential investors with information to let them make efficient investment decisions (IASB, 2010). Hence, consistent KPI usage in capital market communication should increase the demand for shares of the reporting entity and increase the firm's market capitalization. Previous studies (Elzahar et al., 2015; Dorestani and Rezaee, 2011) found empirical evidence for economic consequences of high quality KPI reporting and firm value. Elzahar (2015) reports a positive relationship between the disclosure quality of financial KPIs and firm value for a sample of UK listed companies for the period 2006 to 2010. The value relevance of KPIs

for US listed companies is analysed by Dorestani and Rezaee (2011). They found a link between a change in KPI reporting and the accuracy of analyst forecasts.

Based on previous studies and the theoretical benefits of better financial reporting quality, I developed the following hypothesis:

H1: The level of consistent financial KPI reporting is positively associated with the firm value of a company.

I incorporate a few control variables in my value relevance model framework: firm size, profitability, financial leverage, and growth. Previous studies found that the firm size measured by total assets is positively associated with the market capitalization of firms (Berk, 1995; Bowen et al., 2002; Lins, 2003). Following these empirical findings and the theoretical argument of economies of scale in general, I hypothesize that larger firms report more consistently than smaller firms. I proxy the firm size with the natural log of the book value and assume a positive relationship between the variable and the dependent variable MTBR. Due to the theoretical basis of profitability as one of the main explanatory variables for firm value (Olson, 1995) and various empirical findings (Orens et al., 2009; Leuz and Wysocki, 2016) I control for profitability in my model with the ratio return on equity calculated as net income divided by total equity. Regarding financial leverage, I assume that a higher need of external funding lessens the agency problem due to intensified creditor monitoring and consequently increases the value of the equity (Jensen and Meckling, 1976). To capture this leverage effect on the market value of a firm, I proxy the financial leverage as the ratio of total debt to total equity and expect a positive sign for the variable. According to Hassan et al. (2009) and Lang et al. (2003) the growth momentum of companies has a statistically significant impact on their firm value. I control for this growth effect with the incor-

poration of the sales growth measured as the sales in the current fiscal year divided by sales in the previous fiscal year in my model. Finally, I incorporate dummies for fiscal years and industry membership.

3 Data Collection and Variable Measurement

3.1 Panel Data Structure

I analyse a data set of the largest German listed companies over the period from 2009 to 2014. The panel consists of the 80 companies listed on the stock market indices DAX30 and MDAX in December 2014. In line with the empirical literature on value relevance, I exclude financial services firms because of industry-specific disclosure requirements and practices (Tsalavoutas et al., 2012). Due to the centrepiece function of the management report for our KPI consistency indices, I must exclude companies that are not based in Germany because they are not required to prepare and disclose a management report according to HGB. Further data restrictions (e.g. missing annual reports and capital markets data) also limited the data panel.

[Table 1 about here]

The availability of investor relations is quite limited and I therefore work with two panels: The annual reports (AR) panel consists of 62 companies, while the capital markets communication (CMC) panel contains only 33 companies. The models with the explanatory variables CI_{MR} and CI_{AR} are analysed with the data panel AM because both variables cover only the consistency of KPI reporting within the annual report. To analyse the value relevance of capital market communication in its entirety (CI_{CMC}) including the investor relations presentations, I use the data panel CMC.

The industry structure of the AR panel and CMC panel is reported in Table 2. In both panels, the manufacturer category represents the majority of analysed companies (61,29% and 66,67%, respectively).

[Table 2 about here]

3.2 Variables Measurement

The variable data for the two panels is reported in Table 3. I follow the literature (Barth et al., 2008; Elzahar et al., 2015) and deflate all financial variables by the number of outstanding shares. The dependent variable MTBR as proxy for firm value with 2,4 average for the AR panel and 2,5 for the CMC panel indicates that the reported book values of equity represent less than 50% of the market value as perceived by investors. All three consistency indices indicate a high level of inconsistent financial KPI reporting: the analysis shows average indices of 47% for CI_{MR} , 49% for CI_{AR} , and 50% for CI_{CMC} for the period 2009 to 2014. These numbers can be interpreted as that the KPI reporting is only consistent in 47%, 49%, or 50% of cases. The index scores for the entire period varied from 0,00 to 1,00, which means that companies sometimes do not use the supposed significant financial KPIs in corporate financial disclosures at all (index score 0), or the use of the financial KPIs occurs in all possible instances in the financial communication (index score 1). The data points to initial evidence that the level of consistency in capital market communication (50%) and the annual report (49%) is higher than in the management report (47%). The average *firm size* reported as the natural log of total assets is in both panels comparable with 16,09 in the AR panel and 16,45 in the CMC panel. The high standard deviation of 1,68 and 1,96 for this variable shows how diverse companies are in terms of firm size. The profitability with a 12% return on equity is identical for both data panels. The growth momentum of

the firms, measured as the ratio of current sales divided by the sales in the previous fiscal year, is 5,44 and 5,78, respectively. These numbers indicate that the biggest German listed companies on average experienced a healthy growth momentum in the analysed time period. The financial leverage, with 3,00 on average for the AR panel, is significantly higher than the leverage of 2,27 in the CMC panel. The difference indicates that firms in the AR panel are more dependent on external funding than those in the CMC panel.

The data for the consistency indices are hand collected from the annual reports and investor relation slides. All other data is obtained from the Datastream Worldscope database.

3.3 Regression Model

The following models have been developed to analyse the value relevance of the three consistency indices while controlling for the abovementioned variables:

$$\text{Model 1: } FV = \alpha + \beta_1 PR + \beta_2 FL + \beta_3 GR + \beta_4 FS + \beta_5 IN + \beta_6 FY + \beta_7 CI_{MR}$$

$$\text{Model 2: } FV = \alpha + \beta_1 PR + \beta_2 FL + \beta_3 GR + \beta_4 FS + \beta_5 IN + \beta_6 FY + \beta_7 CI_{AR}$$

$$\text{Model 3: } FV = \alpha + \beta_1 PR + \beta_2 FL + \beta_3 GR + \beta_4 FS + \beta_5 IN + \beta_6 FY + \beta_7 CI_{CMC}$$

Where: FV = Firm value; PR = Profitability; FL = Financial leverage; GR = Growth; FS = Firm size; IN = Dummy variables for industries (manufacturing, services or other); FY = Dummy variables for the fiscal years 2009 to 2014; CI_{MR} = Consistency index for management report; CI_{AR} = Consistency index for annual

report; CI_{CMC} = Consistency index for capital market communication. The variables are defined in Appendix 2.

The model is based on prior studies (Ousama et al., 2011; Orens et al., 2009; Hassan et al., 2009). The theoretical framework to combine financial data with non-financial information was introduced by Ohlson (1995). In this study, the consistency indices are used as non-financial information that capital market participants use for investment decisions. Taking into account the results of the Breusch-Pagan test that my data suffers from unobserved heterogeneity, I use as a fixed effects estimator with generalized least squares. The effectiveness of the random effects estimator was rejected after performing the Hausmann test.

4 Results and discussion

4.1 Univariate Analysis

In Table 3 and Table 4, the correlations for the two data panels AR and CMC are presented. The AR panel is used to test whether the consistent usage of KPIs in management reports (CI_{MR}) or annual reports (CI_{AR}) is value relevant and the corresponding correlations are reported in Table 3.

[Table 3 about here]

The correlation data for the value relevance testing of capital market communication in its entirety (CI_{CMC}) is reported in Table 4.

[Table 4 about here]

The tables report the correlation between firm value and the three consistency indices as well as the additional explanatory variables. For all three consistency indices, the correlation matrix reports significant positive relationships between

the consistent usage of financial KPIs in financial reporting and firm value ($CI_{MR} = 0,111$; $CI_{AR} = 0,130$; $CI_{CMC} = 0,220$). The signs of the other continuous variables in both correlation matrices show the expected positive relationships. Based on the univariate analysis, I expect that the consistent reporting of KPIs, the profitability, the financial leverage, the growth momentum, and the firm size are positively associated with the value of the firm.

The multicollinearity is checked by computing the variance inflation factor (VIF). The dummy variables for industry type are omitted due to exact collinearity and are therefore not part of the analysis discussion.

4.2 Multivariate Analysis

The fixed effects regression model results are reported in Table 6. The specified models can explain 25% in the firm value variation in Model 1 (CI_{MR}) and Model 2 (CI_{AR}), while Model 3 (CI_{CMC}) reaches an explanatory power of 35%.

The independent variable *Profitability* is positive in all three models and significant at a 5% level with the explanatory variables CI_{MR} and CI_{AR} . For Model 3, with CI_{CMC} as the explanatory variable for non-financial information, the statistical relationship is only significant at a 1% level. These results are in line with my hypotheses and are empirically as well as theoretically supported by various academic studies (Leuz and Wysocki, 2016). The growth momentum captured by the variable *Growth* represents a positive and significant association with *firm value* in all three models (CI_{MR} and CI_{AR} ($p < 0.05$); CI_{CMC} ($p < 0.01$)). This empirical result supports the investment concept of growth stocks and demonstrates that companies with an above average growth rate can on average enjoy more favorable market values (Baumann et al., 1998). I find no empirical support for the notion that *financial leverage* as a proxy for dependence on external funding has a signif-

icant association with *firm value*. Because my data sample originates from a fairly developed capital market environment and a strong corporate governance culture can be assumed for the selected firms, it could be argued that the usual positive effect of external monitoring by debt holder does not play such an important role in Germany in terms of market valuation (Lins, 2003). The *firm size* results contrast my hypothesis that higher total assets of a company correlate with a higher *firm value*. This result could be explained by the fact that the panel structure comprises fairly large companies because all companies are listed on the major German stock market indices and belong to the biggest companies in Germany.

The results regarding the explanatory variables of consistent KPI reporting are puzzling and reflect the conflicting empirical results from the academic literature on value relevance of disclosure quality in general (Leuz and Wysocki, 2016). In all three models, the sign for the consistency variables (CI_{MR} , CI_{AR} and CI_{CMC}) are negative. These results reject my hypothesis that the consistent usage of KPI in capital market communication has a positive impact on *firm value*. The coefficients for the KPI reporting in annual reports (CI_{AR}) and in capital market communication (CI_{CMC}) are statistically insignificant. Although I formulated the hypothesis of a positive empirical relationship between consistent KPI reporting and the market value of companies, I do find theoretical explanations for my results. As outlined above, my study covers the biggest stock market listed companies in Germany. As a prerequisite to joining the DAX30 and MDAX indices, the companies must have above average market capitalization and above average market liquidity in terms of share trading (Deutsche Börse, 2016). These kinds of characteristics lead to above average analyst coverage. In general, analysts are quite sophisticated as well as capable of processing financial disclosures efficiently, even in tough reporting environments like inconsistent KPI reporting, and nevertheless

conclude beneficial investment advice. Consequently, empirical evidence shows that an economic consequence like firm value is more sensitive to disclosure quality if companies are not covered by analysts because actual and potential investors lack the information processing capabilities of professional financial intermediaries like analysts (Dorestani and Rezaee, 2011; Botosan 1997). The results of Model 2 with the consistency index CI_{AR} reports a significant negative relationship between consistent KPI reporting in annual reports and *firm value* ($p < 0.05$). Although this result contradicts my hypothesis of a positive relationship between consistency and market valuation, the negative association can also be defended by economic theory. Wagenhofer (2004) explains that it is possible that increased disclosure quality could lead to negative economic consequences due to the competitive disadvantage resulting from the dissemination of sensitive information. The consistency index CI_{AR} covers the management report and business segment reporting, which leads to the argument that the distribution of sensitive KPI information in the segment reporting note could potentially have a negative effect on the company's market value. This line of thinking is supported by the empirical finding of Bugeja et al. (2015). These authors demonstrate empirically that successful firms are reluctant to provide segment information when most of their segments are profitable. Owing to the assumed decision usefulness of the KPI information in the business segment note and the dependence of the CI_{AR} on this information, this could be the case for the consistency index CI_{AR} model 2.

4.3 Robustness Check

As mentioned above, my multivariate regression model is based on the Ohlson model (Ohlson, 1995). Although I use the model as the foundation of my regression, I refined it according to various studies that developed the model further

(Ousama et al., 2011; Orens et al., 2009; Hassan et al., 2009). In its original setting, the model represents the market value of firm (MV) as a linear function of book value of equity (BV), net income (NI), and other non-financial information (OFI).

$$MV = \beta_0 + \beta_1 BV + \beta_2 NI + \beta_3 OFI$$

To test the robustness of my regression results, I used the Ohlson model which is still used in its original setting (e.g. Elzahar et al., 2015). I recalculate all three models with the different explanatory variables (CI_{MR} , CI_{AR} and CI_{CMC}) as other non-financial information (not tabulated). The results confirm the results discussed above.

5 Conclusion, Limitations and Future Research

This empirical study uses panel data to investigate the relationship between *firm value* and the consistent use of financial KPIs in capital market communication in Germany. The panel consists of 372 firm years for the period 2009 to 2014. I use self-developed and collected consistency indices (Jana et al., 2016) for management report (CI_{MR}), annual report (CI_{AR}) and capital market communication (CI_{CMC}) as explanatory variables for *firm value*. The regression model is specified to control for *firm size*, *profitability*, *financial leverage*, and *growth*. My results show no significant association between *firm value* and the level of consistency in the management report (CI_{MR}) and the capital market communication (CI_{CMC}). The results regarding CI_{AR} show a negative significant relationship between the level of consistency in the annual report and the *firm value*.

Although the paper provides preliminary evidence that the consistent use of KPIs in a large part of the capital market communication does not have an effect on the stock valuation of companies, standard setting bodies (IASB, 2010), regulatory authorities (FREP, 2014), and financial analysts (AICPA, 1993) articulate in various forms the need for consistent capital market communication. To some extent, my results are in line with other empirical studies that analyze the economic effects of disclosure quality and find no such link (Holthausen and Watts, 2001).

Despite the negative report of my results in respect of positive value effects on companies with consistent KPI reporting, I do not see the quest of relevant KPI reporting undermined by my study. My results are based on the largest listed companies in Germany; therefore a key limitation of my study is the focus on companies with a high analyst following. Previous research demonstrated that the economic effects of below average disclosure quality for companies with a high analyst following is insignificant, because analysts are highly sophisticated in processing even low quality financial disclosure information and nevertheless formulate efficient investment advice (Botosan, 1997). This causal relationship is not relevant for smaller companies with a lower analyst following, because the informed and sophisticated analysts are not in place and the disclosure quality therefore matters more for investment decisions. Future research should extend the data panel towards small capitalized companies in Germany, such as SDAX and TecDAX companies. Future research could also extend the analysis to additional proxies for economic effects on disclosure. In particular the testing of market liquidity and the cost of capital should be a fruitful contribution to the stream of academic literature on the link between disclosure quality and capital market effects.

While it is not said that the negative relationship between annual report consistency and *firm value* holds true for an extended panel with small capitalized firms, the result of this study with fairly large listed companies shows the importance of segmental information. My findings provide preliminary evidence that companies structure their financial reporting towards hiding the KPI information of profitable segments. This finding supports the current efforts of enforcement agencies in Europe to ensure that companies report their KPIs consistently across all capital market communication.

Finally, it might be of interest to conduct an empirical study on the economic effects of consistent KPI reporting for capital markets other than Germany. Of particular interest would be studies in countries where IFRS is also mandatory for capital market oriented companies in order to support the IASB in developing a widely accepted and beneficial accounting standard for a globally harmonized management report (IASB, 2005).

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Appendix

Table 1
Sample selection process

	Sample size	
	Firms	Observations
Initial sample of DAX30 + MDAX entities 2009-2014	80	480
Less bank and insurance entities	7	42
Less missing annual reports	4	24
Less entities not domiciled in Germany	3	18
Less missing capital market data	4	24
Final AR sample for the period 2009-2014	62	372
Less missing investor relation presentations	29	198
Final CMC sample for the period 2009-2014	33	174

Table 2
Distribution of sample by industry type

Industry	Final AR panel		Final CMC panel	
	Number	%	Number	%
Manufacturing	228	61,29	132	66,67
Services	84	22,58	36	18,18
Other	60	16,13	30	15,15

Table 3
Descriptive statistics for variables

Variable	AR panel						CMC panel					
	n	Mean	Median	Min	Max	St. dev.	n	Mean	Median	Min	Max	St. dev.
Firm value	372	2,40	2,01	0,48	12,51	1,68	198	2,50	2,06	0,60	12,51	1,96
Firm size	372	16,09	15,86	12,58	19,66	1,56	198	16,45	16,22	13,46	19,66	1,61
Profitability	372	0,12	0,12	-0,74	0,85	0,15	198	0,12	0,12	-0,74	0,68	0,17
Growth	372	5,44	4,62	-49,88	93,94	14,21	198	5,78	4,87	-42,80	57,99	13,41
Financial leverage	372	3,00	1,85	0,28	67,85	7,09	198	2,27	1,94	0,33	12,40	1,60
CI _{MR}	372	0,47	0,50	0,00	1,00	0,26	n/a	n/a	n/a	n/a	n/a	n/a
CI _{AR}	372	0,49	0,50	0,00	1,00	0,26	n/a	n/a	n/a	n/a	n/a	n/a
CI _{CMC}	n/a	n/a	n/a	n/a	n/a	n/a	198	0,50	0,48	0,00	1,00	0,24

Table 4
Correlation matrix for Model CI_{MR} and Model CI_{AR}

	Profitability	Financial leverage	CI_{MR}	CI_{AR}	Growth	Firm value	Firm size	Industry: Manufacturing	Industry: Services	Industry: Other
Profitability	1									
Financial leverage		1								
CI_{MR}			1							
CI_{AR}				1						
Growth					1					
Firm value						1				
Firm size							1			
Industry: Manufacturing								1		
Industry: Services									1	
Industry: Other										1

5% critical value (two-tailed) = 0.1017

Table 5
Correlation matrix for Model CI_{CMC}

	Profitability	Financial leverage	CI _{CMC}	Growth	Firm value	Firm size	Industry: Manufacturing	Industry: Services	Industry: Other
Profitability	1	-0,268	0,199	0,347	0,516	-0,170	0,044	0,044	-0,105
Financial leverage		1	-0,014	-0,126	0,005	0,262	-0,114	0,270	-0,140
CI _{CMC}			1	-0,010	0,220	0,039	-0,027	0,046	-0,015
Growth				1	0,052	-0,039	-0,068	-0,062	0,157
Firm value					1	-0,407	0,177	0,016	-0,249
Firm size						1	0,025	-0,082	0,055
Industry: Manufacturing							1	-0,667	-0,598
Industry: Services								1	-0,199
Industry: Other									1

5% critical value (two-tailed) = 0,1395

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Table 6

Fixed effects model results

Model number	(I.)		(II.)		(III.)	
Dependent variable	Firm value		Firm value		Firm value	
Variables	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
<i>Constant</i>	13,278	1,0331	13,849	1,064	36,403	1,495
<i>Profitability</i>	0,972 **	1,983	1,077 **	2,272	0,867 *	1,969
<i>Financial leverage</i>	0,026	0,6197	0,022	0,549	0,087	1,196
<i>Growth</i>	0,013 *	1,9061	0,013 *	1,850	0,028 **	2,095
<i>Firm size</i>	-0,706	-0,8715	-0,730	-0,894	-2,099	-1,417
<i>CI_{MR}</i>	-0,030	-0,1039				
<i>CI_{AR}</i>			-0,528 **	-2,377		
<i>CI_{CMC}</i>					-0,378	-0,900
<i>Year dummies</i>	Included		Included		Included	
Firm years	372		372		198	
R²	0,2461		0,2461		0,3541	

*This table shows the coefficients and t-statistics for estimating equations (I.), (II.), and (III.) as a random effects regression. ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in Appendix 1.*

Appendix 1

Variable definitions

Variable	Description	Predicted sign
<i>Firm value</i>	- Average market value of equity of the three months after financial year-end to book value of equity at financial year-end	n/a
<i>Firm size</i>	- Logarithmized total assets	+
<i>Profitability</i>	- Return on equity calculated as net income divided by total equity	+
<i>Growth</i>	- Sales in the current fiscal year divided by sales in the previous fiscal year	+
<i>Financial leverage</i>	- Total debt to total equity	+
<i>Industry: Manufacturing</i>	- Dummy variable equal to 1 if the firm is in the industrial sector, and 0 otherwise	?
<i>Industry: Services</i>	- Dummy variable equal to 1 if the firm is in the service sector, and 0 otherwise	?
<i>Industry: Other</i>	- Dummy variable equal to 1 if the firm is not in the industrial or service sector, and 0 otherwise	?



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