Tax Accounting and Reporting Behavior: Empirical Evidence on the Effects of Book-Tax Conformity and Current Trends in Europe

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Ina Meier

Saarbrücken

Dekan:	Prof. Dr. Dieter Truxius
Referent:	Prof. Dr. Christoph Spengel
Korreferent:	Prof. Dr. Jannis Bischof
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List of Abbreviations

AAER	Accounting and Auditing Enforcement Release
AGI	Allowance for Growth and Investment
AMT	Annual Minimum Tax
Art.	Article
BEPS	Base Erosion and Profit Shifting
BilMoG	Bilanzrechtsmodernisierungsgesetz
BMF	Bundesministerium der Finanzen
bn	Billion
BRIC	Brazil, Russia, India, China
BTC	Book-Tax Conformity
BTD	Book-Tax Differences
CbC(R)	Country-by-Country (Reporting)
CC(C)TB	Common (Consolidated) Corporate Tax Base
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIT	Corporate Income Tax
COLI	Corporate-owned Life Insurance
CRD IV	Capital Requirements Directive IV
CSR	Corporate Social Responsibility
CTE	Current Tax Expense
CV	Curriculum Vitae
DA	Discretionary Accruals
DD	Draft Directive
DiD	Difference-in-Differences
DTAX	Discretionary Permanent BTD
EBIT	Earnings before Interest and Taxes
EBITDA	Earnings before Interest, Taxes, Depreciation and Amortization
EC	European Commission
ECB	European Central Bank
ECJ	European Court of Justice
Ed(s).	Editor(s)
EITI	Extractive Industries Transparency Initiative
EM	Earnings Management
EStG	Einkommensteuergesetz
EStR	Einkommensteuerrichtlinie
ETR	Effective Tax Rate
EU	European Union
EUR	Euro
EY	Ernst & Young

FAS	Financial Accounting Standard
FAZ	Frankfurter Allgemeine Zeitung
FDI	Foreign Direct Investment
FIFO	First-In First-Out
FIN	FASB Interpretation Number
GAAP	Generally Accepted Accounting Principles
GAO	General Accounting/Government Accountability Office
GewStG	Gewerbesteuergesetz
GmbH	Gesellschaft mit beschränkter Haftung
HGB	Handelsgesetzbuch
HKEX	Hong Kong Stock Exchange
IAS	International Accounting Standards
IDW	Institut der Wirtschaftsprüfer
IFRS	International Financial Reporting Standards
IP	Intellectual Property
IRC	Internal Revenue Code
IRS	Internal Revenue Service
IT	Informationstechnik
k	Thousand
KStG	Körperschaftsteuergesetz
LIFO	Last-In First-Out
Ltd.	Limited
MaTax	Mannheim Taxation Science Campus
Max.	Maximum
MCAA	Multilateral Competent Authority Agreement
Min.	Minimum
mn	Million
MNC	Multinational Corporation
MNE	Multinational Enterprise
MRA	Meta-Regression Analysis
MU	Monetary Unit
Neg.	Negative
NGO	Non-governmental Organization
No.	Number
NOL	Net Operating Loss
Obs.	Observations
OECD	Organization for Economic Co-Operation and Development

OLS	Ordinary Least Squares
OTSA	Office of Tax Shelter Analysis
P/E Ratio	Price/Equity Ratio
Par.	Paragraph
PE	Private Equity
P-LTU	Compromise Proposal of Lithuania
Pos.	Positive
PPE	Property, Plant and Equipment
PTBI	Pre-Tax Book Income
p-value	Probability-value
R&D	Research and Development
RMSE	Root Mean-Squared Error
RNOA	Return on Net Operating Assets
ROA	Return on Assets
ROE	Return on Equity
RückAbzinsV	Rückstellungsabzinsungsverordnung
S.	Sentence
SE	Standard Error
SEC	Securities and Exchange Commission
Sec.	Section
Sign.	Significant
SME	Small and Medium Enterprises
SolZ	Solidaritätszuschlag
TA	Total Accruals
TI	Taxable Income
TS	Tax Sheltering
UmwStG	Umwandlungssteuergesetz
US	United States
USD	US-Dollar
UTB	Unrecognized Tax Benefits
ZEW	Zentrum für Europäische Wirtschaftsforschung/Centre for European Economic Research

1 Introduction

The conceptual design of tax accounting regulations and the corresponding reporting behavior of corporations have been subject to intense discussion during the last decade. In particular, there is not yet a clear opinion on the appropriate extent to which book and tax accounts should be aligned (degree of book-tax conformity), and on whether a one-book system (strong alignment) or a two-book system (far-reaching detachment) better complies with the objectives of financial and tax accounting. While a one-book system could potentially limit opportunistic reporting behavior (earnings management and tax sheltering), as firms face a trade-off between reporting preferably high financial income vs. a low tax base, an alignment could also lead to a loss of valuable information because financial and tax accounts serve different objectives and are targeted at different recipients. The (empirical) evidence on the true effects (benefits and costs) of book-tax conformity is, however, not yet unambiguous. In the US, various reporting scandals (such as Enron) have triggered a call for a stronger alignment of both reporting lines. Several other countries, such as Germany, by contrast, have recently moved towards a separation of financial and tax reporting (e.g. Accounting Law Modernization Act in 2010).

Besides these unilateral developments and the ongoing unresolved book-tax conformity debate, there are several supranational trends and economic influencing factors which might prospectively affect tax accounting and tax reporting. The topic of the harmonization of tax accounting within the European Union (EU) has, for example, gained increasing attention over the last few years. Accordingly, the European Commission has proposed a first draft directive for a "Common (Consolidated) Corporate Tax Base" in 2011 (European Commission (2011)). This concept would induce a full detachment of the determination of taxable profits from financial accounts, and thus imply a transition to a two-book system in all European countries. Recently, a staged introduction of a Common (Consolidated) Corporate Tax Base has been put on the agenda by the "Action Plan for a Fairer and Efficient Corporate Tax System" (European Commission (2015a)) as a measure against profit shifting and is also included in the revised proposal for a Council Directive on a Common (Consolidated) Corporate Tax Base, which was published in October 2016 (European Commission (2016e, 2016f)). These proposals perfectly fit into the general discussion around the fight against Base Erosion and Profit Shifting (BEPS) which has been the predominant tax issue over the last years. The starting points were tax planning efforts of highly profitable US multinationals such as Google, Apple or Amazon and their extremely low effective tax rates on their non-US profits. As a countermeasure to these profit shifting activities, the Organization for Economic Co-Operation and Development (OECD) released a global action plan in 2013 aimed at closing loopholes that facilitate tax

avoidance and at finding solutions to today's tax challenges. Arguing that a lack of transparency facilitates profit shifting, the OECD action plan also includes – among other things – specific actions aimed at enhancing the quality of tax reporting, such as a proposal for a so-called Country-by-Country Reporting, i.e. a country-specific reporting of certain tax information. Apart from these initiatives on the EU and OECD level, several general economic influencing factors and the market environment might potentially impact on tax accounting. One example is the persistent low interest environment prevailing since the financial crisis in 2008.

Against this background, this dissertation focuses on and aims to add to the outlined multiple dimensions of tax accounting and tax reporting. It consists of three main chapters which include five self-contained papers: Chapter 2 and chapter 3 contain two separate empirical analyses directly contributing to the international book-tax conformity debate. The aim is to provide further evidence on the research question of the true effects and characteristics of one-book and two-book systems and to derive propositions on the appropriate degree of book-tax conformity. Chapter 4, comprising three subchapters, covers and examines the different outlined trends and developments in the field of tax accounting and tax reporting in Europe.

Chapter 2[1] builds on the fact that a huge body of tax accounting literature has emerged especially in the US over the last decade(s) (Hanlon and Heitzman (2010)). In this regard, we provide a comprehensive and systematic literature review covering the two identified major strands of literature dealing with the association between book-tax conformity (or book-tax differences) and opportunistic reporting behavior. Beyond a qualitative literature survey, heterogeneity in measures used as well as in reported findings in primary studies induces us to use quantitative meta-analysis techniques (i.e. meta regression analysis) to identify the determinants of why empirical findings significantly vary and to provide more general conclusions based on a quantitative synthesis of prior findings. To this end, we derive a consensus estimate in terms of the sign and statistical significance on the association between book-tax differences and earnings management/tax sheltering in order to examine whether book-tax conformity is indeed effective in reducing aggressive reporting behavior. In addition, we derive insights on the direction and significance of major drivers and determinants of book-tax differences.

[1] This is joint work with Maria Theresia Evers and Katharina Nicolay and is forthcoming as ZEW discussion paper. The paper is submitted to Review of Accounting Studies.

Chapter 3[2] addresses the fact that empirical evidence on tax accounting in Europe and, in particular, in Germany is still rare, even though the topic is, as outlined, of high relevance at the European level. In addition, there are only few papers which observe a real change in book-tax conformity and most existing studies have to rely on proxies for tax variables as they have no access to information on true taxable income. In our study, we are able to examine a setting in which firms have been subject to a comprehensive change in conformity as a consequence of the Accounting Law Modernization Act (*Bilanzrechtsmodernisierungsgesetz*) in Germany in 2010. To that end, we employ a dataset of linked individual financial statements and actual tax return data for 150 incorporated firms, thus avoiding problems of approximating taxable income. Exploiting this exceptional change in conformity and our unique dataset, we contribute to the ongoing debate and the existing literature on the impact of book-tax conformity on reporting behavior. We assess whether the new reporting discretion resulting from the decrease in book-tax conformity is actually exploited despite additional requirements to document deviations between financial and tax accounting. Using individual financial and tax accounts allows us to attribute the change in book-tax differences to tax sheltering rather than to financial earnings management. Secondly, we examine how the change in book-tax conformity affects the persistence of taxable and financial income. This analysis provides an additional test demonstrating that the newly introduced scope for opportunistic reporting behavior induces tax sheltering rather than earnings management.

Chapter 4.1[3] deals with the proposal for a Common (Consolidated) Corporate Tax Base to harmonize tax accounting in Europe. Even if the proposed rules for profit determination can, in principle, be considered as appropriate to align the tax base, they lack detailed definitions of legal terms such that there are numerous regulatory gaps as well as discretion in reporting. These cannot be eliminated uniformly by referring to national (civil) laws. Against this background, we intend to substantiate the principles for the harmonized determination of taxable profits based on a cash flow-oriented taxation/modified net income method. This concept would gear profit determination more strongly towards the cash-principle and limit accrual accounting and periodical adjustments as far as possible. Thus, it would lead to more clarity and uniformity and, at the same time, induce a transition to a two-book system.

[2] This is joint work with Maria Theresia Evers and Katharina Nicolay. An earlier version of the paper has been circulated as ZEW discussion paper (Evers et al. (2016)) and the paper is submitted to European Accounting Review.

[3] This is joint work with Maria Theresia Evers, Melanie Köstler, Katharina Nicolay, Wolfram Scheffler and Christoph Spengel. The chapter is based on earlier versions of the paper published by Steuer und Wirtschaft (Evers et al. (2015)) and circulated as ZEW discussion paper (Evers et al. (2014a)).

Chapter 4.2[4] aims at analyzing the current proposals of the OECD and the European Commission for a comprehensive Country-by-Country Reporting. Our major goal is to evaluate whether these initiatives for enhanced transparency in tax reporting are appropriate to prevent multinationals from profit shifting. By doing so, we, in particular, assess potential sources for providing the relevant information as well as related benefits and costs. Finally, we provide potential alternatives for curbing international profit shifting.

Chapter 4.3[5] deals with the question on how the persistent low interest environment impacts on the various tax (accounting) dimensions in Germany. These include the direct effects of the interest expense on taxable profits of corporations, interest and liquidity effects of taxation as well as the repercussions caused by the low interest environment on the valuation of provisions under financial and tax accounting as well as the resulting book-tax differences. It is therefore the aim of this chapter to identify and analyze the respective interdependencies as well as to provide possible options for reform.

Chapter 5 finally closes with a general conclusion summarizing the most important results of the separate chapters as well as contextualizing the major findings.

The papers included in this dissertation have been originally written as submissions for publications in taxation and accounting journals. Thereby, the papers are the work of multiple authors. Table 1 acknowledges the different co-authors and provides information on the current publication status for each paper. In addition, it highlights the key contributions of the author to the single papers of this dissertation.

[4] This is joint work with Maria Theresia Evers and Christoph Spengel. The paper has been awarded by the "Stiftung Wissenschaftsform Wirtschaftsprüfung und Recht" with the "Stiftungspreis 2016". An earlier version of the paper has been published by Bulletin for International Taxation (Evers et al. (2014b)).

[5] This is joint work with Christoph Spengel. The chapter is based on a paper published by Finanz-Rundschau (Spengel and Meier (2016)).

Table 1: Co-Authors and Publication Status of Papers

Paper	Co-Authors	Publication Status	(Own) Key Contribution
1 Effects and Drivers of Book-Tax Differences: Literature Review and Meta-Analysis	Ina Meier, Katharina Nicolay, Maria Theresia Evers	Under review in *Review of Accounting Studies*	- Introduction and positioning of the study - Qualitative literature survey - Development of conceptual design of the quantitative meta study - Data collection and coding of primary studies - Descriptive analysis - First analyses (part 2) - Discussion of results (part 1) - Implications for research/politics
2 Book-Tax Conformity and Reporting Behavior - A Quasi-Experiment	Ina Meier, Katharina Nicolay, Maria Theresia Evers	Under review in *European Accounting Review*	- Introduction and positioning of the study - Qualitative literature survey and institutional background - Development of data collection concept and application - Development of hypotheses - Difference-in-Differences analysis - Implications for research/politics
3 Gemeinsame Körperschaftsteuer-Bemessungsgrundlage in der EU: Konkretisierung der Gewinnermittlungsprinzipien und Weiterentwicklungen	Christoph Spengel, Ina Meier, Katharina Nicolay, Maria Theresia Evers, Melanie Köstler, Wolfram Scheffler	Published in *Steuer und Wirtschaft*	- Introduction and positioning of the article - Elaboration of the institutional background - Development of the concept of a cash flow-oriented taxation - Comparison of the concept with the discussion draft - Derivation of recommendations for action
4 Transparency in Financial Reporting: Is Country-by-Country Reporting suitable to combat international profit shifting?	Christoph Spengel, Ina Meier, Maria Theresia Evers	Published in *Bulletin for International Taxation*	- Introduction and positioning of the article - Description and analysis of current proposals - Cost-benefit analysis - Identification of alternatives and implications for politics
5 Niedrigverzinsung und Unternehmensbesteuerung	Christoph Spengel, Ina Meier	Published in *Finanz-Rundschau*	- Introduction and positioning of the article - Analysis of the status quo and the various tax (accounting) effects of a low interest environment in Germany - Reform considerations - Implications for politics

2 Effects and Drivers of Book-Tax Differences: Literature Review and Meta-Analysis[6]

2.1 Introduction

The observed increase in differences between book and taxable income (Book-Tax Differences (BTD)) as well as various reporting scandals in the US have triggered an intense discussion on the appropriate degree of Book-Tax Conformity (BTC), i.e. the degree to which book and tax accounting should be aligned. In particular, it is largely unclear to what extent book-tax differences relate to deterministic deviations between financial and tax accounting or rather to "aggressiveness" in either or both book and tax reporting. At the same time, it also remains uncertain whether increased book-tax conformity would actually reduce Earnings Management (EM) and/or Tax Sheltering (TS) and whether book-tax differences are really indicative of such opportunistic reporting behavior. Moreover, the question arises which and how specific firm characteristics drive the book-tax gap.

Over the last decade, a huge body of tax accounting literature covering a broad range of different topics has emerged. These research questions, for instance, refer to the information content of BTD with regard to particular earnings features as well as to BTD as an indicator for opportunistic reporting behavior. With respect to the latter, we have identified two major interrelated strands dealing with the association between BTD/BTC and EM/TS. This topic has been continuously and intensely discussed in public and in the literature and therefore lies in the focus of our study. The first one examines whether BTD actually are indicative of aggressive reporting. In the second strand, BTD are already operationalized as proxies for aggressive reporting (EM and/or TS) and it is analyzed which particular drivers impact on BTD (on EM/TS, respectively).

The empirical evidence on these issues is, however, not unambiguous. While recent evidence provided by Watrin et al. (2014) and Blaylock et al. (2015) for instance find that book-tax conformity is associated with significantly more earnings management, Tang (2015) concludes that high book-tax conformity deters overall earnings management and tax avoidance. In addition, there is great heterogeneity in the proxies for EM and TS and in the measures used to determine BTD and BTC. Measures for EM and TS, for example, include accruals, indicator variables for detected or alleged fraud, or tax contingencies. With respect to BTD, the major challenge in most studies is that actual tax return data is not available. Hence, most studies have

[6] We would like to thank the Stiegler Stiftung for financing a research visit at the University of Chicago Law School.

to rely on proxies such as the total difference between book and estimated taxable income while others use more specific measures targeted at capturing EM/TS more precisely or even refer to observed BTD upon tax return data availability.

Against this background, our analysis pursues multiple objectives: First, we intend to provide a comprehensive and systematic literature review covering the two strands outlined above. More precisely, we categorize and discuss the various BTD and BTC measures as well as the different proxies for EM and TS. Furthermore, we identify and examine the possible factors impacting on BTD. Second, beyond this qualitative literature survey, heterogeneity in measures used as well as in reported findings induces us to use quantitative review techniques (meta-analysis) to substantiate our analysis. The major goals of meta-analysis are to identify the determinants of why empirical findings on certain questions significantly vary or are even contradictory and to provide more general conclusions based on a quantitative synthesis of prior findings.

In relation to the first strand on the association between BTD and EM/TS, we employ meta regression analysis (MRA) as an innovative tool in the empirical accounting literature (Pomeroy and Thornton (2008)) to derive a consensus estimate in terms of the sign and statistical significance level, on the association between BTD/BTC and EM/TS. Our MRA additionally serves the purpose of identifying the systematic causes for the substantial heterogeneity in the results of primary studies.

For the second field of literature, we aim at deriving insights on the direction and significance of the major drivers of BTD. As we are not interested in one single statistical association, but in the impact of various factors, we rely on the Stouffer combined test (Hay et al. (2006)) as methodological tool.

The paper continues as follows: Chapter 2.2 sketches the book-tax conformity discussion and explains the various BTD/BTC measures applied in previous studies. A comprehensive literature review on the two identified strands is conducted in chapter 2.3. Firstly, we elaborate on the association between BTD/BTC and opportunistic reporting in chapter 2.3.2. In particular, we discuss the diverse proxies for EM/TS. Secondly, an overview on the most common drivers and components of BTD and how these are expected to be associated with EM/TS is provided in 2.3.3. Chapter 2.4 then explains the techniques of meta-analysis in general and with particular regard to the procedure and methodologies used in our study. Finally, we summarize the results of our quantitative analyses in chapter 2.5 and provide a conclusion in chapter 2.6.

2.2 Institutional Background: Book-Tax Conformity and Book-Tax Differences

Book-tax conformity

There has been a long-standing debate among tax experts and legislators regarding the appropriate degree of book-tax conformity, i.e. the extent to which book and tax accounting should be aligned. This debate was not only triggered by various reporting scandals such as the one involving Enron[7], but also by the observation that the book-tax gap in the US has considerably widened over the last decades (Desai (2003) and Desai (2005); Mills et al. (2002); Plesko (2002); Manzon and Plesko (2002); Hanlon and Shevlin (2005)). Yet, the specific causes driving this divergence are largely unknown (Hanlon and Shevlin (2005), p. 106).

Several arguments have been brought forward by proponents and opponents of increased book-tax conformity.[8] Proponents (Desai (2003) and Desai (2005); Whitaker (2005); Shaviro (2009); Yin (2001)) posit that book-tax conformity would constrain managers' scope and incentives for aggressively reporting on both financial and taxable income as a result of the book-tax trade-off: Overstating financial earnings would entail costs of higher tax payments; understating taxable income would come at the cost of having to report lower earnings to shareholders and other capital market participants. This is in contrast to managers' alleged scope for simultaneously reporting high earnings to capital markets and low taxable income to tax authorities in the framework of low book-tax conformity. Hence, book-tax conformity could constitute an incentive not to report opportunistically in either direction, thereby enhancing earnings quality, tax compliance and transparency. Furthermore, relying on one instead of two sets of accounting rules could potentially reduce compliance and administrative costs.

Opponents (Hanlon et al. (2005); Hanlon and Shevlin (2005); Hanlon et al. (2008); McClelland and Mills (2007)) of increased book-tax conformity, however, emphasize the divergent objectives of both reporting lines. Arguing that an alignment of the two reporting systems would induce managers to report in such a way that taxes are minimized instead of in a way that as much relevant information as possible is conveyed to capital market participants, they claim that book-tax conformity would result in a decrease of accounting information available to the public and, hence, in a decrease of earnings quality (Hanlon et al. (2005); Ali and Hwang (2000); Guenther and Young (2000); Hanlon et al. (2008)).

7 For details on the Enron case, see McGill and Outslay (2002).

8 For an extensive discussion on the pros and cons of book-tax conformity, see for instance Hanlon and Maydew (2009); McClelland and Mills (2007).

Sources of book-tax differences

Generally speaking, differences between book and taxable income (book-tax differences)[9] are assumed to be determined by two major drivers: First, book income and taxable income are both computed on an accrual basis, but are intended to serve different purposes (Hanlon and Shevlin (2005); Hanlon and Heitzman (2010)). While financial accounting under the Generally Accepted Accounting Principles (GAAP) is supposed to provide decision-relevant information, e.g. for capital markets, taxable income determination has to be in accordance with tax law, which has more political objectives and therefore leads to different rules. These objectives are for instance of a fiscal, social or economic nature. As an example, accelerated depreciation provided under tax law is intended to alter corporate behavior in a way that investment activity is increased (Graham et al. (2012b), p. 24).

A second, at least suspected, driver of book-tax differences is "aggressive reporting" for either or both book and tax reporting purposes (Hanlon and Heitzman (2010), p. 130). Indeed, evidence provided so far suggests that large positive book-tax differences are indicative of aggressive financial reporting (e.g. Hanlon (2005); Lev and Nissim (2004)). Likewise, Desai (2003) argues that the increase in book-tax differences throughout the last decades cannot only be explained by traditional drivers of the book-tax gap, but also by increased tax sheltering activity.

Taking a look at book-tax differences resulting from divergent provisions in financial and tax accounting, one can first of all distinguish between differences occurring at the *pre-tax* vs. at the *after-tax* level (Hanlon and Heitzman (2010)). Differences between *pre-tax* accounting earnings and taxable income can be either of permanent or temporary nature. Permanent BTD arise when one measure of income requires an item to be included for its computation while the other measure does not (Hanlon and Shevlin (2005), p. 105).[10] By contrast, temporary BTD emerge because of differences in the rules governing the recognition of income and expense items, but ultimately reverse such that overall equal amounts are deducted or recognized for book and tax purposes.[11] In financial accounting, there additionally exist tax-related accounting accruals that are not present for tax purposes, thus generating further differences between taxable income and *after-tax* book income (Hanlon and Heitzman (2010), p. 170). These items

[9] The following discussion on the sources of book-tax differences focuses on the institutional context of the USA, because the vast majority of empirical studies is based on US data. Many findings can, however, be transferred to other institutional settings, including the German institutional context.

[10] As an example, municipal bond interest is included in book income, but excluded from taxable income.

[11] Examples for these kinds of BTD include depreciation, warranty and bad debt expenses, and deferred revenue, see e.g. Hanlon and Heitzman (2010).

are suspected to be used for earnings management (Hanlon and Heitzman (2010), p. 133) as their determination requires some managerial judgment. In particular, three major income tax-related accounting accruals are discussed in the literature:[12] the valuation allowance, the contingency reserve, and the amount of foreign earnings designated as permanently reinvested. The valuation allowance is a contra-asset account to factor in the effect of tax benefits relating to deferred tax assets that are not expected to be realized in the future.[13] The contingency reserve – also called "tax cushion" – is recognized for uncertain tax positions. Specifically, it is a liability recognized at the estimated amount of taxes that might be additionally due in the future as a result of tax audits.[14] Thirdly, US corporations that operate a foreign subsidiary in a jurisdiction with a lower income tax rate than the US have the opportunity to designate foreign earnings as permanently reinvested, if the firm does not intend to repatriate those subsidiary's earnings in the foreseeable future; thus creating permanent BTD.

Several provisions in financial accounting and tax law require certain disclosures on book-tax differences. For instance, the tax footnotes to the financial statements have to include component-based information on material deferred tax accounts and need to provide for a reconciliation of the statutory federal tax rate with the effective tax rate (Graham et al. (2012b)). Similarly, tax returns entail Schedules M-1 and M-3 for a reconciliation of book and taxable income. However, it has been argued that these disclosures on book-tax differences are insufficient and inappropriate to enable capital market participants or tax authorities to actually draw valid inferences about the size and sources of book-tax differences (e.g. Hanlon (2003); Mills and Plesko (2003); Hanlon and Heitzman (2010)). Arguably, this leaves leeway for companies to engage in opportunistic financial and/or tax reporting.

Different types of BTD

There exist several measures of BTD (see Table 2) that are employed in the empirical tax accounting literature. These measures relate to different kinds of BTD and thus also capture different things. Some BTD measures are specifically constructed so as to capture or to account for aggressiveness in financial and/or tax reporting; other measures are defined more broadly and also entail items that are not considered to be used by firms for aggressive reporting. As Hanlon and Heitzman (2010) point out, it is, however, "often not clear why a particular measure

[12] The following remarks on the three income tax accruals are largely based on Graham et al. (2012a) and Graham et al. (2012b).

[13] For instance because no sufficient taxable income is expected.

[14] Since 2007, the financial reporting standard FIN 48 stipulates the disclosure of the tax contingency balance in the footnotes to the financial statements. Also see chapter 2.3.2 for more details on the tax contingency.

is used for the research question at hand". In the following, these measures and their rationale are examined in more detail.

Total BTD represent the most comprehensive measure and capture both temporary and permanent BTD. Absent tax return data, they are mostly computed from financial statement information as the difference between pre-tax book income and estimated taxable income. Following Manzon and Plesko (2002), taxable income is mostly approximated by grossing up the current tax expense with the statutory tax rate.[15] Although the Total BTD measure is appealing with regard to its straightforward computation, it has been posited that it is subject to substantial measurement error, given various problems associated with estimating taxable income from financial statements (Hanlon (2003)). These problems are for instance related to different consolidation rules for book and tax purposes, tax credits, foreign operations or loss firms.[16] Only a few studies are based on actual tax return data, i.e. taxable income does not need to be estimated to compute Total BTD in these cases, thus avoiding potential measurement error.[17]

Apart from this basic BTD measure, the empirical literature has come up with some precise BTD proxies that are designed to specifically account for aggressiveness in either or both financial and tax reporting.

[15] A refined approach and more details on the computation are for example provided by Wilson (2009).

[16] For more details, also see Hanlon and Heitzman (2010); Desai and Dharmapala (2006). Moreover, Hanlon and Heitzman (2010) posit that Total BTD also include Permanent BTD that are not related to accounting accruals as well as items that do not really represent BTD. They therefore conclude that Total BTD may not be appropriate to examine "whether information in the tax expense is indicative of earnings management in other pre-tax accruals".

[17] However, using tax return data comes with its own problems, see Hanlon and Heitzman (2010), p. 139.

Table 2: BTD measures used in the empirical tax accounting literature

BTD Measure	Author(s)	Computation	Description
Total BTD	Manzon and Plesko (2002)	$Pretax\ book\ income - ((\frac{current\ tax\ expense}{statutory\ tax\ rate} - (NOL_t - NOL_{t-1}))$	Pretax book income – grossed up tax expense, i.e. the total difference between book and taxable income
Temporary BTD	-	$\frac{Deferred\ tax\ expense}{Statutory\ tax\ rate}$	Temporary BTD
Permanent BTD	-	$Total\ BTD - Temporary\ BTD$	Differences between book and taxable income that do not reverse over time
DTAX	Frank et al. (2009)	Error term from the following regression: $Permanent\ BTD_{it} = \alpha + \beta * Nondiscretionary\ items_{it} + \gamma * other\ statutory\ adjustments_{it} + \varepsilon_{it}$	Discretionary permanent differences Residual from regression of total permanent BTD on non-discretionary items that are known to cause permanent differences as well as on other statutory adjustments
Discretionary Total BTD	Desai and Dharmapala (2006)	Error term from the following regression: $Total\ BTD_{i,t} = \beta * Total\ Accruals_{i,t} + \mu_i + \varepsilon_{i,t}$	Part of Total BTD that can be attributed to tax avoidance and not earnings management; residual from regression of Total BTD on total accruals
BTD with the effect of tax sheltering removed	Wilson (2009)	Total BTD – effect of tax benefits: $Total\ BTD - \frac{tax\ savings}{statutory\ tax\ rate}$	BTD without the effect of tax sheltering; deduction from the Total BTD of the effect, i.e. the tax savings, of tax benefits

Source: Own representation, based on Hanlon and Heitzman (2010).

Temporary BTD emerge as a result of differences between book and taxable income with regard to the timing of accrual income and expense items. They can be measured by grossing up the deferred tax expense with the statutory tax rate (e.g. Moore (2012)). Temporary BTD are considered to entail information about potential management of non-tax accruals such as depreciation (Hanlon and Heitzman (2010), p. 132).[18]

Permanent BTD, constituting the conceptual counterpart to temporary BTD, result from differences between book and taxable income that do not reverse over time. Permanent BTD are usually computed as the difference between estimated Total BTD and Temporary BTD (e.g. Wilson (2009); Lisowsky et al. (2013)). In the literature, it has been brought forward that an "ideal" tax shelter features such Permanent BTD (Plesko (2004); Frank et al. (2009); Shevlin (2002)),[19] as they decrease taxable income and effectively reduce effective tax rates (ETR) without affecting financial income reported to shareholders. Hence, Permanent BTD could be indicative of aggressive tax reporting. Indeed, Wilson (2009) for instance demonstrates that most tax shelters generate Permanent BTD. However, Hanlon and Heitzman (2010) claim the notion of Permanent BTD being more indicative of tax aggressiveness than Temporary BTD overall to be "unsupported" by empirical evidence.

A frequently used measure is the **Discretionary permanent BTD (DTAX)** measure developed by Frank et al. (2009). Targeted at quantifying "discretionary permanent differences", it is considered as a measure of tax reporting aggressiveness. Frank et al. (2009) base their proxy on permanent BTD (rather than total BTD) also arguing that anecdotal evidence suggests aggressive tax shelter activity to be rather associated with permanent BTD. In doing so, they justify excluding tax planning related to temporary differences.[20] Furthermore, they contend that permanent BTD "reflect items that are not considered aggressive tax reporting", such as changes in the tax cushion, changes in the valuation allowance, goodwill and other intangible assets or tax credits. Therefore, DTAX is estimated by regressing total permanent BTD on these non-discretionary items that are known to cause permanent differences as well as on other

[18] Other non-tax accruals include e.g. the warranty and bad debt expense.

[19] As an example for the German institutional context, internally generated intangible assets must not be recognized in tax balance sheets, but recognition in single financial accounts is optional. Hence, in case these assets are recognized in single financial statements, income is increased without raising taxable income, see Watrin et al. (2014), p. 66.

[20] Furthermore, Frank et al. (2009) argue that temporary differences also reflect earnings management via pre-tax accruals (also see Phillips et al. (2003) and Hanlon (2005) on this). As their study also examines how tax aggressiveness relates to pre-tax earnings management, they posit that they avoid spurious correlation between temporary BTD and pre-tax earnings management (and thus: spurious correlation between earnings management and tax aggressiveness) by excluding those temporary BTD from DTAX. Frank et al. contend that avoiding this kind of spurious correlation outweighs the costs of excluding tax planning associated with temporary BTD.

statutory adjustments[21] that are likely unrelated to tax aggressiveness. Specifically, discretionary permanent differences (DTAX) are the residual from this regression. This residual is supposed to capture intentional tax aggressiveness, after determinants that are not related to tax aggressiveness have been removed. Conceptually, this discretionary measure intends to cover items that decrease the firm's ETR, i.e. items that reduce taxable income and increase accounting earnings (Hanlon and Heitzman (2010), p. 142).[22] According to Frank et al. (2009), this kind of captured tax planning could or could not be considered fraudulent tax evasion (Frank et al. (2009), p. 468).

Similarly, **Desai and Dharmapala's (2006) Discretionary Total BTD** measure constitutes a discretionary measure of tax reporting aggressiveness. More precisely, this proxy elicits that part of Total BTD which can be attributed to tax avoidance and not earnings management; i.e. it determines an abnormal BTD after the impact of total accruals is removed. Specifically, Desai and Dharmapala (2006) proceed as follows: First, they estimate Total BTD according to the methodology of Manzon and Plesko (2002). Then, Total BTD are regressed on total accruals intended to capture earnings management. The residual from this regression, i.e. the component of Total BTD that cannot be explained by variations in total accruals, is determined to be a measure of tax avoidance activity. The Discretionary Total BTD measure is also widely used in the literature.[23]

Finally, Wilson (2009) adopts quite a different approach to estimate a **BTD with the effect of tax sheltering removed**. His approach is based on a sample of firms that were accused of having engaged in a tax shelter by the Treasury or by the Press. In particular, Wilson deducts from the Total BTD the effect, i.e. the tax savings, of tax benefits using information from the footnotes to the financial statements. To this end, he grosses up the identified federal tax savings by the applicable statutory corporate income tax rate and deducts it from the firms' Total BTD to obtain this revised BTD estimate. Ultimately, his approach aims at comparing BTD of tax shelter firms to those of non-shelter firms.[24]

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[21] Frank et al. (2009) name state taxes as an example for such statutory adjustments.

[22] Hanlon and Heitzman (2010) argue, however, that Frank et al.'s (2009) terminology for permanent BTD is "somewhat unfortunate", contending that it captures more than permanent BTD.

[23] Based on Desai and Dharmapala's (2006) approach, Kraft (2015) constructs another measure of Discretionary BTD, which is intended to capture both earnings management and tax avoidance. To that end, Kraft partitions total accruals into normal accruals and discretionary accruals using the model of Dechow et al. (2003). She then regresses Total BTD on normal accruals, arguing that the residual from this regression reflects Discretionary BTD that comprise earnings management and tax avoidance. Kraft's measure has not, however, been used in other studies yet.

[24] Indeed, Wilson (2009) finds that BTDs are no longer significantly different from those of the non-shelter control firms when tax savings generated by tax shelters are taken into account.

BTC measures

Book-tax conformity pertains to the degree to which book and tax accounting are aligned and thus also to the extent to which there is room for book-tax differences to occur. The effects of BTC, for instance with regard to earnings management and tax sheltering, have mostly been studied by means of cross-country studies aimed at capturing differing levels of BTC across various countries. This follows the rationale that the amount of flexibility that firms have to report BTD varies across jurisdictions (Atwood et al. (2012), p. 1834). Early studies on book-tax conformity (Alford et al. (1993); Hung (2001); Ali and Hwang (2000); Guenther and Young (2000); Leuz et al. (2003); Burgstahler et al. (2006)) simply categorize the contemplated countries as having either high or low conformity. This categorization is derived from law, representing the perceived extent to which accounting provisions of the tax law conform to financial accounting standards (Watrin et al. (2014), p. 56). Hence, this measure is rather subjective and not of an empirical nature (Tang (2015), p. 443).

In contrast to that, Atwood et al. (2010) develop a comprehensive measure of the required level of BTC in a given country. They define BTC as "the flexibility that a firm has to report taxable income (TI) that is different from pre-tax book income (PTBI)" and base their measure on the conditional variance of current tax expense (CTE) (as of consolidated financial statements) for a given level of pre-tax book income.[25] In particular, they rely on the root mean-squared error (RMSE) from a country-year regression of CTE on PTBI as it provides an unbiased estimate of the standard error of the regression. Consequently, countries featuring a lower RMSE are assumed to have less flexibility in tax reporting and in employing strategies that generate BTD, and thus, face higher BTC. In fact, countries are ranked according to their RMSE such that countries with higher rankings in a given year feature a higher BTC.[26]

While Atwood et al.'s measure is based on data from consolidated financial statements, Watrin et al. (2014) develop a BTC measure that is based on the relation between single financial statements and tax accounts. They substantiate their approach arguing that in most European high conformity countries taxable income determination is related to single financial statements. Watrin et al.'s (2014) measure is based on permanent BTD, computed at the single entity level and aggregated at the country level. Specifically, per country and year, they compute the mean of all the absolute values of permanent BTD. Thereafter, they assign a rank

[25] Given that Atwood et al. (2010) examine the association between CTE and PTBI, their measure is most likely closest related to Total BTD.

[26] Atwood et al. (2010) use descending ranks, i.e. the highest RMSE is assigned a value of zero, and the lowest RMSE is ranked n-1, with n being the number of countries included in a given year. These rankings are divided by n-1 thereafter to scale these to be between zero and one.

to each country in each year based on the mean permanent BTD such that countries with higher rankings exhibit higher BTC.[27] Obviously, the larger the BTD, the lower is the level of book-tax conformity.

Finally, another empirical proxy for mandated book-tax conformity was developed by Tang (2015). Precisely, Tang (2015) defines required BTC as the amount of variation in temporary and permanent BTD "that cannot be explained by opportunistic book and tax reporting for firms in a given country and year". To determine mandated BTD, Tang (2015) first of all aims at disentangling BTD relating to legal differences between financial and tax accounting from BTD relating to opportunistic book and tax reporting. To that end, she regresses BTD on a proxy for earnings management (discretionary accruals) and on a proxy for tax avoidance (the difference between the statutory tax rate and the effective tax rate) and their interaction term. Tang (2015) then uses the root-mean-squared errors from this regression as a measure of the degree to which book and tax income deviate due to rule differences, thus reflecting a country's level of mandatory conformity.

BTD: Measured vs. approximated

Computing BTD obviously requires an estimate of taxable income. Taxable income is reported on tax returns and financial statements include information on the tax expense as well as on tax assets and liabilities, such as deferred taxes. Theoretically, estimates of taxable income could therefore be derived from both tax returns and financial statements. However, tax returns are usually not publicly accessible and thus only a few empirical investigations are based on such actual tax return data.[28] In the absence of tax return data, most studies rely on proxies for tax positions estimated from financial statements. For instance, as outlined above, a common approach to approximate taxable income is to gross up the current tax expense on the income statement by the statutory tax rate. However, deriving estimates of taxable income from financial statements comes along with various problems. Hanlon (2003) and McGill and Outslay (2004) extensively discuss these issues: Essentially, tax disclosures in financial statements are insufficient to draw valid conclusions about taxable income and actual taxes paid in a given fiscal year (Hanlon and Heitzman (2010), p. 139), i.e. additional disclosures would be necessary to enable these computations. At the same time, however, it is also unclear whether the availability of tax return data would actually be helpful to overcome all of these

[27] Watrin et al. (2014) employ the same descending ranking procedure like Atwood et al. (2010), i.e. they also yield BTC ranks that range between zero and one.

[28] Examples include Lisowsky (2009); Mills (1996); Mills and Newberry (2001); Mills et al. (2002) and Plesko (2007).

measurement errors. In that regard, divergent consolidation rules for book and tax purposes constitute a major problem (Hanlon (2003); Mills and Plesko (2003)). As Hanlon and Heitzman (2010) argue, it is thus very difficult to match tax returns with the associated financial statement(s). Hence, it could often remain unclear how much tax is actually paid on reported accounting earnings (Hanlon and Heitzman (2010), p. 139).

2.3 Overview of previous empirical studies

2.3.1 Introducing the major strands of literature

Despite of the various, well-known arguments in the book-tax conformity debate[29] and a large body of empirical tax accounting literature, there is very heterogeneous and mixed evidence on the actual effects of book-tax conformity and book-tax differences. Empirical assessments conducted so far cover diverse issues, which can broadly be grouped into the following three strands: (1) BTD as a proxy for Tax Sheltering and/or Earnings management; (2) Components/Drivers of BTD; (3) Association between BTD and properties of financial accounting earnings.

One of the still unresolved issues is the question whether book-tax conformity leads to more or to less opportunistic reporting behavior. While recent evidence provided by Watrin et al. (2014) and Blaylock et al. (2015) for instance finds that book-tax conformity is associated with significantly more earnings management, Tang (2015) concludes that high book-tax conformity deters overall earnings management and tax avoidance. Similarly, there exist studies that determine a significant positive association between BTD and opportunistic reporting whereas other papers report no significant or even a significant negative relation. As regards the strand on the drivers of BTD (EM/TS, respectively), there are, for instance, two competing theories on the relationship between firm size and tax planning, and the empirical evidence is mixed as well (Armstrong et al. (2012); Moore (2012); Rego and Wilson (2012); Guenther et al. (1997); Chan et al. (2013)).

Therefore, the aim of our analysis is to provide a systematic literature review of the first strand (see chapter 2.3.2) as well as to derive more general conclusions on the association between BTD/BTC and EM/TS by using quantitative review techniques (see chapter 2.5.1). Furthermore, it is our objective to identify main drivers of heterogeneity in results.

Likewise, as regards the second strand of literature, we intend to contribute by identifying and systematizing the drivers and components of BTD examined in prior studies (see chapter 2.3.3),

[29] See chapter 2.2.

as well as by providing quantitative insights on the overall direction and significance of their impact (see chapter 2.5.2).

The third group of studies deals with the issue of earnings quality, captured for instance by the persistence or value relevance of earnings.[30] We, however, abstain from further examining these studies in our meta-analysis for several reasons: First of all, our analysis is mainly concerned with opportunistic reporting, and earnings quality covers this issue only indirectly. Furthermore, this body of literature is comparably smaller and conceptually so heterogeneous that we concluded that a quantitative analysis would not be meaningful.

2.3.2 Association between BTD and Proxies for Tax Sheltering and/or Earnings Management

According to Desai and Dharmapala (2009), the measured book-tax gap can – apart from deterministic differences between tax and financial accounting – be attributed to either downward managing of taxable income (tax sheltering/avoidance) or over-reporting of financial income (earnings management).[31] There is a great variety of empirical papers which examine precisely this relation and test for a potential association between BTD/BTC and proxies for TS and/or EM.[32] Most of these individual studies estimate models whose specifications roughly resemble the following equation:

$$Y = X\emptyset + \gamma BTD + \vartheta \tag{1}$$

where *Y* is a measure of EM or TS, *X* a vector of control variables including a constant, *BTD* a measure of BTD or BTC, and ϑ an error term.

Table 3 provides an overview of these studies and summarizes the papers with respect to their authors, title, year and journal of publication, sample period, country and size as well as, most importantly, the utilized EM/TS and BTD/BTC measures.

[30] See e.g. Hanlon (2005); Hanlon et al. (2008); Lev and Nissim (2004); Blaylock et al. (2012); Atwood et al. (2010); Tang and Firth (2012). For a more extensive discussion, see chapter 3.2.4.

[31] For more information on that see Desai and Dharmapala (2009), p. 540.

[32] There are, however, only very few studies which examine the effects of BTD on the interplay of earnings management and tax sheltering. For examples see Tang (2015); Frank et al. (2009).

Table 3: Overview of studies with BTD as a proxy for Tax Sheltering and/or Earnings management

Authors	*Title*	*Year*	*Publication*	*Period*	*Country*	*Sample Size*	*Topic*	*Dependent variable*	*BTD or BTC?*	*BTD/BTC measure(s)*
Wilson	An Examination of Corporate Tax Shelter Participants	2009	TAR	1975-2002	U.S.	118	TS	TS indicator	BTD	Total BTD BTD w/o tax shelt. Permanent BTD Temporary BTD
Desai, Dharmapala	Corporate tax avoidance and firm value	2009	REST	1993-2001	U.S.	4,985	TS	TS indicator	BTD	Total BTD
Gallemore, Maydew, Thorncock	The Reputational Costs of Tax Avoidance	2014	CAR	1995-2001	U.S.	84	TS	TS indicator	BTD	Total BTD
Lisowsky	Seeking Shelter: Empirically Modeling Tax Shelters using Financial Statement Information	2010	TAR	2000-2004	U.S.	9,223	TS	TS indicator	BTD	Total BTD DTAX
Lisowksy, Robinson, Schmidt	Do Publicly Disclosed Tax Reserves Tell Us About Privately Disclosed Tax Shelter Activity?	2013	JAR	2006-2009	U.S.	3,262	TS	TS indicator	BTD	Total BTD Permanent BTD DTAX
Mills	Book-Tax Differences and Internal Revenue Service Adjustments	1998	JAR	1982-1992	U.S.	525	TS	Audit adjustments	BTD	Total BTD Temporary BTD
Chen, Gavious, Josef	The Relationship Between the Management of Book Income and Taxable Income Under a Moderate Level of Book-Tax Conformity	2013	JAAF	1994-2007	Israel	313	TS (and EM)	Audit adjustments	BTD	Total BTD
Cho, Wong, Wong	Book-Tax Differences and Inland Revenue Audit Adjustments in New Zealand	2006	JBFA	1991-2000	New Zealand	81	TS	Audit adjustments	BTD	Total BTD Temporary BTD
Mills, Sansing	Strategic Tax and Financial Reporting Decisions: Theory and Evidence	2000	CAR	1982-1992	U.S.	481	TS	Audit adjustments	BTD	Total BTD
Tang	An empirical analysis of book-tax reporting difference and tax noncompliance behavior in China	2005	Thesis	1998-2003	China	1,251	TS	Audit adjustments	BTD	Total BTD
Chan, Lin, Mo	Will a departure from tax-based accounting encourage tax noncompliance? Archival evidence from a transition economy	2010	JAE	1996-2003	China	1,286	TS	Audit adjustments	BTD	Total BTD
Frischmann, Shevlin, Wilson	Economic Consequences of Increasing the Conformity in Accounting for Uncertain Tax Benefits	2008	JAE	2007	U.S.	354	TS	Tax contingencies	BTD	Total BTD
Cazier, Rego, Tian, Wilson	Early Evidence on the Determinants of Unrecognized Tax Benefits	2009	WP	2007	U.S.	566	TS	Tax contingencies	BTD	Total BTD Permanent BTD DTAX

Blouin, Tuna	Tax Contingencies: Cushioning the blow to earnings?	2007	WP	1997-2004	U.S.	6,343	TS (and EM)	Tax contingencies	BTD	Total BTD Temporary BTD
Atwood, Drake, Myers, Myers	Home Country Tax System Characteristics and Corporate Tax Avoidance: International Evidence	2012	TAR	1993-2007	22 countries	69,301	TS	Reduction in taxes paid	BTC	BTC measure Atwood
Kraft	Management Earnings Forecasts and Book-Tax Differences	2015	IJEF	1995-2010	U.S.	16,224	EM	Meeting earnings forecasts	BTD	Total BTD Discretionary BTD DD BTD
Philipps, Pincus, Rego, Wan	Decomposing Changes in Deferred Tax Assets and Liabilities to Isolate Earnings Management Activities	2004	JATA	1994-2000	U.S.	396	EM	Meeting earnings forecasts	BTD	Temporary BTD
Phillips, Pincus, Rego	Earnings Management: New Evidence Based on Deferred Tax Expense	2003	TAR	1994-2000	U.S.	4,139	EM	Meeting earnings forecasts	BTD	Temporary BTD
Badertscher, Phillipps, Pincus, Rego	Earnings Management Strategies and the Trade-Off between Tax Benefits and Detection Risk: To Conform or Not to Conform?	2009	TAR	1997-2002	U.S.	8,099	EM	Financial statement fraud	BTD	Total BTD
Lennox, Lisowsky, Pittmann	Tax Aggressiveness and Accounting Fraud	2013	JAR	1981-2001	U.S.	126,273	EM (and TS)	Financial statement fraud	BTD	Total BTD Permanent BTD DTAX
Ettredge, Sun, Lee, Anandarajan	Is Earnings Fraud Associated with High Deferred Tax and/or Book Minus Tax Levels?	2008	AJPT	1988-2002	U.S.	130	EM	Financial statement fraud	BTD	Temporary BTD Total BTD
Watrin, Pott, Ullmann	The effects of book-tax conformity and tax accounting incentives on financial accounting: evidence from public and private limited companies in Germany	2012	IJAAPE	1993-2004	Germany	1,778	EM	Discretionary accruals	BTD	Total BTD
Burgstahler, Hail, Leuz	The Importance of Reporting Incentives: Earnings Management in European Private and Public Firms	2006	TAR	1997-2003	13 European countries	269	EM	EM indicator Leuz et al.	BTC	Binary indicator
Blaylock, Gaertner, Shevlin	The association between book-tax conformity and earnings management	2015	RAST	1996-2007	34 countries	362	EM	EM indicator Leuz et al. Discretionary accruals	BTC	BTC measure Atwood
Watrin, Ebert, Thomsen	Book-Tax Conformity and Earnings Management: Insights from European One- and Two-Book Systems	2014	JATA	2004-2011	27 European countries	26,708	EM	Discretionary accruals	BTC	Binary Indicator BTC measure Watrin

Tang	Does Book-Tax Conformity Deter Opportunistic Book and Tax reporting? An International Analysis	2015	EAR	1994-2007	32 countries	372	EM and TS	Discretionary accruals Reduction in taxes paid	BTC	BTC measure Tang BTC measure Atwood
Frank, Lynch, Rego	Tax Reporting Aggressiveness and Its Relation to Aggressive Financial Reporting	2009	TAR	1991-2005	U.S.	156 45,235	TS and EM	TS indicator Discretionary accruals	BTD	DTAX Total BTD DD BTD

Please refer to Table A- 1 in the Appendix for journal abbreviations. Sample size indicates the largest number of observations in a respective paper with BTD included as explanatory variable. "EM" signifies Earnings Management; "TS" signifies Tax sheltering. The categorization of the topic is based on our own assessment of the analyzed papers. "DTAX" refers to Discretionary Permanent BTD; "DD BTD" refers to Desai and Dharmapala's (2006) Discretionary BTD measure; "BTD w/o tax shelt." refers to BTD with the effect of tax sheltering removed, for all measures/definitions see chapter 2.2.

Table 3 sub-groups studies according to their dependent variables, i.e. by whether and how EM or TS is measured (see dashed and bold lines). The most common EM and TS variables will be discussed in more detail in the next sections. In the second step, papers are clustered by their independent variables, i.e. their BTD or BTC measure(s).[33] As already pointed out in chapter 2.2, there is substantial diversity in these proxies. While various studies measure the book-tax gap only roughly as Total BTD, others try to capture opportunistic reporting behavior more precisely, e.g. by using DTAX.[34] In addition, several studies not only examine one single measure, but use a set of (BTD) variables (e.g. Wilson (2009); Frank et al. (2009); Cazier et al. (2009); Lennox et al. (2013); Lisowsky et al. (2013)).

Tax Sheltering Measures

To date, there has been no universally accepted definition of tax avoidance or tax aggressiveness (Hanlon and Heitzman (2010), p. 137) and thus no generally valid TS measure. According to Dyreng et al. (2008), tax avoidance is broadly defined as (legal and illegal) strategies to decrease and minimize taxes. Therefore, tax reporting aggressiveness is supposed to reflect a broad range of activities, e.g. transfer pricing arrangements, location of intangible property in low tax locations, utilization of flow-through entities in structured transactions, synthetic lease arrangements and tax shelter transactions (Frank et al. (2009)). For purposes of this study, we determine tax sheltering as any activity, both legal and illegal, aimed at reducing the tax liability in the framework of tax accounting/reporting. Hence, this does not include multinational profit shifting, i.e. the exploitation of international tax rate differentials.

In the assessed studies, four different categories of TS measures can be identified: (1) indicator variable for firms accused of engaging in a tax shelter; (2) (tax) audit adjustments; (3) tax contingencies; (4) reduction in taxes paid.

The first measure, which captures whether a firm is identified as being currently engaged in tax sheltering, is used by six of the papers. This TS proxy is either designed as a binary variable, indicating whether a firm is alleged to have tax shelter activity or not, or a probability measure specifying the likelihood of being a tax shelter firm. In most cases, the analyses are based on a sample constructed by Graham and Tucker (2006) who identified 43 public corporations accused of tax sheltering by searching publicly available court records and press articles

[33] For more information on the single measures, see chapter 2.2.

[34] The BTD measures are only clustered according to the different categories identified in chapter 2.2, i.e. the general constructs they are based on. Special features of the measures, such as ranked tax-to-book- income (see Kraft (2015)); a dummy variable to capture firms whose BTD are in the top/bottom 20th percentile (see Ettredge et al. (2008)) or an indicator variable for 3-year mean of BTD being positive (see Watrin et al. (2012)) are not included in Table 2.

between 1975 and 2000. Several papers extend their sample by identifying further tax sheltering companies via firms' disclosures, the press or Internal Revenue Service (IRS) confidential data. Wilson (2009), for example, uses the Factiva Database to determine eighteen additional corporate tax shelter participants and Gallemore et al. (2014) obtain 61 other observations for the COLI (Corporate-owned life insurance) tax shelter.[35] Lisowsky (2010) and Lisowksy et al. (2013), in contrast, exploit a new expanded data set from the Office of Tax Shelter Analysis (OTSA) established by the IRS.[36] This data captures several categories of identified illegal corporate tax shelters.[37] Finally, the identified tax shelter firms are then compared to a sample of matched control firms to identify systematic differences.

A second group of papers (six studies) uses tax audit adjustments, being a rather direct measure of a firm's tax avoidance determined by the tax authorities in the firm's final tax assessments. This TS proxy is based on the discrepancy between the final taxable income ascertained by the tax authorities and the taxable income previously reported by the firm in the tax return. Chan et al. (2010) additionally distinguish between book-tax conforming audit adjustments, capturing corrections of misstatements arising from violations of both financial and tax reporting regulations, and book-tax difference audit adjustments, measuring violations of tax rules only. Moreover, some papers apply scaled (by beginning total assets (Cho et al. (2006); Mills and Sansing (2000)); by sales revenue (Chan et al. (2010)) or logarithmic (Tang (2005))) audit adjustment variables. Remarkably, all of the authors using this type of TS measure had access to (confidential) data from tax returns and tax audit results received from tax authorities in several countries (e.g. Mills (1998) for US; Chen et al. (2013) for Israel; Cho et al. (2006) for New Zealand; Tang (2015) and Chan et al. (2010) for China).

The third subgroup of studies utilizes tax contingencies as a proxy for tax aggressiveness (one published and two working papers). To be more specific, two papers (Frischmann et al. (2008) and Cazier et al. (2009)) exploit the FIN 48 contingency for unrecognized tax benefits (UTB),[38] whereas Blouin and Tuna (2007) investigate the tax cushion[39] representing loss contingencies as defined in FAS 5.[40] The rationale behind these TS measures is that they constitute uncertain

[35] The COLI shelter involved firms taking out life insurance policies on their rank-and-file employees and then receiving the death benefits if the employee died. The COLI shelter was the subject of unflattering coverage in the media, including the Wall Street Journal, which identified the companies that engaged in COLI alongside pictures of their actual deceased employees. COLI shelters are, therefore, an example of a tax avoidance strategy that many viewed as particularly aggressive and that resulted in adverse scrutiny for firms that engaged in them, see Gallemore et al. (2014), p. 1106.

[36] The OTSA was established to combat the rise of tax shelters in the late 1990s.

[37] Regulations under IRC §6011 require a firm to attach a form to its tax return for each "reportable transaction".

[38] For more information on the provisions and procedure of FIN 48, see Frischmann et al. (2008), p. 2 f.

[39] For more information on the measurement of the tax cushion, see Blouin and Tuna (2007), p. 7.

[40] For more information on the differences between FAS 5 and FIN 48, see Lloyd et al. (2009).

tax positions, i.e. management believes that these tax positions will be most likely challenged if examined by the relevant tax authorities. Therefore, the amount of the tax contingency equals the additional tax liability which firms expect to pay in case they are audited.

The last identified measure of tax avoidance is the reduction in explicit taxes paid (two papers) which can be defined as the difference between a firm's "unmanaged tax amount", captured by e.g. the home-country statutory corporate tax rate times pre-tax earnings, and its "managed tax amount", i.e. its current taxes paid (Atwood et al. (2012)). This difference is intended to reflect how aggressively managers pursue strategies to reduce the total amount of taxes of a firm. Tang (2015), for example, uses an aggregate of two such proxies based on different definitions of the current tax expense variable at country-level.[41]

Earnings Management Measures

Aggressive financial reporting can broadly be defined as upward or downward earnings management that may or may not be within the limits of GAAP (Frank et al. (2009)). Four different categories of measures, which intend to capture precisely such earnings management behavior, have been determined in the outlined papers: (1) meeting earnings forecasts; (2) financial statement fraud; (3) EM indicator variable according to Leuz et al. (2003); (4) discretionary accruals.

There are three studies which use variables for meeting analysts' expectations as EM proxies. Kraft (2015), for example, tries to detect earnings management by quantifying the likelihood of meeting management earnings forecasts via the odds ratio, i.e. the ratio of the probability of meeting management earnings forecasts to the probability of missing these forecasts. Philipps et al. (2003, 2004) adopt an even broader approach. Specifically, the authors intend to reveal earnings management aimed at meeting three earnings targets: (1) to avoid reporting an earnings decline, (2) to avoid reporting a loss, and (3) to avoid failing to meet analysts' earnings forecasts. They employ scaled changes in annual earnings as variable of interest and compare firm-years with zero or slightly positive earnings levels to a control sample of firm-years with slightly negative earnings.

A second subgroup of studies makes use of firms identified of having committed financial statement fraud (3 studies). This proxy represents an extreme case of earnings management and is basically designed as binary variable, capturing whether a firm is engaged in fraudulent

[41] She uses the ratio of current tax expense to operating cash flows to capture both non-conforming and conforming tax avoidance, whereas she exploits the ratio of current tax expense to pretax income in order to identify only non-conforming tax avoidance.

overstatement of earnings, or a probability measure indicating the likelihood that a firm carries out such extreme EM practices. Thus, it is largely comparable to the first outlined TS measure (indicator variable for firms accused of engaging in a tax shelter). Badertscher et al. (2009), for example, exploit a sample of firms obtained from the GAO (General Accounting/Government Accountability Office) report[42] that restated their earnings downward due to accounting irregularities and thus can be presumed to have managed earnings upward beforehand.[43] Lennox et al. (2013) and Ettredge et al. (2008), in contrast, examine Accounting and Auditing Enforcement Releases (AAERs) which outline the results of the Securities and Exchange Commission's (SEC) investigations of alleged violations of GAAP. Precisely, their samples consist of firms being sanctioned for fraud by the SEC in AAERs as well as control groups of matched non-fraud firms.

A third group of studies bases their measures on an EM indicator variable suggested by Leuz et al. (2003) (two papers). This measure consists of four different proxies which are aimed at capturing a variety of earnings management practices: (1) the tendency of firms to avoid a small loss[44] (measured as the ratio of small profits to small losses); (2) the magnitude of total accruals[45] relative to the magnitude of operating cash flows; (3) the smoothness of earnings relative to cash flows[46] (measured as the ratio of the standard deviation of operating income divided by the standard deviation of cash flow from operations) and (4) the correlation of accounting accruals and operating cash flows[47] (measured as the Spearman correlation between changes in total accruals and changes in the cash flow from operations). In order to mitigate potential measurement errors in individual scores, these sub-measures are aggregated into one single EM variable.

In the last subgroup of papers, financial reporting aggressiveness is measured via discretionary accruals (five studies). Using this proxy follows the rationale that higher discretionary accruals

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42 For an example, see GAO (2002).

43 In addition, they differentiate between book-tax conforming EM (activities that also have current taxable consequences) and non-conforming EM (activities that do not affect current taxable income).

44 Burgstahler and Dichev (1997) and Degeorge et al. (1999) find evidence that U.S firms use accounting discretion to avoid reporting small losses.

45 This measure captures overall financial reporting discretion that firms can make use of to mask their underlying economic performance. Earnings are then temporarily inflated due to accrual choices, but cash flows are unaffected.

46 This variable captures the extent to which corporate owners and managers reduce the variability of reported earnings. By doing so, they are able to conceal changes in their firm's economic performance.

47 The rationale behind this proxy is that firms can use accruals to hide bad or to underreport good current performance following shocks to the firm's economic performance. This induces a negative correlation between changes in accruals and shocks to operating cash flows. While a negative correlation is a "natural" result of accrual accounting, a larger magnitude indicates smoothing of reported earnings (Burgstahler et al. (2006)).

indicate higher levels of opportunistic use of leeway in financial accounting, thus capturing both upward and downward earnings management. Most of the studies refer to the methodology developed by Jones (1991) and modified by Dechow et al. (1995). In doing so, they first of all model total accruals as a function of the difference between the change in sales and the change in accounts receivable as well as Property Plant and Equipment (non-discretionary accruals).[48] Thereby, total accruals are most commonly measured as the change in current assets plus the change in short-term debt less the sum of the change in current liabilities, the changes in cash and depreciation and amortization expenses.[49] Discretionary accruals are then defined as the residual of the outlined model, i.e. the difference between total and non-discretionary accruals. Watrin et al. (2012, 2014) use, in addition to the magnitude of discretionary accruals, an indicator variable for negative values of discretionary accruals. Moreover, Tang (2015) substantiates her analysis by providing two further variations of discretionary accruals, i.e. discretionary revenue as well as discretionary current accruals, and also constructs an aggregate measure.[50]

2.3.3 Components of BTD

While in the previously presented strand of literature BTD are examined as an independent variable to identify a possible association with EM/TS, a multitude of empirical studies use BTD measures as a dependent variable, thus exploring the specific drivers and determinants of BTD. While some studies are primarily targeted at detecting the factors driving the reporting gap[51], the majority of studies[52] employ BTD as a proxy for either or both tax sheltering and earnings management. In doing so, they assess how specific variables of interest as well as diverse control variables are associated with BTD as a measure of opportunistic reporting behavior. Hence, these analyses usually feature a regression equation of the following kind:

$$BTD = \alpha * major\ variable + \beta * controls + \varepsilon \tag{2}$$

The scope of these major variables of interest is quite broad and heterogeneous, i.e. there are various different issues these variables are targeted at. Broadly, these issues and their

[48] All variables are scaled by total assets. For the exact formula, see Frank et al. (2009), p. 479 f.
[49] For the formula, see Watrin et al. (2012), p. 285. Frank et al. (2009), by contrast, compute total accruals differently according to Hribar and Collins (2002), see Frank et al. (2009), p. 479 f.
[50] For more information on these variables, see Tang (2015), p. 449 f.
[51] Out of the 34 studies considered here, 5 studies investigate factors driving book-tax differences.
[52] Out of the 34 studies considered here, 17 studies explore the drivers of tax aggressiveness; 4 studies explore the drivers of earnings management; and 13 studies address both tax aggressiveness and earnings management.

association with tax aggressiveness and/or earnings management can be categorized as follows[53]:

- Management incentives;
- Ownership structure;
- Auditor characteristics;
- Association between tax and financial reporting aggressiveness;
- Others.

Table 4 provides an overview of the specific variables[54] used for each topical category to give an impression of the range of research questions covered by this strand of literature.

[53] This categorization does not include the five studies examining the drivers of BTD without a specific major variable of interest.

[54] Some variables are aggregated, i.e. the list of variables is non-exhaustive.

Table 4: Categorization of major variables of interest

Topic	# studies	Variables
Management incentives	3	• Total compensation of CEO/of the Tax Director • Compensation mix of CEO/of the Tax Director • Value of stock option grants to executives as a fraction of total compensation (and 4 similar others) • Equity risk incentives
Ownership structure	9	• Dummy: firm is private equity (PE) backed • Dummy: firm has majority PE ownership • Dummy: firm is owned by a large PE • Dummy: firm is management owned • Ratio of stock owned by executives • Dummy: firm is a family firm • Percentage of firm's stock owned by (long-term/short-term) institutional shareholders • Difference between voting rights and cash flow rights of a firm's insider • Dummy: firm is publicly traded
Audit characteristics	2	• Measure of auditors' industry expertise • Log of audit fees paid to incumbent auditors
Association between tax and financial reporting aggressiveness	8	*Earnings management* • Total accruals • Discretionary accruals • Real earnings management • Changes in accounting methods • Dummy: consolidated entity has rights issuing or public offering in the next year • Dummy: consolidated entity has loss in current year *Tax aggressiveness* • Firm's depreciation • Dummy: firm practices reinvestment of foreign earnings • Effective tax rate (ETR) • Applicable tax rate • Number of different applicable tax rates in a consolidated group
Others	7	• Unionization rate at firm level • Dummy: male to female CFO transition • Dummy: firm lobbied Congress for tax purposes • Sum of all engagement in CSR activities that negatively affect the firm's stakeholders • Dummy: firm engages in high level of irresponsible CSR activity • Analyst coverage (# analysts following firm) • Rank "harm to reputation" as important • Dummy: firm's tax rate increases in year t+1 • Dummy: firm's tax rate decreases in year t+1

However, the focus of this literature review is not on these very specific variables, but instead on elaborating on those variables that are most commonly used as control variables in the studies.

First of all, Table 5 entails the 34 studies assessed in this investigation. For each study, it lists author, title, year of publication, journal, sample period and country, the overall topic,[55] the category of the major variable of interest[56] and the different BTD measures included.

[55] The overall topic can be Earnings Management (EM), Tax sheltering (TS) or both, EM and TS. All categorizations are based on our own assessment of the analyzed papers.

[56] This is either one of the categories named in Table 3 or – if there is no specific major variable of interest – the drivers of BTD in general.

Table 5: Overview of separate studies with BTD measures as dependent variable included in this review

Authors	*Title*	*Year*	*Publication*	*Period*	*Country*	*Sample size*	*Topic*	*Major variable of interest*	*BTD measure(s)*
Armstrong, Blouin, Larcker	The incentives for tax planning	2012	JAE	2002-2006	U.S.	985	TS	Management incentives	Total BTD DTAX
Badertscher, Katz, Rego	The Impact of Private Equity Ownership on Portfolio Firms' Corporate Tax Planning	2010	WP	1978-2005	U.S.	2,115	TS	Ownership structure	Total BTD DTAX
Badertscher, Katz, Rego	The Separation of Ownership and Control and Corporate Tax Avoidance	2013	JAE	1980-2010	U.S.	2628	TS	Ownership structure	DTAX
Chen, Chen, Cheng, Shevlin	Are family firms more tax aggressive than non-family firms?	2010	JFE	1996-2000	U.S.	3,130	TS	Ownership structure	Total BTD DD
Chen, Gavious, Yosef	The Relationship Between the Management of Book Income and Taxable Income Under a Moderate Level of Book-Tax Conformity	2013	JAAF	1994-2007	Israel	313	EM and TS	Association Tax and Financial Reporting Aggressiveness	Total BTD
Chen, Lin	Does Information Asymmetry Affect Corporate Tax Aggressiveness?	2015	WP	1999-2011	U.S.	23,475	TS	Other (Analyst coverage)	Total BTD DD DTAX
Choi, Lee, Jun	The Provision of Tax Services by Incumbent Auditors and Earnings Management: Evidence from Korea	2009	JIFMA	2000-2006	Korea	6,099	EM	Audit characteristics	Total BTD DD
Chyz, Leung, Li, Rui	Labor unions and tax aggressiveness	2013	JFE	1983-2002	U.S.	1,380	TS	Other (Unionization)	Total BTD DD
Desai, Dhamarpala	Corporate Tax Avoidance and high powered incentives	2006	JFE	1993-2001	U.S.	4,702	TS	Management incentives	DD
Dhaliwal, Lee, Pincus	Book-Tax Differences, Uncertainty about Information Quality, and Cost of Capital	2009	WP	1982-2006	U.S.	75,315	EM and TS	Drivers of BTD	Total BTD
Dridi, Boubaker	The Difference between the Accounting Result and Taxable Income in Detecting Earnings Management and Tax Management: The Tunisian Case	2015	IJBM	2003-2012	Tunisia	210	EM and TS	Association Tax and Financial Reporting Aggressiveness	DD

Francis, Hasan, Wu, Yan	Are female CFOs less tax aggressive? Evidence from tax aggressiveness	2014	JATA	1988-2007	U.S.	343	TS	Other (Gender)	DTAX Total BTD
Frank, Lynch, Rego	Tax Reporting Aggressiveness and Its Relation to Aggressive Financial Reporting	2009	TAR	1991-2005	U.S.	45,235	EM and TS	Association Tax and Financial Reporting Aggressiveness	DTAX Total BTD
Graham, Hanlon, Shevlin, Shroff	Incentives for Tax Planning and Avoidance: Evidence from the Field	2014	TAR	2007	U.S.	141	TS	Other (Reputational concerns)	DTAX
Heltzer	Conservatism and BTD	2009	JAAF	1994-2003	U.S.	35,667	EM	Association Tax and Financial Reporting Aggressiveness	Total BTD
Heltzer, Mindak, Shelton	The relation between aggressive financial reporting and aggressive tax reporting: Evidence from ex-Arthur Andersen clients	2012	RAR	1996-2000	U.S.	460	EM and TS	Association Tax and Financial Reporting Aggressiveness	DTAX
Hill, Kubick, Lockhart, Wan	The effectiveness and valuation of political tax minimization	2013	JBF	1999-2009	U.S.	12,222	TS	Other (Lobbying for Tax)	Total BTD DTAX
Hoi, Wu, Zhang	Is Corporate Social Responsibility (CSR) Associated with Tax Avoidance?	2013	TAR	2003-2009	U.S.	6,393	TS	Other (CSR activities)	DTAX DD
Khurana and Moser	Institutional Ownership and Tax Aggressiveness	2009	WP	1995-2008	U.S.	19,029	TS	Ownership structure	Permanent BTD
Khurana and Moser	Institutional Shareholders' Investment Horizons and Tax Avoidance	2012	WP	1995-2008	U.S.	17,997	TS	Ownership structure	Total BTD Permanent BTD
Koubaa and Anis	Book-Tax Differences: relevant explanatory factors	2015	IJAES	2005-2012	Tunisia	28	EM and TS	Drivers of BTD	Total BTD
Long, Ye, Lv	Non-institutional Determinants of Book-Tax Differences: Evidence from China	2013	JAF	2008-2010	China	3,321	EM	Drivers of BTD	Total BTD
Manzon and Plesko	The relation between financial and tax reporting measures of income	2001	WP	1988-1998	U.S.	3,982	EM and TS	Drivers of BTD	Total BTD
Martani, Anwar, Fitriasari	Book-Tax Gap: Evidence From Indonesia	2011	CUBR	1999-2008	Indonesia	unknown	EM	Drivers of BTD	Total BTD
Martinez, Ramalho	Family Firms and Tax Aggressiveness in Brazil	2014	IBR	2001-2012	Brazil	2,001	TS	Ownership structure	Total BTD
McGuire, Omer, Wang	Tax Avoidance: Do Industry Experts Make a Difference?	2012	TAR	2002-2009	U.S.	8,025	TS	Audit characteristics	Total BTD DTAX

McGuire, Wang, Wilson	Dual Class Ownership and Tax Avoidance	2011	WP	1995-2002	U.S.	638	TS	Ownership structure	DTAX
Mills, Newberry	The Influence of Tax and Nontax Costs on Book-Tax Reporting Differences: Public and Private Firms	2001	JATA	1981-1996	U.S.	4956	EM and TS	Ownership structure	Total BTD
Moore	Empirical evidence on the impact of external monitoring on book–tax differences	2012	AIA	1998-2009	U.S.	7,070	EM and TS	Ownership structure	Total BTD Permanent BTD Temporary BTD
Rego, Wilson	Equity Risk Incentives and Corporate Tax Aggressiveness	2012	JAR	2007-2009	U.S.	18,240	TS	Management incentives	DTAX
Seidman	Investigating the Book-Tax Income Gap: Factors which affect the gap and details regarding ist most significant components	2008	Thesis	1993-2004	U.S.	30,423	EM and TS	Association Tax and Financial Reporting Aggressiveness	Total BTD Temporary BTD Permanent BTD
Seidman	Interpreting the Book-Tax Income Gap as Earnings Management or Tax Sheltering	2010	WP	1993-2004	U.S.	30,460	EM and TS	Association Tax and Financial Reporting Aggressiveness	Total BTD
Tang, Firth	Can Book-Tax Differences Capture Earnings Management and Tax Management?	2011	IJA	1999-2004	China	525	EM and TS	Association Tax and Financial Reporting Aggressiveness	DD
Wong, Lo, Firth	Managing Discretionary Accruals and Book-Tax Differences in Anticipation of Tax Rate Increases: Evidence from China	2015	JIFMA	2001-2006	China	2,628	EM and TS	Other (Tax rate increase)	Total BTD

Please refer to Table A- 1 in the Appendix for journal abbreviations. Sample size indicates the largest number of observations in a respective paper with a BTD measure as dependent variable. “EM” signifies Earnings Management; “TS” signifies Tax sheltering. The categorization of the topic and the major variable of interest are based on our own assessment of the analyzed papers. “DTAX” refers to Discretionary Permanent BTD as described in chapter 2.2. “DD” refers to Desai and Dharmapala’s (2006) Discretionary BTD measure, also see chapter 2.2.

In order to identify the major control variables, we first of all collect all applied variables and assign them to specific categories. Overall, we identify 94 different variables relating to 26 distinct categories. Table 6 gives an overview over all variables and their categorization.

Table 6: Summary of explanatory variables used in studies with BTD measures as dependent variable

Category	*Variable*	*Total number of analyses*	*Expectation:*[57] *Impact on BTD*
Size	Market Capitalization	**32**	**?**
	Total Assets	**37**	**?**
	Sales	1	
	# Employees	4	
Growth	Change in total assets	4	
	Profit growth	3	
	Investment growth	**10**	+
	Change in PPE	2	
	New Investment	3	
	Capital Expenditure	5	
	Sales growth	**22**	+
	Issue dummy (number of shares outstanding increases by more than 10 percent)	2	
Liquidity	Operating Cash Flow	4	
	Dummy: Operating Cash Flow positive	2	
	Change in Cash Flow	3	
	Liquidity (Current Assets/Current Liabilities)	2	
	Cash holding	**9**	-
	Inventory	4	
	Stock turnover	3	
Profitability	ROA/RNOA/ROE	**52**	+
	Profitability dummy	5	
	ROE within certain range	1	
	standard deviation of ROA	5	
Losses	NOL	2	
	Loss Dummy	**8**	-
	NOL Dummy	**46**	-
	Change in NOL	**37**	**?**
	Loss intensity	1	
Leverage	Leverage	**69**	-
Capital intensity	Capital intensity	**9**	+
	PPE	**36**	+
	Net PPE/Gross PPE	1	
	Total assets less PPE and intangibles	1	
	Depreciation and Amortization	4	
Intangibles	Intangibles	**35**	+
	Intangibles less Goodwill	2	
Goodwill	Goodwill	2	
	Change in Goodwill	4	
R&D expense	R&D expense	**18**	+
Advertising	Advertising intensity	1	
	Advertising expense	3	
Market evaluation	P/E Ratio	5	
	Market-to-Book ratio	**35**	+
	Book-to-Market value	5	
	Tobin's Q	3	
	daily average price per year	3	
Analyst coverage	Analyst coverage dummy	3	
	# analysts	3	

[57] Expectations are derived from the predominant expectations expressed in prior studies.

Accruals	Abnormal total accruals	**19**	+
	Pretax discretionary accruals	**8**	+
	Total accruals	4	
	Total accruals dummy	2	
	Lagged BTD	**19**	+
	Average BTD	1	
	DTAX	1	
Equity income in earnings	Equity income in earnings	**36**	+
Foreign operations	Foreign Assets	5	
	Foreign Income/MNC dummy	**13**	?
	Foreign income amount	**34**	?
	Foreign tax credit	2	
Complexity	Geographic complexity	3	
	Industry complexity	3	
Tax and audit characteristics	Big 4 dummy	**8**	?
	Tenure (number of years the current auditor has been auditing the company)	2	
	Dummy: Audit opinion unqualified	2	
	Log of audit fees	2	
	Log of non-audit fees	2	
	Dummy: Audit by second tier auditor	4	
	Audited by Arthur Andersen	1	
	Tax fees	3	
	Proportion tax fees	3	
	Opportunity (market value of client divided by sum of all clients in industry)	4	
CEO/CFO compensation	CFO/CEO-Vega (option value)	4	
	CEO_Slope (pay-for-performance sensitivity)	3	
	CEO Compensation (Level)	3	
	CEO compensation mix	3	
	CEO bonus mix	3	
CEO/CFO characteristics	Dummy: CEO is also chairman	3	
	CEO tenure	3	
Ownership characteristics	Percentage of stock owned by CEO	3	
	Institutional ownership (%)	**11**	?
	Dummy: Firm is listed	2	
	Dummy: Firm is public	2	
	Wedge ratio (difference between controlling shareholders' voting rights and cash flow rights)	2	
	Dummy: more than 30 per cent of ownership is controlled by affiliated firms and controlling shareholders	2	
	Firm holding period	2	
Interest rate	Interest rate (cost of debt)	4	
Distress risk	Distress risk (Probability of bankruptcy)	4	
Retirement benefits	Change in postretirement benefits	2	
CSR	CSR indicator (CSR strengths - CSR weaknesses)	2	
	Positive CSR (Sum of positive CSR engagements)	4	
Others	Corporate Governance Index	1	
	Age of wasting assets	1	
	Dummy: Post-Sarbanes Oxley	2	
	Inverse Mill ratio	9	

Source: Own representation, based on Hay et al. (2006).

A given variable is included in our quantitative analysis if it occurs in more than 5 specifications. These variables are marked in bold print in Table 6. Moreover, for these key

variables, we discuss in the following why and how they are expected to affect BTD, or more specifically, how they are expected to be associated with aggressive tax and/or financial reporting, based on the findings of previous research.

A very commonly used variable is firm **size**, most often captured by a firm's *total assets* or *market capitalization*. In fact, there are two competing theories on the relationship between firm size and tax planning (political power and political cost theory), and the empirical evidence is mixed as well (Armstrong et al. (2012); Moore (2012); Rego and Wilson (2012); Guenther et al. (1997); Chan et al. (2013)). According to political power theory, larger firms have more resources available for manipulating political processes in their favor, dispose of more experience and resources to minimize tax liabilities – for instance by investing in plans that exploit tax-favored assets (Manzon and Plesko (2001)) – and thus overall pay relatively lower taxes than smaller firms (Scholes et al. (1992); Siegfried (1972)). Put differently, larger firms enjoy economies of scale in tax planning (Badertscher et al. (2010)), with these impacting on the marginal costs of tax avoidance (Badertscher et al. (2013)). Moreover, it could be argued that larger firms are better able to mask tax avoidance as a result of firms' complexity (Francis et al. (2014)). According to political cost theory, it could, by contrast, also be contended that large firms face higher political costs. In particular, they are subject to greater public and regulatory scrutiny and are therefore less willing to engage in tax aggressiveness than smaller firms (Manzon and Plesko (2001); Boynton et al. (1992); Watts and Zimmermann (1978); Zimmermann (1983)).[58]

Firm **growth** is another factor considered in numerous empirical studies. It is most often captured by variables such as *investment growth* to account for the impact of a firm's investment activity. The rationale behind this is that growing firms may make more investments in depreciable, tax-favored assets, leading to larger temporary BTD – in particular in economies of high investment (Seidman (2010)) because of differing tax and accounting rules with regard to the recognition of income and expenses (Armstrong et al. (2012); McGuire et al. (2014); Chen et al. (2010); Seidman (2010); Manzon and Plesko (2001); Badertscher et al. (2010)). Apart from accelerated or bonus tax depreciation, investment tax credits may give rise to additional BTD. However, as Manzon and Plesko (2002) argue, this effect may be mitigated by growth firms' frequently occurring tax losses, "rendering tax shields from tax-favored investments less valuable." In addition to that, growth, in particular *sales growth* is regarded as

[58] In addition, it has been brought forward that large companies are more likely to operate multinationally and therefore to have access to alternative, international tax planning and profit shifting channels. This could induce these large companies to focus less on tax sheltering based on discretionary scope in national tax reporting, see Davies et al. (2014).

a proxy for general business conditions and economic circumstances (Tang and Firth (2011); Seidman (2010)). General business conditions in turn influence investment decisions, with the impact of investment described above. Overall, BTD are expected to increase during economic boom times and to decline in times of economic downturn (Seidman (2010)). Moreover, growth opportunities may render firms more complex (Francis et al. (2014)) and volatile (Moore (2012)), for instance in relation to profitability and cash flows, which is also expected to yield a positive association between growth variables and BTD/opportunistic reporting.

Next, **profitability** is considered a major factor impacting on BTD. It can be depicted either by performance indicators such as *return on assets (ROA)* or by variables relating to a firm's losses, such as a *loss dummy*,[59] *Net operating loss (NOL) dummy*,[60] or the *change in NOL carry forwards*. These variables not only proxy for a firm's current profitability and underlying economic activity (Armstrong et al. (2012); Badertscher et al. (2010); Badertscher et al. (2013)), but in particular they capture a firm's need and incentive to engage in tax planning. In that regard, profitable firms face larger incentives for tax planning (Badertscher et al. (2010); Badertscher et al. (2013); Moore (2012)), whereas loss making firms already pay less or no taxes and thus have fewer incentives for tax planning.[61] Moore (2012), however, argues that well performing profitable firms can be assumed to be less volatile, thus giving rise to a possibly negative association between profitability and BTD.

As regards the presence of NOL carry forwards, two competing theories with regard to the impact on BTD can be found in the literature: As they cannot benefit from tax deductions, it could hold that firms having NOL carry forwards may even avoid tax-favored positions to defer tax deductions to future periods, resulting in a possibly negative relation between BTD and NOL carry forwards (Manzon and Plesko (2001)). Manzon and Plesko (2001), however, contend that firms having NOL carry forwards may be those that have taken tax-advantaged positions. Arguing that such firms with NOL carry forwards based on opportunistic tax reporting may find it costly to unwind these positions, a positive association between the existence of NOL carry forwards and BTD may emerge. In addition, from an earnings management perspective, Manzon and Plesko (2001) argue that firms with NOL carry forwards "may find it less expensive to recognize additional (discretionary) income" (Manzon and Plesko

[59] Dummy variable indicating the existence of a loss in a particular fiscal year.
[60] Dummy variable indicating the existence of a net operating loss carry forward.
[61] Indeed, prior evidence suggests that profitable firms feature higher levels of BTD, see Khurana and Moser (2009).

(2001), p. 19), thus increasing the amount of income disclosed to shareholders without increasing tax payments and thus further increasing BTD.

Controlling for changes in NOL carry forwards also follows the rationale that these influence BTD by way of their effect on deferred taxes and/or the valuation allowance (Moore (2012); Frank et al. (2009)). Indeed, Frank et al. (2009) posit that changes in NOL carry forwards have been documented to be "often associated with changes in the valuation allowance, (…) but are typically unrelated to tax planning". Hence, including loss variables also aims at controlling for mechanical effects relating to tax loss carry forwards (Tang and Firth (2011)). In addition to that, Manzon and Plesko (2001) argue that taxable income is overstated if a NOL carry forward arises, as "the current tax benefit generated will not reflect the future tax benefits from the loss carryover" (Manzon and Plesko (2001), p. 22). Thus, an increase in loss carry forwards causes BTD to be underestimated, i.e. the association between the change in NOL carry forwards and BTD would be assumed to be negative.

In a similar vein, **liquidity**, often controlled for by firms' *cash holdings* (Hoi et al. (2013)), is included in studies to take into account firms' cash needs that may require engagement in specific kinds of tax avoidance (McGuire et al. (2012)).[62] Specifically, we would rather expect low liquidity to induce tax avoidance activities aimed at enhancing liquidity.

Studies on BTD include **leverage** to account for the tax benefits, i.e. the tax shields, of debt financing. It has been argued that firms with higher leverage have a lower need for incremental tax planning, as they already benefit from tax debt shields (Armstrong et al. (2012); Badertscher et al. (2010); Badertscher et al. (2013)). Indeed, some prior evidence demonstrates that firms with higher debt tax shields feature smaller BTD (Khurana and Moser (2009)) and that firms accused of having engaged in tax shelters rely on less leverage (Rego and Wilson (2012); Graham and Tucker (2006)). However, the overall evidence on the association between BTD and leverage is somewhat mixed (Moore (2012)). One potential explanation for this could be that the effect of earnings management might work in the opposite direction. In that regard, it has been brought forward that leverage is also intended to capture the effect of default risk on the likelihood of earnings management (Choi et al. (2009)), with that probability increasing as leverage increases. In particular, such earnings management practices could be targeted at avoiding the costly violation of debt covenants, i.e. to loosen their debt constraints, managers

[62] McGuire et al. (2012) name deferral strategies as an example of tax avoidance targeted at enhancing firms' liquidity.

could decide for income-increasing accounting practices (DeFond and Jiambalvo (1994); Watts and Zimmerman (1986); Koubaa and Anis (2015)).

Controlling for firms' **capital intensity**, predominantly proxied by the level of *Property, Plant and Equipment (PPE)* or the level of PPE, inventories and intangible assets combined, strongly relates to the previously discussed investment growth variable. Hence, capital intensity is first of all intended to control for the influence of differences between financial and tax accounting with regard to depreciation, amortization and costs of goods sold (Moore (2012); Mills and Newberry (2001); Chen et al. (2010); Khurana and Moser (2009)). Firms with more capital assets have more opportunities to use these differences, giving rise to higher non-debt tax shields (Khurana and Moser (2009)).[63] Therefore, capital intensity not only controls for mechanical differences between financial and tax accounting, but it also captures tax aggressiveness. Differences relating to depreciation and amortization are particularly pronounced at the beginning of an asset's useful life and reverse over time. Thus, BTD can be expected to be positively related to the extent that a firm uses young assets, which as well is approximated by *PPE* in some investigations (Manzon and Plesko (2001)).

Intangibles are also often considered separately to specifically control for differential book and tax treatment relating to goodwill and other intangible assets (Badertscher et al. (2010); Chen et al. (2010)). These differences between book and tax not only create temporary BTD, but frequently also give rise to permanent BTD (Frank et al. (2009)), thus yielding lower effective tax rates (Badertscher et al. (2013)).

Factoring in **Research & Development (R&D) expenses** is primarily related to prior studies' finding that corporate tax avoidance is systematically associated with R&D expenditures (Rego and Wilson (2012)). R&D expenses may also be considered as a proxy for firm complexity and growth opportunities, which have likewise been suggested to be associated with tax planning (McGuire et al. (2014); Hill et al. (2013)).

Market evaluation variables are considered to account for the potential influence of capital market participants and their assessment of firm value. Very frequently, the *market-to-book* ratio is included in studies as a control for the market's evaluation of the firm's growth prospects (Chen et al. (2010); Hill et al. (2013); Choi et al. (2009)). As such, this variable also captures

[63] Furthermore, Mills and Newberry (2001) argue that capital intensity also constitutes a partial control for the potential influence of the investment opportunity set, thereby referring to Skinner (1993) who finds that firms with higher capital intensity have larger incentives to enforce income-increasing accounting procedures.

the impact of investment activities relating to differing tax and accounting rules on the recognition of income and expenses.[64]

Accruals measures are included in numerous studies examining tax aggressiveness to control for a potential impact of or an association with earnings management behavior. Controlling for earnings quality and earnings management follows the rationale that prior studies find a strong positive relation between financial and tax reporting aggressiveness (Frank et al. (2009); Badertscher et al. (2010); Hoi et al. (2013)). Both *abnormal total accruals* as well as *discretionary accruals*[65] have been used as proxies for earnings management (Chen et al. (2013); Seidman (2008)), which obviously affects BTD by affecting book income (Seidman (2010)). In addition, *lagged BTD* are frequently considered to control for BTD that persist over time (Chen et al. (2010); Chyz et al. (2013); Frank et al. (2009)). In particular, this is targeted at nondiscretionary permanent BTD (e.g. municipal bond interest) which are not supposed to reflect tax aggressiveness (Frank et al. (2009)).

Another item that often generates differences between book and taxable income is **equity income in earnings** (Badertscher et al. (2010); Badertscher et al. (2013)). Precisely, book and tax accounting differ with regard to the treatment of consolidated earnings accounted for using the equity method. The *equity income in earnings* variable is intended to control for this differential treatment (Chen et al. (2013); McGuire et al. (2014); Frank et al. (2009)).

Foreign operations are frequently accounted for in the light of Multinationals' (MNE/MNC) international tax planning efforts. It is mostly measured by either a *foreign income MNC dummy* indicating the existence of a firm's multinational operations or the *foreign income amount.* Specifically, the purpose of these variables is to control for differences in international tax planning opportunities, as multinational firms with foreign operations can potentially engage in multijurisdictional income shifting (Armstrong et al. (2012); Badertscher et al. (2010); Badertscher et al. (2013)). Indeed, Rego (2003) shows that multinational corporations exhibit lower ETRs. In relation to BTD, however, the evidence on the impact of foreign operations is mixed (Moore (2012)). Arguably, firms engaging in tax avoidance based on international profit shifting may tend to engage less in tax avoidance based on differences between financial and tax accounting, and thus, tax avoidance that gives rise to BTD. Technically, BTD relating to foreign operations may also emerge due to the possibility of designating foreign earnings as permanently reinvested for tax purposes (Mills and Newberry (2001); Manzon and Plesko

[64] See discussion on growth variables above.
[65] A more extensive discussion on the diverse measures for earnings management is provided in chapter 2.3.2.

(2001)).[66] Finally, foreign operations may constitute a proxy for complexity (Moore (2012); McGuire et al. (2014); Dhaliwal et al. (2009)) and thus – in line with prior research – be associated with higher levels of BTD.

Another factor suspected to drive BTD is **tax and audit firm characteristics.** The most frequently examined issue is whether or not audit services are provided by a *Big 4* firm. Big 4 auditors are considered to be service providers of higher quality and expertise, and overall expertise is generally associated with higher levels of tax avoidance (McGuire et al. (2012); Choi et al. (2009)). In particular, Big 4 firms' expertise in both tax and audit services could lead to tax strategies that are beneficial from both a tax and financial reporting perspective. Moreover, Big 4 firms may have more resources to justify their tax reports to tax authorities (Chen et al. (2013)). However, the impact of audit characteristics on tax avoidance is not entirely clear. It could also hold that Big 4 firms restrain from aggressive reporting practices to reduce litigation risk and to prevent brand name damage (Chen et al. (2013)). Moreover, the impact of audit firm characteristics may also depend on a country's level of book-tax conformity. In that regard, Van Tendeloo and Vanstraelen (2008) demonstrate that differences in service quality between Big 4 and non-Big 4 auditors only exist in countries with a high level of BTC.

Finally, specific **ownership characteristics** are frequently examined as BTD driver. In particular, various studies assess firms' *institutional ownership*. This variable basically pertains to the ability to monitor managers and thus to enforce corporate governance (Desai and Dhamarpala (2009); Hill et al. (2013); Hoi et al. (2013)). Institutional owners are considered to have a strong incentive and ability to monitor managers (Moore (2012); Khurana and Moser (2009, 2012)), and enhanced corporate governance in turn is likely to affect BTD (Moore (2012)). More precisely, institutional investors may be able to monitor tax risks of corporations and prevent managers from self-serving, opportunistic behavior. Thus, institutional ownership could be assumed to have a negative impact on tax avoidance and BTD (Moore (2012)). Yet, the empirical evidence on the effectiveness of institutional owners in terms of manager monitoring is mixed (Khurana and Moser (2009)). Moreover, accepting the notion that tax avoidance increases firm value, institutional investors could also be in favor of tax avoidance (Khurana and Moser (2012)). Overall, the effect of institutional ownership on BTD is therefore not unambiguous.

[66] Also see chapter 2.2.

2.4 Meta-Analysis

2.4.1 Purpose of Meta-Analysis and Meta-Studies in Accounting

Meta-analysis, in general, refers to a set of statistical techniques and quantitative review methods used to standardize and synthesize findings across empirical studies (Greenberg (1992)). According to Lipsey and Wilson (2001), a properly executed meta-analysis can make significant contributions to practice and policy by developing a general knowledge of the whole body of research in a given topic. One major goal of a meta-analysis is to identify the determinants due to which empirical findings on certain questions significantly vary or are even contradictory. An additional advantage compared to narrative literature reviews is that a meta-analysis can aggregate data from a large number of coherent studies, thereby increasing sample sizes and statistical power and identifying mean relations (with regard to sign and strength) among key variables (Pomeroy and Thornton (2008), p. 308). In the case of heterogeneous findings, specific moderators might account for the variation in correlations across studies (Hunter and Schmidt (2004)).[67] In order to detect their impact, effect sizes measuring the magnitude of the relationship between the dependent variable and a specific independent variable reported in primary literature are, in principle, regressed on a set of moderator variables which quantify differences in method, design and data used (Feld et al. (2013)).

While several meta-studies have emerged in tax research, e.g. on the influence of taxation on Foreign Direct Investments (FDI) or capital structure, over the last years,[68] meta-studies in accounting are still rare.[69] In this regard, Pomeroy and Thornton (2008) identified only 33 existing meta-studies referring to accounting topics or being published in accounting or auditing journals (thereof only 3 in the top-tier journals) compared to 105 meta-studies in Marketing and 233 in Management. That seems to be surprising at first glance as empirical studies in accounting partly produce inconsistent or even contradictory results and meta-analysis techniques generally offer the ideal tool to detect the causes for such deviations and to derive more general conclusions. Furthermore, Greenberg (1992) clearly outlines the advantages of a meta-analysis for accounting topics. While heterogeneity in study outcomes, research designs and variables motivates meta-study analysis, it constitutes a major methodological challenge at the same time. In line with this, severe barriers to meta-studies in accounting and auditing

[67] Using meta-analysis techniques, the variance that is due to inherent differences between different correlations or moderator variables can be distinguished from the variance that is due to statistical artifacts (sampling or measurement error), see Brierly (1999).

[68] For examples, see Feld and Heckemeyer (2011); Feld et al. (2013).

[69] One main focus of the existing meta-studies in accounting lies on the interdependencies between audit committee characteristics and reporting quality.

appear to exist, mainly due to the fact that only few studies are replicated[70] (Borkowski (1996); Chewning and Higgs (2000)). Pomeroy and Thornton (2008) provide three potential explanations for this phenomenon: First, researchers do not seem to be able to agree on single measures, given that these differ from study to study quite substantially. Second, all of these measures apparently still contain methodological limitations and construct validity concerns continuously creating demand for new measures. Third, researcher incentives also provoke diversity and inconsistency in dependent variable selection in order to differentiate their studies from the majority (Burgstahler (1987)). Overall, they conclude that "novel studies, using original measures, are more likely to survive the peer review process than replication studies and studies using the same variables as previous studies" (Pomeroy and Thornton (2008), p. 318).

Existing meta-studies in accounting can basically be divided into two subgroups, either focusing on the association between two specific variables of interest or examining the drivers/determinants of an accounting phenomenon. One example for the first strand of literature is Pomeroy and Thornton (2008) who analyze the association between audit committee independence and financial reporting quality measures.[71] The second group is represented by Hay et al. (2006) and Hay (2013) investigating the most commonly used independent variables in audit fee research.[72] The majority of meta-studies in accounting rely on meta-analysis techniques developed by Hunter and Schmidt (2000, 2004) or Lipsey and Wilson (2001).[73] These are based on the computation of mean (and overall) effect sizes[74], i.e. the magnitude of the relationship between the dependent variable and a specific independent variable of interest, and the conduct of homogeneity analyses (e.g. chi-square tests). In the case of heterogeneity between studies, moderators are detected by sub-grouping studies based on a

[70] Lindsay (1994) surveying the empirical budgeting and control papers in Accounting, Organizations and Society, The Accounting Review and the Journal of Accounting Research from 1970-1987 finds that 84.2% of the papers reject a null hypothesis and virtually none are replication studies. This indicates a potential publication bias in the accounting literature.

[71] Further examples include Ahmed et al. (2013): association between discretionary accruals /analysts' forecast accuracy and IFRS adoption; Derfuss (2009): relationship of budgetary participation/reliance and accounting performance measures; Garcia-Meca and Sanchez-Ballesta (2010): association of board independence/ownership concentration and voluntary disclosure; Habib (2012): association between non-audit service fees and financial reporting quality or Samaha et al. (2015): impact of board and audit committee characteristics on voluntary disclosure.

[72] Further examples are Ahmed and Courtis (1999); Khlif and Souissi (2010); Lin and Hwang (2010).

[73] For more information on the procedures see Hunter and Schmidt (2000, 2004) or Lipsey and Wilson (2001).

[74] The procedures and formulae calculate the population correlation coefficients (e.g. Pearson correlation coefficient) between two constructs using the sample correlations reported in prior empirical research and correct for the statistical artifacts of measurement error and sampling error. For more information on the formula see Lipsey and Wilson (2001).

hypothesized moderator variable and by repeating the procedure, i.e. testing the homogeneity assumption repeatedly.

2.4.2 Meta-Analysis Procedure and Techniques

Selection and coding of studies

As a first step of our meta-analysis on the two identified strands of literature, we conduct a comprehensive literature research on the issue of book-tax differences/book-tax conformity in common electronic databases and editorial sources (Business Source Premier, IDEAS, EconPapers, EconBiz etc.). For this purpose, we use the following keywords: "book-tax conformity", "book-tax differences", "book-tax gap", "earnings management", "tax sheltering", "tax aggressiveness" and "tax avoidance". In addition to that, we scan relevant review papers (e.g. Hanlon and Heitzman (2010); Graham et al. (2012a)), references of collected papers, conference databases as well as researcher Curriculum Vitae (CV) to identify further empirical studies potentially relevant to our topic. As a starting point, we also take into consideration unpublished (working) papers to avoid a possible publication bias.[75] In the review process of the potential papers, we then screen titles, abstracts and descriptions to search for studies that either assess a potential association between BTD and earnings management and/or tax sheltering (BTD as independent variable) or examine the determinants/drivers of BTD (BTD as dependent variable). This proceeding results in a final sample consisting of 27 relevant papers (24 published and 3 un-published, see Table 3) related to the first strand of literature, i.e. the relationship between BTD and proxies for EM/TS, and 34 studies (25 published and 9 unpublished, see Table 5) associated with the second strand of literature, i.e. the drivers/components of BTD, between 1997-2015.

In a second step, these identified papers are coded by two researchers independently. Coding of the studies focuses, in particular, on the different measures of BTD (e.g. Total BTD, Temporary BTD, DTAX, BTC index, and measured vs. approximated BTD).[76] For the first meta-analysis strand (BTD as independent variable), differences in the dependent variables, i.e. the diverse earnings management and/or tax sheltering measures[77], institutional features (e.g. degree of book-tax conformity in a respective country vs. cross-country studies; individual vs.

[75] Nevertheless, we are aware that this could imply both strength and weaknesses. Pomeroy and Thornton (2008) state that, in principle, aggregating both published and unpublished results accounts for potential implications of statistically non-significant results, mitigating publication and replication bias. Unpublished studies, however, are likely to exhibit inconsistent research quality since they have not fully survived a peer review process.

[76] See chapter 2.2 for more information on the different BTD and BTC measures.

[77] See chapter 2.3.2 for more information on the different EM and TS measures.

consolidated accounts) and design characteristics (e.g. Ordinary Least Squares (OLS) vs. Logit/Probit; additional controls for accruals or tax measures) are taken into account as potential moderators. Moreover, common key statistics, such as t-values, p-values, sample sizes, standard deviations and coefficients are recorded. Regarding the second strand (BTD as dependent variable), we code all major control variables[78] used in primary studies including their respective sign and significance level (t- or p-value). For both meta-analysis strands, multiple specifications per paper are only included if they differ with regard to the identified moderators and/or the independent variables included.

Methodology

Meta-Regression Analysis (1st strand)

In contrast to the majority of accounting meta-studies which use classical meta-analysis techniques (e.g. according to Hunter and Schmidt (2000, 2004) or Lipsey and Wilson (2001))[79], most modern meta-studies go beyond that and turn to meta-regressions. An important advantage of this type of analysis is that moderators are considered simultaneously (hierarchical analysis). This is especially important as moderator variables are often correlated and an isolated consideration may lead to distortions and errors of interpretation. Therefore, meta-regression analysis explicitly introduces relevant explanatory variables concurrently to investigate the extent to which these can explain heterogeneity in primary studies (Harbord and Higgins (2008)).

As already discussed, there is substantial diversity with respect to the measurement of BTD/BTC as well as with regard to the definition of the proxies for EM and TS in the reviewed papers. Therefore, for the first strand of literature we rely on t-values as dependent variable of our meta-regression rather than on coefficients.[80] The reason for this is that t-values properly indicate the sign as well as the significance level of correlations and that they are fully comparable across studies which use very different variables (Card et al. (2010)). This allows us to draw conclusions across a wide range of diverse studies. Estimated coefficients, on the other hand, would not be comparable as the variables in our sample are not dimensionless, i.e. the studies employ different units and constructs (Baskaran et al. (2014)). The dependent and independent variables used in primary studies are, for example, scaled differently and range from dummies and ratios to continuous variables. Therefore, the coefficients differ

[78] See Table 5.
[79] For more information on that, see chapter 2.4.1.
[80] For further meta-regression analysis relying on t-values, see Card et al. (2010); Baskaran et al. (2014); Klomp and de Haan (2010); Heinemann et al. (2016).

systematically and the estimation of a consensus estimate/average effect size[81] would not be meaningful in our setting.

Our basic meta-regression equation is presented in the following:[82]

$$\hat{t}_{s,i} = t_0 + X_{s,i}\beta + \varepsilon_{s,i} \quad (3)$$

$\hat{t}_{s,i}$ specifies the estimated t-value of specification i of primary study s.[83] t_0 represents the intercept and thereby the defined baseline t-value (see below). As explained, we expect that heterogeneity in the estimates of primary studies can be explained by a vector of variables which describe study-specific characteristics (X: moderating factors) as well as sampling error (ε). The definition of a baseline is necessary because of the kind of coding of the moderator variables. As these are defined as dummy variables which basically can be sub-grouped to identify a particular study feature, they are mostly self-excluding. If all of these dummies would then be considered simultaneously in the regression analysis, there would be perfect multi-collinearity (dummy variable trap). Therefore, we define one particular characteristic as the baseline for each subgroup. The intercept then captures all baseline features at the same time and the reported coefficients have to be interpreted in relation to this baseline (Heinemann et al. (2016), p. 10).[84] The results of the MRA will be presented in chapter 2.5.1.

Stouffer (combined) test (2nd strand)

For the second strand of literature, we focus on the impact of various factors potentially impacting on BTD, rather than on a single statistical association as in the case of the first strand. We therefore rely on a different methodological approach here.[85] Specifically, in order to examine the drivers of BTD, we statistically summarize the effects of various independent variables on BTD using a combined significance test. The Stouffer test[86] is based, in principle, on an overall Z score. As a first step of this approach, all t-values of the estimates of the reported independent variables in primary studies have to be converted into their corresponding one-

[81] In order to obtain this value, individual study results are combined to an overall or consensus estimate with respect to the size of effects by assuming between-study homogeneity (see Heinemann et al. (2016), p. 9).

[82] Standard errors are clustered at study level.

[83] Referring to equation (1), $\hat{t} = \frac{\hat{Y}}{sd}$.

[84] For more information on the included moderator variables and the baseline, see chapter 2.5.1.

[85] For a comparable approach see Hay et al. (2006).

[86] For more information on the combined significance test, see Wolf (1986). The Stouffer test was also used by Kinney and Martin (1994); Hay et al. (2006); Lin and Hwang (2010); and Hay (2013).

tailed p-values[87] and then to z-statistics as the measure of effect size. The individual z-values are then combined using the following formula (Wolf (1986), p. 20):

$$Z_s = \frac{\sum_{i=1}^{k} Z_i}{\sqrt{k}} \tag{4}$$

where Z_i equals the standard normal deviate and k represents the number of independent tests combined. Z_s can then be compared to the standard normal distribution as a test of the cumulative evidence on the common null hypothesis.[88] We apply this procedure and calculate the overall Z_s values for all independent variables that occurred more than five times as potential drivers of BTD in primary studies (k>5) (see chapter 2.5.2). We do so to determine whether, in aggregate, there is a significant positive, significant negative or no significant correlation between the respective independent variable and BTD.

One fundamental issue related to meta-analysis is the so-called "file drawer" problem. Specifically, it is more likely that empirical studies which report significant results are published compared to papers with insignificant findings. This potentially distorts the presentation of the "true" economic effects. One potential approach to addressing this problem is the "fail-safe N" test which determines the number of studies with an average effect of zero that would be necessary in addition so that the overall (Stouffer) test becomes insignificant. For a significance level of 5 %, this figure can be calculated according to the following formula (Wolf (1986)):

$$X = \left(\frac{\sum_{i=1}^{k} Z_i}{1.645} \right)^2 - k \tag{5}$$[89]

where X equals the looked for number of additional studies with a zero effect. We calculate this "fail safe N" for all independent variables (k>5) that show an overall significant correlation with BTD in order to determine the robustness of our results. The results of the Stouffer (combined) test and the Fail-safe N test will be discussed in chapter 2.5.2.

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[87] Two-tailed p-values have to be converted into one-tailed p-values as well, see Darlington and Hayes (2000); Whitlock (2005).

[88] As Z_s goes from negative infinity to infinity, (overall) P will go from 0 to 1, and any value of P will uniquely be matched with a value of Z and vice versa.

[89] The following relation applies: $\bar{Z} = \frac{\sum_{i=1}^{k} Z_i}{k+X}$.

2.5 Results

2.5.1 Association between BTD and proxies for TS/EM

Descriptives

In the following, we present information on the specific characteristics of our MRA sample. For this purpose, Table 7 provides a summary regarding the variables included in the MRA with respect to the number of observations and the percentage share in relation to the total number of 62 observations, the number of studies employing the respective variable,[90] the mean t-value as well as the minimum and maximum t-values.[91]

Table 7: Summary statistics for the variables included in the MRA

Variable	Obs.	% sample	# studies	Mean t-value	Min.	Max.
Dependent variable						
TS	41	66	17	1.55	-5.34	10.40
EM	21	34	12	1.21	-5.26	4.42
Independent variable of interest						
Total BTD	32	52	20	1.85	-4.43	5.80
Other BTD	21	34	13	1.87	-3.89	10.40
BTC Index	9	15	5	-1.03	-5.34	2.59
Approxim. BTD	50	81	23	0.85	-5.34	10.40
Measured BTD	12	19	6	3.88	1.57	5.80
Level of BTC[92]						
Low	43	69	19	1.49	-4.43	6.73
Medium	6	10	4	4.25	1.57	10.40
High	4	6	2	2.22	-1.96	4.45
Financial statements						
Consolidated	58	94	24	1.47	-5.34	10.40
Individual	4	6	3	0.90	-1.96	1.97
Methodology						
OLS	30	48	16	1.74	-5.34	10.40
Logit/Probit	32	52	14	1.15	-4.43	4.45
Controls (for)						
DA/TA	21	34	13	1.06	-5.25	4.42
ETR/UTB	10	16	4	-0.13	-4.43	2.47
Additional BTD	7	11	3	0.79	-0.53	2.47
Total	**62**	**100**	**27**	**1.44**	**-5.34**	**10.40**

First of all, it can be noted that on average the 27 studies in our sample report a positive association between BTD and TS/EM indicated by a t-value of 1.44 which, however, lacks

[90] Because several studies employ more than one dependent and independent variable, the sum of studies exceeds the total number of studies.

[91] We abstain from weighting observations, e.g. by the inverse of the share of observations per study in relation to the full sample, as the number of observations extracted from primary studies is rather equally distributed (1-6 specifications per study).

[92] The remaining 15% of the observations represent cross-country studies. This variable is, however, redundant to BTC.

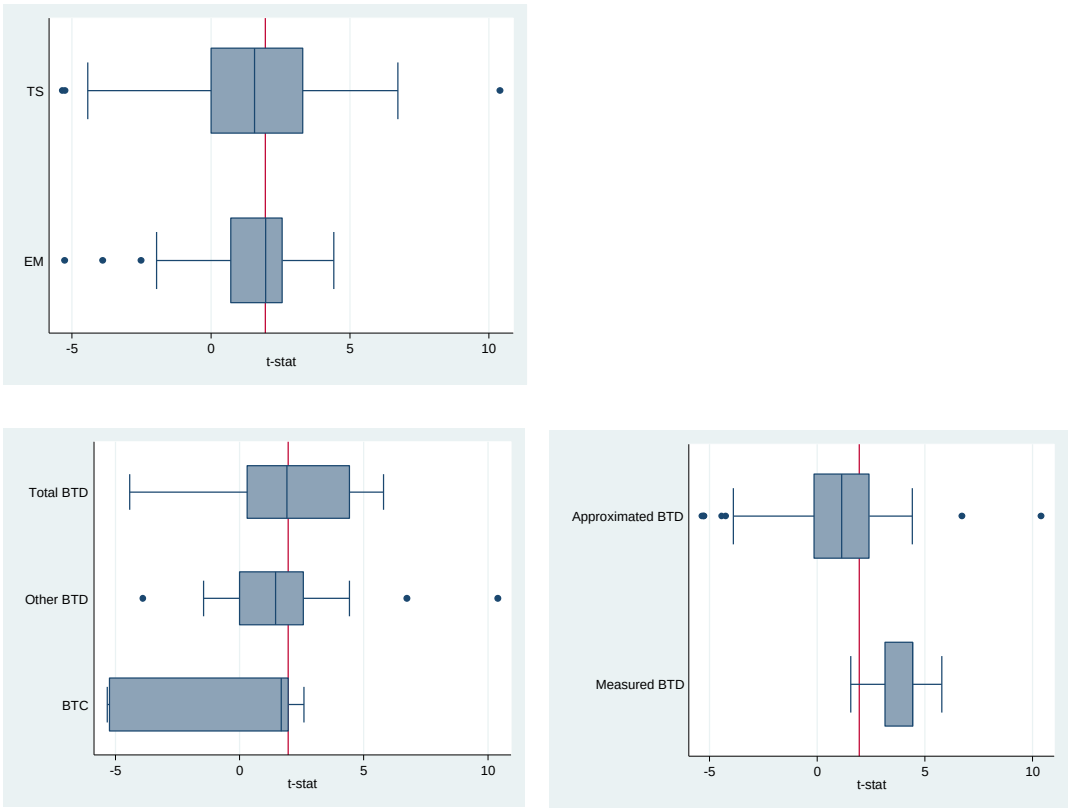
statistical significance at conventional levels.[93] In addition, there is a great variety in results ranging from highly significant negative (t-value of -5.34) to highly significant positive effects (t-value of 10.4).

Table 7 further reports differences regarding the dependent as well as the independent variables applied in primary studies. Due to our comparably small sample size (62 obs.), we aggregate categories such that we only differentiate between EM and TS proxies in general instead of examining all eight categories of dependent variables discussed in chapter 2.3.2 separately; otherwise, there would be too few observations per single category. The same applies to the measurement of the independent variable of interest. Therefore, we distinguish between Total BTD, Other BTD including all measures which try to approximate BTD more precisely (including: Temporary BTD, Discretionary BTD, Permanent BTD, DTAX, BTD with the effect of tax sheltering removed, Discretionary Total BTD DD) and cross-country studies using a BTC index. Concerning the dependent variable, more studies in our sample examine TS (66%) than EM (34%). Although the mean t-values of both groups exhibit a positive sign, they lack statistical significance. In addition, min and max t-values demonstrate substantial heterogeneity in the results of primary studies (ranging from negative significant to positive significant findings). With regard to the independent variable of interest, more than half of our sample uses Total BTD (52%), whereas only 34 % rely on other, more precise, BTD measures. The mean of both BTD groups' t-values is positive and indicates significance at the 10% level. There is, however, again great heterogeneity in results. Studies analyzing a BTC index (15%), by contrast, report an overall negative, but insignificant t-value. The negative sign is plausible as a large BTC index implies a high degree of conformity in a given country. This in turn is expected to go along with lower BTD and therefore less EM and TS (inverse correlation). A further important feature of the independent variable is whether BTD are actually measured or only approximated from financial statement information. 19% of our sample measure BTD based on real tax return data, whereas 81% only estimate the variable using financial statement information. Remarkably, the mean t-value of studies measuring BTD is considerably higher (3.88) compared to the mean t-value of studies approximating BTD (0.85) and indicates statistical significance at the 1% level. Furthermore, there is less variation in t-values, all pointing into the same direction (positive association).

[93] We refer to a critical t-value of 1.65 at 10 % level significance, 1.96 at 5% level and 2.58 at 1% level significance.

In addition, the following graphical analysis employing boxplots (Figure 1) serves to illustrate the heterogeneity of studies with regard to their dependent and independent variable measurement and is intended to provide further insights into the distribution of t-values.

Figure 1: Boxplot for the classification of the dependent and independent variable



The boxes' margins indicate the 25% and 75% quartiles whereas the vertical line in between displays the respective median t-value. The antennas span 1.5 times the interquartile range and the single dots represent outliers. The red line marks the 5%-threshold for statistical significance (*t*-value = 1.96[94]) (Heinemann et al. (2016)) indicating that values on the right hand sight reflect a significant positive association. Comparing the boxplots for TS or EM as dependent variable, it is obvious that 50% of the EM sample reports statistically significant positive results, whereas the median t-value for studies examining TS is slightly below the 5% threshold which implies that less than 50% of TS studies find a significant positive relation. Furthermore, papers using TS proxies as dependent variable exhibit considerably more variation in results. The lower section of Figure 1 compares boxplots for the different measures of the independent variable. While almost fifty percent of the studies using Total BTD find a positive and significant association, there is extreme scattering in results also covering studies that report a significant negative relationship. Papers that exploit Other BTD measures, by contrast, find less significant

[94] This corresponds to the critical value of the *t*-distribution at the 5 % threshold.

positive results, but entail, at the same time, lower dispersion (e.g. almost no significant negative results). Analyses relying on BTC indices find significant positive results in only 25% of cases. In line with the above explained reversed association, most of these papers report (significant) negative effects. Finally, it is remarkable that almost all studies employing measured BTD consistently report significant positive results, whereas there is great variation in findings of studies which only approximate BTD.

Lastly, Table 7 contains further variables included as controls in the MRA. First, the level of book-tax conformity in the respective country, distinguishing between low, high and medium BTC, is considered. The majority of studies in our sample (69%) are conducted in a low BTC country. This makes sense as most investigations examine the US setting. With regard to the type of financial statements, almost all papers use data from consolidated (94%) instead of individual accounts for their analysis. From a methodological point of view, approximately half of the studies (48%) conduct an OLS regression analysis, whereas the other half (52%) rely on Logit/Probit analyses, i.e. on a binary dependent variable. Furthermore, some studies additionally control for discretionary (DA) and/or total accruals (TA) (34%), for tax avoidance measures such as ETR and/or UTB (16%), or for the fact that more than one BTD measure is considered in their regression simultaneously (11%).

Meta-Regression Analysis Results

As outlined in chapter 2.4, the definition of a baseline is necessary for the Meta-Regression Analysis. To that end, our baseline is specified as an estimation of the association between *approximated* BTD, captured via *Other BTD* proxies, and *TS* in a country with a *low* level of BTC using data from *consolidated* financial accounts and applying an *OLS* regression analysis. The selection of the baseline is primarily based on the most common study features in our sample (see Table 7). An important exception represents the BTD proxy. While Total BTD is used most frequently, Other BTD measures are expected to capture TS and EM behavior more precisely and are therefore included in our baseline. Taken together, all the baseline features are contained in the intercept of the MRA. The other reported coefficients have to be interpreted relative to this baseline and present the impact of a deviation in this particular feature from the baseline (Heinemann et al. (2016)).

Table 8 summarizes our estimation results.[95] Column (1) presents the results of the main specification including the study features outlined above. While we report the basic coefficients

[95] The Table is divided into subsections by headlines indicating the respective group of study features as well as their respective baseline category. The definition of the baseline study is constant throughout all specifications.

on the left-hand side, we additionally present the results of the joint F-test in column "Joint effect baseline" in order to examine whether our baseline modified by the respective variable (specific study feature) exhibits (joint) significance. Furthermore, we extend the main specification and vary the sample composition in order to test the robustness of our results. First, we include three additional control variables in our MRA, i.e. dummies capturing whether studies control for DA/TA, for UTB/ETR and/or for Additional BTD measures (column (2)). The second extension relates to the analysis of a potential publication bias. In this regard, we exclude unpublished (working) papers (column (3) and (4)) to examine whether our results remain unchanged when we only investigate published studies.

It uses *TS* as dependent variable, *approximated other BTD measures* as independent variable, relies on *consolidated* financial statement data in a *low* BTC country, and uses *OLS* as methodological approach.

Table 8: Meta-Regression Analysis - Results

	(1) Main specification	Joint effect baseline	(2) With controls	Joint effect baseline	(3) Main specification, published	Joint effect baseline	(4) With controls, published	Joint effect baseline
Baseline effect	2.16		2.46		2.93		3.3	
	[2.18] **		[1.97] *		[2.36] **		[2.37] **	
Dependent variable, Baseline: TS								
EM	1.41	3.57 **	1.07	3.53 *	1.23	4.16 **	0.7	4.00 **
	[1.22]		[0.83]		[0.98]		[0.46]	
BTD measure, Baseline: Other BTD								
Total BTD	-1.05	1.11	-0.82	1.64	-1.04	1.89 *	-0.87	2.43 *
	[-1.76] *		[-1.25]		[-1.59]		[-1.19]	
BTC Index	-3.99	-1.83 *	-4.05	-1.59 *	-4.58	-1.65 **	-4.65	-1.35 **
	[-2.01] *		[-1.86] *		[-2.17] **		[-2.03] **	
Measured BTD, Baseline: Approximate	2.62	4.78 ***	2.15	4.61 ***	1.88	4.81 ***	1.39	4.69 ***
	[1.73] *		[1.32]		[1.13]		[0.80]	
Level of BTC, Baseline: Low								
Medium	1.22		1.12		1.93		1.74	
	[0.59]		[0.55]		[1.19]		[1.09]	
High	0.42		0.25		0.64		0.7	
	[0.28]		[0.16]		[0.44]		[0.42]	
Financial statements, Baseline: Consolidated								
Single	-1.39		-1.36		-1.82		-1.86	
	[-0.72]		[-0.69]		[-0.86]		[-0.80]	
Methodology, Baseline: OLS								
Binary	-1.25		-1.20		-1.91		-2.05	
	[-1.53]		[-1.34]		[-1.85] *		[-1.71]	
Controls								
DA / TA			-0.08				0.55	
			[-0.08]				[0.43]	
UTB / ETR			-1.47				-1.87	
			[-2.36] **				[-2.61] **	
Additional BTD			0.51				0.45	
			[0.92]				[0.73]	
N	62		62		55		55	

Notes: Clustered *t*-statistics in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

In the case of the main specification (column (1)), the average consensus *t*-value for the baseline study is equal to 2.16. More precisely, primary studies exhibiting the design features defined above are found to report, on average, a positive and statistically significant association between BTD and TS at the 5% level. This also applies to the specification including additional control variables (column (2)). In addition, coefficients are estimated with statistical precision at the 5 % level. This holds true for all specifications in Table 8 (except for column (2): at the 10% level). The baselines in the specifications considering only published studies (columns (3) and (4)) even indicate a positive and statistically significant association at the 1% level. This hints at a potential publication bias. Results obtained from (refereed) journal articles seem to be, on average, associated with higher levels of statistical significance compared to those obtained from working papers.

Relative to the baseline, variation in the dependent variable, i.e. assessing EM instead of TS, basically leads to the same result, i.e. to a positive and statistically significant association with BTD. Nevertheless, the average consensus t-value increases (3.57 = 2.16+1.41 = baseline effect + coefficient for EM) indicating a higher level of significance (at the 1% level) compared to the baseline. This implies an even stronger association between BTD and EM proxies (in all specifications). Coefficients are again estimated with statistical precision (see column "Joint effect baseline"). As a first interim conclusion, it can therefore be noted that BTD seem to capture opportunistic reporting behavior and serve as a positive indicator for both TS as well as EM. However, they seem to be an even better signal for EM.

Variation in the independent variable, i.e. the BTD/BTC measure, changes results more substantially. Using Total BTD instead of Other BTD exerts an inverse influence (coefficient: -1.05) leading to an average positive t-value of 1.11 which indicates a significance level above the 10 % threshold. Thus, an overall significant association between BTD (measured as Total BTD) and TS can no longer be recorded. This implies that the explanatory power of BTD for EM and TS strongly depends on how precisely BTD are measured and holds true for the specification including additional controls (column (2)) as well. Therefore, Total BTD being only a rough estimate of the book-tax gap seem to capture opportunistic reporting behavior worse than other BTD measures such as Temporary BTD, Discretionary BTD, Permanent BTD, DTAX, BTD with the effect of tax sheltering removed or Discretionary Total BTD according to Desai and Dharmapala which are explicitly aimed at approximating EM and TS behavior. This can also be interpreted as evidence for the suspected measurement error associated with Total BTD (see chapter 2.2). The analysis of the specifications which examine only published studies (column (3) and (4)) provides a further hint for a potential publication bias. The overall

positive t-values (1.89, 2.43) indicate significance at the 10% (column (3)) and 5% level (column (4)) and point to studies published in (refereed) journals being generally more likely to report positive and statistically significant effects. Using a BTC Index instead of Other BTD exerts an even stronger negative influence (coefficient: -3.99) which results in an overall negative t-value of 1.83, implying significance at the 10% level. This is plausible as there is an assumed reversed association between BTC and BTD (see discussion above). This effect seems, however, not to be stable across the other specifications as the joint overall t-values lie above the 10%-threshold of -1.65 (see columns (2) - (4)).

Varying the kind of measurement of BTD exerts the strongest influence on results. Using actually observed instead of approximated BTD implies an average t-value of 4.78 and, thus, a statistically significant positive association at the 1% level (for all specifications).[96] This provides evidence for measured BTD capturing TS and EM behavior more reliably and more precisely than only approximated BTD and is in line with the arguments brought forward by Hanlon (2003) and McGill and Outslay (2004). In particular, they point at the various problems related to the estimation of taxable income from financial accounts as tax disclosures in financial statements are insufficient to draw valid conclusions about taxable income and actual taxes paid in a given fiscal year (see chapter 2.2).

To sum up, our MRA results point to an overall statistically significant and positive association between BTD and opportunistic reporting behavior. This implies that BTD are indeed indicative of both EM and TS, and even better so of EM. The results are, however, weaker for studies that only capture BTD roughly based on Total BTD instead of using more precise proxies (such as DTAX, Temporary BTD etc.). Moreover, examining actual BTD computed from tax returns instead of only approximating them from financial statements strongly increases the effects. Even though we cannot draw a definite conclusion with regard to BTC, our results suggest a negative association with EM and TS. This is also substantiated by the provided evidence on a positive relation between BTD and aggressive reporting, given the inverse correlation between BTD and BTC outlined above. Hence, our results support the findings of Tang (2015).

2.5.2 Components of BTD

Having examined whether BTD constitute an indicator of aggressive reporting, we analyze in a second step which particular factors actually drive BTD. Specifically, the purpose of this analysis is to explore whether and how specific determinants discussed in the literature impact

[96] Coefficients are estimated with statistical precision at the 1 % level (see column joint effect baseline).

on BTD, possibly being a proxy for tax sheltering and/or earnings management, and whether the observed effects depend on the kind of BTD measure examined. To this end, we analyze those variables that are most frequently assessed as potential drivers of BTD (see chapter 2.3.3). For each of these identified variables, Table 9 provides information on the total number of observations and reports the number of positive, negative and insignificant results with regard to the impact on BTD. It also entails the sign and significance of the Stouffer combined test and the related fail safe N (file drawer test). In addition, Table 9 also lists the number of observations separated according to the type of BTD. In that regard, we again distinguish Total BTD and Other BTD[97], which are intended to more precisely measure EM and/or TS. For each of these two types of BTD, we also report the sign and significance of the separate Stouffer test. The commentary of our results builds on the discussion of the contemplated variables provided in chapter 2.3.3.

[97] We investigate the specific BTD measures (DTAX, Discretionary Total BTD, Permanent BTD, Temporary BTD) in a condensed manner as "Other BTD", as there are too few observations for each BTD type to render isolated analyses meaningful.

Table 9: Summary of results from meta-analysis of selected independent variables

		Overall assessment							Total BTD			Other BTD		
			Number of significant results			Stouffer test				Stouffer test			Stouffer test	
Attribute	**Independent variable**	**# sets of results**	Pos.	Neg.	Not sign.	Sign.	Sign	File drawer studies at p=0.05	**# sets of results**	Sign.	Sign	**# sets of results**	Sign.	Sign
Size	Market Capitalization	32	7	11	14	0	neg.	267	13	0.45	not sign.	19	0	neg.
	Total Assets	36	14	9	13	0	pos.	395	19	0	pos.	17	0.01	neg.
Growth	Sales growth	21	8	3	10	0.01	pos.	24	10	0.01	pos.	11	0.13	not sign.
	Investment growth	10	3	3	4	0.19	not sign.	-	6	0	pos.	4	0	neg.
Liquidity	Cash holding	9	0	2	7	0.2	not sign.	-	2	0.01	pos.	7	0.02	neg.
Profitability	ROA/RNOA/ROE	51	38	3	10	0	pos.	42,409	19	0	pos.	32	0	pos.
	Loss Dummy	7	0	4	3	0	neg.	148	3	0	neg.	4	0.11	not sign.
	NOL Dummy	45	31	2	12	0	pos.	5,176	16	0	pos.	29	0	pos.
	Change in NOL	37	12	15	10	0	neg.	477	14	0.01	neg.	23	0	neg.
Leverage	Leverage	68	24	10	34	0	pos.	1,069	34	0	pos.	34	0.03	pos.
Capital intensity	Capital intensity	9	2	1	6	0	pos.	18						
	PPE	36	18	4	14	0	pos.	3,304						
	Capital intensity (aggregated)	45	20	5	20	0	pos.	3,929	21	0	pos.	24	0	pos.
Intangibles	Intangibles	35	6	9	20	0.03	neg.	10	14	0.16	not sign.	21	0.05	neg.
R&D expense	R&D expense	18	10	3	5	0	pos.	397	5	0	pos.	13	0	pos.
Market evaluation	Market-to-Book ratio	35	5	14	16	0	neg.	581	15	0	neg.	20	0.02	neg.
Accruals	Abnormal total accruals	18	16	1	1	0	pos.	1,084	8	0	pos.	10	0	pos.
	Pretax discretionary accruals	8	3	3	2	0.01	pos.	9	3	0	pos.	5	0.37	not sign.
	Lagged BTD	19	16	2	1	0	pos.	6,260	9	0	pos.	10	0	pos.
Equity income in earnings	Equity income in earnings	36	6	16	14	0	neg.	226	15	0.41	not sign.	21	0	neg.
Foreign operations	Foreign Income/MNC dummy	13	5	2	6	0	pos.	138	5	0.02	pos.	8	0	pos.
	Foreign income amount	34	17	11	6	0	pos.	7,678	14	0	pos.	10	0	pos.
Audit characteristics	Big 4 dummy	8	0	2	6	0.02	neg.	4	5	0.05	neg.	3	0.13	not sign.
Ownership characteristics	Institutional ownership (%)	11	3	2	6	0	pos.	57	6	0	pos.	5	0.2	not sign.

The first major factor is firm size, captured by two different variables, namely *market capitalization*[98] as well as *total assets*. Overall, there are 68 sets of results for these two variables. Theory and existing empirical evidence on the association between firm size and BTD is mixed.[99] Indeed, our results are somewhat mixed as well: Starting with *market capitalization*, overall nearly half of the results report insignificant effects, and there are slightly more negative than positive observations. Overall, the combined Stouffer test yields a significant negative result. Interestingly, the Stouffer test turns insignificant if Total BTD are examined in isolation, whereas it is still highly significant and negative for Other BTD. Overall, arguing that specific BTD measures capture earnings management and tax sheltering more precisely than Total BTD, the numbers are more in line with an alleged negative effect of firm size on BTD, and thus, on opportunistic reporting. The picture is, however, somewhat different for *total assets*. Here, there are more positive than negative results and the overall Stouffer test is positive as well. In addition, the higher number for the file drawer test (395 vs. 267) points to a more robust finding. Yet, this is again challenged by the divergent results for the BTD type analysis: While the Stouffer test is positive for Total BTD as well, Other BTD yield a negative result. Hence, the overall result could be driven by the (slightly more numerous) observations with Total BTD, which are assumed to be a less precise indicator for opportunistic reporting. In total, our results do indicate that size is an important factor of influence. Moreover, there is some indication that the association between size and EM/TS is negative, given that the more specific BTD measures consistently find a negative overall result. This would be in line with political cost theory (see chapter 2.3.3).

Next, we turn to growth. This attribute is also captured by two variables, *sales growth* and *investment growth*, with sales growth exhibiting more than twice as many observations than investment growth. In general, growth is expected to be positively associated with BTD, as growing firms carry out more investments, thus giving rise to more (temporary) BTD relating, for instance, to depreciation. In addition, growth is considered as a proxy for an economic upswing as well as for firm complexity, both of which are rather suspected to show a positive association with BTD. As regards the *sales growth* variable, Table 9 reports a positive and significant overall Stouffer test in line with previous expectations, but the file drawer test (fail safe N = 24) reveals that this result is

[98] Market capitalization refers to the market value of equity. It is commonly computed as the number of shares outstanding multiplied by the price per share, see e.g. Armstrong et al. (2012).

[99] See chapter 2.3.3.

not overly robust. In line with that, the separate Stouffer test for Other BTD turns out to be insignificant. However, if growth rather gives rise to temporary BTD, this finding could be due to the impact of BTD measures based on permanent BTD.[100] Indeed, the Stouffer test for Total BTD, which explicitly includes temporary BTD, still is positive. Yet, results are again quite mixed for the *investment growth* variable. The overall Stouffer test is insignificant; however, also here, the test explicitly relating to Total BTD is significant and has a positive sign (in line with the notion that investment creates temporary BTD, being a part of Total BTD).[101] Therefore, in total, we conclude that evidence building on Other BTD (which are often restricted to permanent BTD) is not clear cut, as growth conceptually rather relates to EM and TS that create temporary BTD. Taking this into account, our results tend to be more in favor of a positive impact of growth on BTD.

With regard to liquidity, captured by firms' *cash holdings*, the expectation derived from existing literature is that EM/TS activity (hence, BTD) is larger if liquidity is low, i.e. if there is a need to increase liquidity. The total number of observations for our cash holding variable is rather low. We find mostly insignificant results and the overall Stouffer test yields an insignificant result as well. But interestingly, the result is negative and significant for the separate examination of Other BTD, despite of a fairly low number of observations. Again assuming that these BTD are more precise proxies to capture EM and TS, we interpret this as a possible hint for lower liquidity indeed increasing EM and/or TS.

The attribute that is most frequently taken account of in empirical investigations is profitability. Since profitable firms have a stronger incentive to engage in tax sheltering, a positive association with firms' profitability is expected. In line with that expectation, we find very consistent and robust (fail safe N = 42,409) results for our profitability variables (*ROA/RNOA/ROE*) across all BTD types. By contrast, the association of the *loss dummy* variable (indicating the existence of a loss) with BTD was ex-ante assumed to be negative. Indeed, the overall Stouffer test is negative and fairly robust given the small number of observations (fail safe N = 148). Yet, as we yield an insignificant Stouffer test result for Other BTD, we abstain from drawing a definite conclusion for the *loss dummy*

[100] Specifically, Other BTD comprises Temporary BTD and Discretionary Total BTD, but also DTAX and Permanent BTD. However, temporary differences would not be reflected in DTAX and Permanent BTD, which could be decisive for the overall insignificant result yielded for Other BTD.

[101] The result for Other BTD is negative, but 3 out of 4 BTD measures that are part of this sub-analysis are of permanent nature; thus, this result may not be surprising.

variable. As regards the *NOL dummy*, expectations are not clear-cut. However, in line with Manzon and Plesko's (2001) notion that tax-advantaged positions are costly to unwind and that firms with NOL carry forwards may engage in income increasing earnings management, we find a consistently positive and robust association of the NOL Dummy with BTD. Lastly, our results point to a consistently negative, robust association for the *change in NOL* variable, which also is in accordance with prior literature.[102]

Prior evidence on the impact of *leverage* is somewhat mixed. From a tax sheltering perspective, a negative association is plausible, whereas from an earnings management point of view, the anticipated association is rather positive. In fact, the results in Table 9 point to a consistent positive impact of leverage on BTD. We therefore contend that the assumed positive impact from earnings management outweighs the assumed negative influence relating to tax sheltering. Essentially, however, this only constitutes a presumption, in particular, since most studies finding a positive coefficient do not further comment on this result.[103]

We capture capital intensity by two variables; namely by the level of *PPE* and the level of PPE, intangibles and inventories combined (*capital intensity*). As these two variables are conceptually very similar, we additionally condense the two variables into one aggregated measure. As discussed in chapter 2.3.3, the expected association is positive for all variables. Indeed, we identify a consistently positive impact, even though the results for *PPE* are more robust than for *capital intensity* (fail safe N 3,304 vs. 18). Regarding the aggregated measure, the positive impact also applies to Other BTD, despite the fact that there is a large share of permanent BTD measures in this category.[104] Overall, these findings are in accordance with a strong, positive impact on BTD.

In a similar vein, we anticipated a positive association between *intangibles* and BTD. However, quite unintuitively, the overall Stouffer test is significant and negative. Yet, given the very low fail safe N (10), we have to stress that this finding cannot be considered very robust. Moreover, there is a considerable number of insignificant results, and

[102] In particular, it has been brought forward that the change in NOL is not related to tax planning, and thus, that no positive association with BTD is to be expected. Moreover, according to Manzon and Plesko (2001), this finding is consistent with an overestimation of taxable income in periods when losses are incurred, see chapter 2.3.3.

[103] Frank et al. (2009) are the only ones to comment that "firms with more aggressive tax reporting are […] more highly levered" and that "we find that financial reporting aggressiveness is positively related to […] leverage".

[104] BTD relating to PPE/capital intensity are primarily driven by depreciation and are thus of a temporary nature.

analyzing Total BTD alone also yields an insignificant Stouffer test. The negative result for Other BTD could indicate that intangibles are not used for EM/TS, but we abstain from drawing any definite conclusions for this variable.[105]

The consistent, positive and robust (fail safe N = 397) results for *R&D expenses* are in line with empirical evidence previously provided (Rego and Wilson (2012)). Specifically, our results are in accordance with the finding that tax aggressiveness is systematically associated with R&D expenditures.

The *market-to-book ratio* has been widely used as another proxy for a firm's growth prospects. As such, a positive association with BTD was more likely to be expected, given the alleged impact of the related issues of depreciation, complexity and volatility. Yet, our results point to a consistent and robust negative effect. We find this somewhat puzzling, and we did not find any explanations in studies yielding a negative effect either.[106] As regards the negative effect for Other BTD, however, we refer to our remarks on investment growth and the discussed distinction between permanent and temporary BTD relating to depreciation.

Previous research has determined a strong, positive association between earnings management and tax sheltering.[107] In line with that, we observe a consistently positive, robust (fail safe N = 1,084) result for *abnormal total accruals*, acting as a proxy for earnings management activity.[108] The overall association for *pretax discretionary accruals* is positive as well, however, this result is rather weak, which is reflected in a very low fail safe N and in an insignificant Stouffer test for Other BTD. Yet, it also has to be emphasized that there are considerably fewer observations for this variable than for abnormal total accruals. Finally, there is also consistent evidence for a positive impact of *lagged BTD*, which is indicative of the discussed persistent effect of BTD.

Our findings for *equity income in earnings* are somewhat puzzling. The ex-ante suspicion was to find a positive impact on BTD, given deterministic differences in consolidation

[105] Here again we have to point out that studies reporting negative coefficients unfortunately do not comment on their findings.

[106] Khurana and Moser (2009) only conclude that „we find that […] growth firms […] have fewer permanent BTD", without providing more detailed explanations on that finding.

[107] See for instance Frank et al. (2009).

[108] In investigations controlling for the impact of accruals, BTD are explicitly intended to capture tax sheltering. Therefore, we conclude a positive association between earnings management and tax sheltering.

rules. Yet, we observe an overall negative impact, though the Stouffer test turns insignificant for Total BTD.

As regards foreign operations, there was no clear expectation for the impact on BTD in the light of mixed prior evidence. In that regard, it could hold that multinational firms engage less in tax sheltering provided that they have access to other profit shifting strategies. But the impact on BTD (on EM/TS) could also be positive, for instance as a result of MNE's complexity or the possibility to designate earnings as permanently reinvested. In fact, for both variables examined (*foreign income dummy*, *foreign income amount*) we find consistent and robust evidence for a positive association with BTD.

Likewise, the impact of audit characteristics, specifically of the *Big 4 dummy*, was not unambiguous ex-ante. Here, the overall assessment yields a negative result, but the evidence is very weak with the file drawer test only amounting to 4 and with an insignificant Stouffer test for Other BTD. Thus, our results cannot provide consistent evidence on the impact of a Big 4 audit, in particular with regard to EM/TS.

Finally, we examine the influence of *institutional ownership*. Here as well, the expected direction of impact was not clear-cut in advance. Overall, we detect a positive association, and the file drawer test is fairly stable (N=57), given the rather small total number of observations. Considering that the Stouffer test for Other BTD turns insignificant, we cannot, however, provide completely unambiguous evidence for an association of institutional ownership with EM/TS behavior.

To sum up, we can first of all conclude that all examined variables – apart from *investment growth* and *liquidity*– do show a significant overall association with BTD. It is thus sensible to consider these variables in investigations studying the factors driving BTD or the factors driving EM/TS, respectively. Yet, we cannot draw clear conclusions for all variables as regards the sign and significance level of impact, at least not consistently for all BTD measures. Moreover, even though the separate analyses of Total BTD versus Other BTD are mostly in line[109] (11 variables), we also find 3 contradictory results with regard to the sign of influence and 8 variables with divergent results as to the significance level. Hence, given these divergent results relative to the kind of BTD measure, it can be

[109] I.e. the sign and significance of the Stouffer test are corresponding.

concluded that the BTD measures partially capture different things[110] and that Other BTD seem to be a more precise estimate of EM and/or TS.

Our results do provide clear and consistent evidence – as to the sign and significance level – for a positive impact on BTD of *profitability*, the *NOL dummy*, *leverage*, *PPE*, *capital intensity*, *R&D expenses*, *accruals* and *foreign operations*. Considering that we yield the same results with regard to Other BTD for these variables, we assume that they are positively related to increased levels of EM/TS. In terms of *size*, we assume that our results are in favor of a negative association with EM/TS, given that we consistently find negative results in relation to Other BTD. Similarly, our results provide a hint for lower *liquidity* indeed increasing EM/TS, given a negative and significant result for the separate examination of Other BTD. Arguing that book-tax differences relating to firm *growth* are predominantly of a temporary nature, we finally conclude - in view of a consistently significant and positive association with Total BTD[111] - that our results tend to be more in favor of a positive impact of growth on BTD. With regard to *intangibles*, *equity income in earnings*, the *Big 4 dummy*, and *institutional ownership*, our results are, however, not entirely unambiguous.

2.6 Conclusion

The empirical literature on tax accounting has been growing quickly over the last decade. As regards studies on the relation between BTD and opportunistic reporting behavior, we have identified two major interrelated strands: The first one analyses the association between BTD and EM and/or TS to evaluate whether BTD can indeed serve as an indicator for aggressive reporting. The second strand, in turn, takes that association for granted and examines which particular factors drive BTD (EM/TS, respectively). Heterogeneity in measures used as well as in reported findings induces us to conduct a comprehensive and systematic literature review as well as a quantitative meta-analysis.

The systematic literature review reveals the use of various BTD measures. While the majority of studies use Total BTD as a rough estimate of the book-tax gap, other investigations exploit more precise proxies, such as Temporary BTD, DTAX or

[110] For instance, even though Other BTD are intended (and indeed seem) to be a more precise indicator of EM/TS, it has to be kept in mind that not all of the comprised BTD measures capture all kinds of book-tax differences. Specifically, DTAX and Permanent BTD do not entail temporary book-tax differences, and thus no significant association with EM/TS based on temporary book-tax differences can be expected for these two BTD measures.

[111] Total BTD entail temporary BTD that may be excluded in the case of the Other BTD measure, see above.

Discretionary Total BTD. Moreover, only a minority of investigations is based on actual tax return data, while most studies have to rely on BTD measures estimated from financial accounts. In addition to that, more recent studies also develop particular measures for BTC by means of cross-country studies. Similarly, there are numerous variables used to capture EM and/or TS. To name just a few, these include binary variables indicating whether a firm has been identified as being engaged in tax sheltering or financial statement fraud, tax audit adjustments or discretionary accruals.

Beyond a qualitative review, the literature has reached a critical mass (27 studies) rendering MRA feasible and appropriate to summarize the overall evidence on the association between BTD/BTC and opportunistic reporting. This constitutes a rather innovative approach, given that there are only a few meta-studies in the accounting literature so far and that these utilize more basic methodological techniques such as simple homogeneity analyses.

For the first strand of literature, we provide a consensus estimate with respect to the sign and the statistical significance level for the association between BTD and proxies for EM and TS. Our MRA results point to a statistically significant and positive association between BTD and TS as well as between BTD and EM. The obtained results indicate a level of significance at the 5% threshold for TS and even at the 1% threshold for EM. This indicates that BTD are indeed indicative of both EM and TS, and even more so of EM. These results are, however, weaker for studies that only capture BTD roughly based on Total BTD instead of using more precise proxies (such as DTAX, Temporary BTD etc.). Moreover, examining actual BTD computed from tax returns instead of only approximating them from financial statements strongly increases the effects. Hence, efforts taken to accurately determine BTD seem to be worthwhile when it comes to the explanatory power for opportunistic reporting. Furthermore, our results as well as the alleged inverse correlation between BTC and BTD suggest a negative association between BTC and EM/TS. Hence, we would conclude that higher conformity is indeed effective in reducing aggressive reporting. In addition, our MRA hints at the existence of a potential publication bias in the tax accounting literature.

We also apply quantitative review techniques with regard to studies on the specific drivers and determinants of BTD (second strand of literature, 34 studies) and provide evidence for a positive impact of *profitability*, the *NOL dummy*, *leverage*, *PPE*, *capital intensity*, *R&D expenses*, *accruals* and *foreign operations* on BTD by using the Stouffer combined

test. Therefore, we conclude that these variables are positively related to increased levels of EM and/or TS and should certainly be taken into account in future studies on this topic. Our results are not entirely unambiguous, however, with regard to *intangibles*, *equity income in earnings*, the *Big 4 dummy*, and *institutional ownership*. In terms of *size* and *liquidity*, we conclude that our results are indicative of a negative association with EM/TS, given that we consistently find negative results in relation to Other BTD. Hence, it can be concluded that it is essential to choose an appropriate BTD measure for the respective research question at hand. In that respect, measures other than Total BTD are likely a more precise estimate of EM and/or TS.

Finally, we would like to discuss potential limitations of our study. First of all, as already emphasized, there exist no uniform definitions and standards for both BTD/BTC and EM/TS, such that primary studies use a variety of different measures.[112] This can also be traced back to data availability issues, e.g. tax return data or data on actual (tax or financial) fraud are mostly not accessible. Therefore, researchers have to rely on diverse proxies. As our overall sample size is comparably small, we do not obtain enough observations for each single category of BTD/BTC and EM/TS measures. Hence, we have to condense those in order to be able to conduct systematic analyses. This, however, possibly comes along with measurement imprecisions. Moreover, several moderator variables (such as the level of BTC or the type of financial statement) could not be further exploited in our MRA because of an unbalanced distribution of sample characteristics.

[112] This is a major difference to other meta-studies in the field of taxation, e.g. on the impact of taxes on FDI, see Feld and Heckemeyer (2011).

3 Book-Tax Conformity and Reporting Behavior– A Quasi-Experiment[113]

3.1 Introduction

There is an ongoing discussion among policymakers and academics on the costs and benefits of book-tax conformity. Particularly in the US, the question as to whether the link between financial and tax accounting should be tightened has been debated intensely in the past decade (Desai (2003, 2005); Hanlon and Heitzman (2010)). Essentially, proponents of an increase in book-tax conformity (e.g. Desai (2005)) argue that a one-book system would offer less leeway for opportunistic reporting behavior, i.e. earnings management and/or tax sheltering, and thus increase the quality of disclosed earnings. Opponents of conformity (e.g. Hanlon et al. (2008)), by contrast, whilst invoking the divergent objectives and recipients of both financial and tax reporting, argue that an alignment of the two sets of accounts would result in the loss of valuable information and therefore give rise to a decline in earnings quality.

The existing empirical evidence on the effects of book-tax conformity with regard to the extent of opportunistic reporting behavior and to earnings quality is not entirely unambiguous. There is, for example, no unanimity as to whether book-tax conformity leads to more or to less earnings management and tax sheltering (Blaylock et al. (2015); Tang (2015)). Furthermore, most studies find that the persistence of earnings is better in contexts of low conformity. However, at the same time, there is also evidence that large book-tax differences, which by intuition are rather to be expected in systems of low book-tax conformity, are indicative of earnings that are less persistent (Hanlon (2005)).

With respect to the measurement of book-tax differences/book-tax conformity and the empirical assessment of their influence, the majority of studies have in common that they (i) use a proxy for taxable income and (ii) derive the impact from cross-country variation, cross-firm variation or within-firm variation over time without an exogenous change of book-tax conformity legislation to identify its impact. In our study, we use a setting in

[113] We gratefully acknowledge the considerable support of Martina Ortmann-Babel and Ute Benzel (both Ernst & Young GmbH, Germany). We are indebted to Ernst & Young GmbH, Germany for facilitating this research and providing access to anonymous corporate tax return data. Moreover, we owe thanks to the Mannheim Taxation Science Campus (MaTax) for funding this research. We also thank Martin Jacob, Johannes Voget, Christoph Spengel and participants of the 78th Annual Conference of the VHB in Munich, the 39th Annual Congress of the European Accounting Association in Maastricht, the 5th Workshop on Current Research in Taxation in Prague and the MaTax Campus Meetings in Mannheim for helpful comments. Finally, we would like to thank the Stiegler Stiftung for financing conference participations. Any remaining errors are, of course, our own.

which firms have been subject to a comprehensive change in conformity as a consequence of the Accounting Law Modernization Act (*Bilanzrechtsmodernisierungsgesetz (BilMoG)*) in Germany. In addition, we employ a dataset of linked individual financial statements and actual tax return data, thus avoiding problems of approximating taxable income (Hanlon (2003)).

The BilMoG reform entered into force in 2010 and constituted a considerable change with regard to the traditionally close relationship between financial and tax accounting in Germany. In particular, it enables firms to exercise tax accounting options independently from financial accounting. This allows companies to decrease their taxable income without simultaneously decreasing their financial income and therefore creates incentives for tax sheltering.

Papers on a change in conformity are rare. Examples for partial modifications in the US setting include Dhaliwal and Wang (1992), Guenther et al. (1997) and Hanlon et al. (2008). More recently, Chan et al. (2010) and Chan et al. (2013) address a comprehensive change in conformity in China. We are, however, to the best of our knowledge, the first to exploit the transition from a one-book towards a two-book oriented system in a European country with a long-standing accounting tradition. In addition, and in contrast to most other studies using proxies for tax variables, we are able to observe the true taxable income in our data.

We contribute to the existing literature on the impact of a change in book-tax conformity on reporting behavior. Firstly, we assess whether new reporting discretion resulting from the decrease in book-tax conformity is actually exploited despite additional requirements to document deviations between financial and tax accounting. Using individual financial and tax accounts allows us to attribute a change in book-tax differences to tax sheltering rather than to financial earnings management, as there tends to be no capital market relevance of individual accounts. Secondly, we examine how the change in book-tax conformity affects the persistence of taxable and financial income. This analysis provides an additional test that the newly introduced scope for opportunistic reporting behavior induces tax sheltering rather than earnings management. Moreover, we are thereby able to illustrate the interaction between book-tax conformity, book-tax differences and earnings quality.

Graphical analysis illustrates that the total book-tax income difference becomes positive (i.e. financial income exceeds taxable income) in the fiscal year 2010 which indicates

opportunistic tax reporting behavior. The same applies to income differences relating to Property, Plant and Equipment (PPE). We interpret this as an indication that companies make beneficial use of deprecation options in order to decrease taxable income.

In the empirical analysis, we directly exploit the 2010 reform in a difference-in-differences regression approach. Our results suggest that companies do indeed use the newly introduced discretionary reporting scope. More precisely, we find that profitable companies which face a clear tax sheltering incentive exhibit comparably higher book-tax differences subsequent to the decrease in conformity. We particularly trace this effect back to book-tax differences relating to PPE and thus to companies making use of favorable tax depreciation rules. Furthermore, we find that small firms featuring less complex and predominantly national group structures are more likely to engage in opportunistic tax reporting behavior.

With respect to the persistence of taxable and financial income, our results suggest that a decrease in book-tax conformity leads to a decline in the persistence of taxable income which we attribute to the distortive impact of the newly arisen tax sheltering options. In contrast to that, we observe an increase in the persistence of financial accounting earnings. This supports our hypothesis that the detected increase in book-tax differences (BTD) is driven by downward management of taxable income and not by upward managing of financial income.

In terms of policy contribution, our results inform the debate on the effects of book-tax conformity with valuable findings from a quasi-experimental setting. In particular, we show that a switch from high to low conformity creates discretion for opportunistic reporting which is exploited for tax sheltering despite higher documentation costs. This finding speaks against a shift towards a two-book system. At the same time, we show that detaching financial and taxable income increases the persistence of financial income, thus suggesting an increased information content of financial earnings in a two-book system. This is reasonable, since financial reporting numbers are no longer influenced by tax reporting objectives and there are no incentives for earnings management in individual financial statements. Essentially, the reduced persistence of post-reform taxable income, however, indicates that earnings quality will deteriorate in a two-book system if incentives for opportunistic behavior are present. Hence, we conclude that a switch from high to low conformity increases opportunistic reporting behavior while not improving

the information content with regard to those reported income numbers for which incentives for opportunistic behavior are present.

The paper continues as follows: Chapter 3.2 discusses the related studies on the effects of book-tax conformity and outlines how our study contributes to this strand of literature. Chapter 3.3 provides an overview of the German institutional setting and of the change in book-tax conformity induced by the BilMoG-Reform Act. We describe our dataset in chapter 3.4. Chapter 3.5 presents the descriptive and graphical analysis of book-tax income differences. Chapter 3.6 describes the empirical approach including hypothesis development and discusses the results. Subchapter 3.6.1 refers to the analysis of a change in book-tax conformity on the book-tax income gap and tax sheltering whereas in Subchapter 3.6.2 we investigate the relationship between book-tax conformity and the persistence of taxable and financial income. Finally, chapter 3.7 concludes.

3.2 Related Literature

3.2.1 Pros and cons of book-tax conformity

In the last decade, the divergence of book and tax income in the US (Desai (2003, 2005); Mills et al. (2002); Plesko (2002); Manzon and Plesko (2002); Hanlon and Shevlin (2005)) and corporate reporting scandals such as the one concerning Enron, have led to an intense and ongoing debate as to whether or not financial accounting income and taxable income should be more strongly aligned. At the same time, however, several countries, including Germany, which traditionally have had a much higher degree of book-tax conformity than the US (Harris et al. (1994)), have recently moved towards a separation of financial and tax reporting. In Germany, this movement is aimed at achieving greater convergence with the International Financial Reporting Standards (IFRS) and at enhancing financial statement comparability (Deutscher Bundestag (2008)). Moreover, given the traditionally close link between financial and tax reporting in Germany, it seems reasonable to assume that delinking the two reporting lines is further motivated by the German legislator's aim to avoid the influence of an external standard setting board on tax law.

Proponents[114] (Desai (2003, 2005); Whitaker (2005); Shaviro (2009)) of increased book-tax conformity in particular point to managers' reduced scope for aggressively reporting on both financial profits and taxable income. On the one hand, inflating earnings would

[114] For extensive discussions on the pros and cons of increased book-tax conformity, see Hanlon and Shevlin (2005); McClelland and Mills (2007); Hanlon and Maydew (2009).

entail an increase in tax payments; on the other hand, understating taxable income would imply reporting lower profits to shareholders and other capital market participants. Hence, book-tax conformity would constitute an incentive not to report opportunistically in either direction, but instead encourage firms to disclose an unbiased earnings number more closely approximating their "true economic income". Thus, the quality of reported earnings would be enhanced and the firms' overall economic performance would become more transparent. Furthermore, the provision of one single set of rules could potentially lead to a reduction in compliance and administrative costs.

Opponents (Hanlon et al. (2005); Hanlon and Shevlin (2005); Hanlon et al. (2008); McClelland and Mills (2007)) of an increase in book-tax conformity, however, refer to the divergent objectives of both reporting lines (Hanlon and Heitzman (2010)) and invoke one major disadvantage of conforming book and taxable income: a loss of information contained in earnings in particular for capital markets and therefore a decrease of earnings quality (also see subchapter 3.2.4). That argument is based on the notion that accounting earnings are intended to inform about firm performance, whereas tax law is driven by governments' budgetary needs and other objectives. Moreover, Hanlon and Shevlin (2005) question the claim that conformity will actually reduce tax sheltering, reasoning that book income would most likely be conformed to tax income, thus creating strong incentives for tax competition.[115]

Empirically, due to the lack of fundamental reforms of book-tax conformity, there is little direct evidence of the impact of changes in conformity on reporting behavior. As Hanlon and Heitzman (2010) point out, in "examining what would happen here in the U.S. if book-tax conformity were adopted, the ideal research design cannot be employed since the U.S. has not switched from a full book-tax conformity system to a non-conformed system (or vice versa)". They, therefore, underline the potential of using systematic changes in book-tax conformity for further investigating reporting behavior before and after a change. The few existing papers based on US data address contexts in which book-tax conformity changed partially.

[115] Hanlon and Shevlin's argument goes as follows: If book and tax income were to be conformed, it would be more likely that financial accounting income is conformed to taxable income, as Congress would probably not be willing to leave tax revenue determination to the Financial Accounting Standards Boards. If that held true, market participants would know that the reported earnings are those on which tax is computed and would no longer rely on it as strongly as a source of information about firm performance. Hence, if it was clear that capital market participants do not any longer interpret earnings as performance measure anyway, firms would face an incentive to understate earnings in order to keep taxes low.

One example is Dhaliwal and Wang (1992) who examine whether the book income adjustment, which became part of the annual minimum tax (AMT) system in 1987, alters financial reporting behavior. They find that the book income adjustment, according to which half of the difference between book and taxable income has to be included in the AMT tax base, prompts firms that are likely to be affected by the adjustment to shift income across years in order to reduce the AMT burden. In addition, Guenther et al. (1997) examine the financial reporting behavior of large, publicly traded firms that, following the enactment of the 1986 Tax Reform Act in the US, became subject to an increase in book-tax conformity due to a switch from the cash method to the accrual accounting method for tax purposes. They conclude that a stronger alignment of financial and tax reporting induced affected firms to defer financial accounting income.[116]

In contrast to this setting of increasing conformity, Chan et al. (2010) examine the case of a decrease in book-tax conformity in China. More specifically, Chan et al. (2010) assess whether a change of the financial reporting system from tax-based financial accounting towards the IFRS affects the informativeness of book-tax differences for tax non-compliance, i.e. the violation of tax rules. Indeed, they find that a decrease in conformity increases fraudulent tax reporting. In a further study exploiting the decrease in conformity in China, Chan et al. (2013) conclude that when book-tax conformity is reduced, larger firms pay proportionately less tax than smaller firms, i.e. they have greater ability to exploit the scope in independent tax reporting and thus save on tax payments.

Apart from the paucity of exploitable institutional changes, only few papers are based on actual tax return data which is usually not available to the public. Examples of such studies building on tax return data include Lisowsky (2009), Mills (1996), Mills and Newberry (2001), Mills et al. (2002), Plesko (2007) and Chan et al. (2010). However, the majority of empirical investigations rely on proxies for tax positions estimated from financial statements. For instance, in order to estimate taxable income, the current tax expense on the income statement is commonly grossed-up by the statutory tax rate. As Hanlon (2003) points out, this approach may, however, be subject to several estimation problems, as current tax expense and actual tax liability on the tax return usually do not correspond. Hanlon argues that additional disclosures would be necessary to more accurately determine taxable income from financial statements.

[116] Hanlon et al. (2008) build on this natural experiment as well. For more details, see 2.4.

3.2.2 Impact of book-tax conformity and book-tax differences on tax sheltering and earnings management

Book-tax differences relate to deterministic, legal differences between accounting standards and tax law and/or to discretionary differences attributable to incentives inherent in financial and tax reporting (Mills et al. (2002)). Various studies assess how (estimated) book-tax differences relate to aggressive tax reporting (e.g. Mills (1996, 1998); Manzon and Plesko (2002); Desai (2003); Desai and Dharmapala (2006)), whereas other papers (e.g. Philips et al. (2003); Lev and Nissim (2004); Hanlon et al. (2009)) attribute large book-tax differences to earnings management.[117] Still other studies aim to consider both, earnings management and tax sheltering (Ayers et al. (2009); Blaylock et al. (2012); Seidman (2010)). In that regard, Badertscher et al. (2009) and Frank et al. (2009) find that some firms indeed report high book income to investors and low taxable income to tax authorities if both lines of reporting are not conformed. The question as to whether book-tax conformity leads to more or to less opportunistic reporting behavior remains, however, somewhat unclarified: Watrin, et al. (2014) construct an index to capture international differences in book-tax conformity and conclude that firms operating in one-book systems (less scope for discretionary book-tax differences) conduct significantly more (upward) earnings management in their consolidated financial statements than firms which operate in an environment of low book-tax conformity. In line with these findings, Blaylock et al. (2015) conclude that book-tax conformity is associated with significantly more, not less, earnings management. By contrast, recent evidence by Tang (2015) suggests that high book-tax conformity deters overall earnings management and tax avoidance. This fits in with Coppens and Peek (2005) who establish that private firms in high conformity countries are less likely to engage in earnings management. Likewise, Salbador and Vendrzyk (2012) identify periods with differing levels of conformity across the years 1956 to 2010 and demonstrate that earnings management is more prevalent in low conformity periods.

3.2.3 Firm level determinants on book-tax differences

Additional studies investigate the extent to which book-tax differences and/or opportunistic reporting activities can be explained on the basis of particular company characteristics. Mills and Newberry (2001) find that public firms tend to exhibit larger book-tax differences than private firms and that these differences tend to be more positive

[117] See Dechow et al. (2010) for a broad review of the earnings management literature.

for firms with larger profitability and more negative for unprofitable firms. Similarly, Mills et al. (2002) conclude that profitable firms and firms with multinational operations exhibit larger book-tax income differences. They also find that the most significant increase in the gap between book and taxable income has occurred in the financial industry. This is in line with Plesko's (2002) finding that book-tax differences are greater in the financial and information industries. In addition, Manzon and Plesko (2002) demonstrate that book-tax differences can be determined by the change in firm sales and the level of PPE.

Finally, on the basis of confidential tax return data sourced from the Internal Revenue Service, Lisowsky (2010) develops a model to infer the likelihood that a firm engages in tax sheltering. Amongst other things, his results indicate that this likelihood positively correlates with firm profitability and size, but shows negative correlation with leverage.

3.2.4 The impact of book-tax conformity or book-tax differences on earnings quality

Related to the issue of opportunistic reporting, a further strand of literature examines the association between book-tax conformity, book-tax differences and particular properties of (financial accounting) earnings quality, such as the persistence or value relevance of earnings. Studying earnings persistence as a feature of earnings quality builds on the notion that – if not reported opportunistically and thus truthfully reflecting the companies' economic condition – earnings should have explanatory power with regard to future profits. Similarly, value relevance refers to the ability of disclosed earnings to capture firm value as reflected in stock market returns.

Hanlon (2005) posits that large book-tax differences, as opposed to small book-tax differences, are indicative of less persistent earnings. More specifically, Blaylock et al. (2012) show that firms with large positive book-tax differences, which can be attributed to upward earnings management, have lower earnings persistence than other firms with large positive book-tax differences.

In addition, Hanlon et al. (2008), building on the natural experiment first exploited by Guenther et al. (1997) (see chapter 3.2.1), find that an increase in conformity causes earnings to be less informative compared to earnings of firms that were not subject to the change in conformity. The authors argue that increased conformity deters earnings quality because rather than reflecting economically valuable information, earnings are reported

in a way that minimizes taxes. This is in contrast to Desai's (2005) suggestion that increased conformity can improve earnings quality by limiting earnings management.

Atwood et al. (2010) study the relationship between book-tax conformity and earnings persistence based on an index capturing the degree of book-tax conformity in various countries. Their evidence also suggests that earnings are less persistent in countries with high book-tax conformity. However, unlike these papers, Hung (2001) and Leuz et al. (2003) do not find any effect of book-tax conformity with regards to differences in the properties of earnings in their cross-country studies. In particular, this is somewhat confusing with regard to evidence building on indices for book-tax conformity such as the one by Atwood et al. (2010)[118], Watrin et al. (2014) and Tang (2015) which are based (directly or indirectly) on book-tax differences.

To sum up, existing empirical studies entail two major shortcomings: First, most papers - in absence of tax return data - use proxies for tax positions from financial statements which may be subject to several estimation problems. Second, only few studies observe an institutional change and can therefore demonstrate possible behavioral responses to changes in conformity. Essentially, we are able to overcome these concerns in our study. With regard to the research questions addressed, we shed new light on the impact of a change in book-tax conformity on reporting behavior in terms of tax sheltering. Moreover, we illustrate the interaction between book-tax conformity, book-tax differences and earnings quality.

3.3 Institutional Background

3.3.1 Changes in the level of book-tax conformity in Germany

The Accounting Law Modernization Act (*Bilanzrechtsmodernisierungsgesetz (BilMoG*)), which entered into force in 2010, weakened the strong linkage between financial and tax accounts in Germany. It can thus be considered as having induced a transition from a rather strict one-book system to a more two-book oriented system.

Germany has traditionally been a high book-tax conformity country with one of the closest relationships between financial and tax accounting worldwide (Schön (2005b); Lamb et al. (1998)). In this regard, the authoritative principle (*Maßgeblichkeitsprinzip*

[118] Atwood et al. (2010) argue that book-tax differences are greater for firms that operate in countries with lower book-tax conformity. They suggest that those larger book-tax differences result in more unexplained cross-sectional variation in current tax expense. Therefore, they infer the degree of required conformity in a particular country from the amount of observed variation in current tax expense that cannot be explained by the variation in pre-tax earnings.

Sec. 5 (1) s. 1 EStG) has been one of the major reasons for the strong linkage between the determination of financial and taxable income. This principle implies that the recognition and measurement policies applied in individual financial accounting basically have to be incorporated into tax accounting. The reverse authoritative principle (*umgekehrte Maßgeblichkeit* (Sec. 5 (1) s. 2 EStG old version)) additionally stipulated that tax accounting options had to be exercised in accordance with financial accounting, i.e. if a firm made use of tax accounting advantages, the same values had to be recognized in financial accounts. If specific compulsory tax regulations superseded financial accounting, e.g. due to the different objectives of financial and tax accounts, it was, however, possible for deviations between financial and tax accounts to occur. Table A- 2 in the Appendix provides an overview of the authoritative principle and such possible deviations in the Pre-BilMoG era.

Since the enactment of the reform, which abolished the reverse authoritative principle, it has been possible to exercise tax accounting options independently from the accounting treatment in individual financial statements. The changes in the authoritative principle induced by the BilMoG-Act are also listed in Table A- 2 (column "Post-BilMoG", marked in green).

The possibility of exercising tax accounting options independently comes along, however, with additional documentation requirements; namely the obligation to keep ongoing registers (Sec. 5 (1) s. 2 EStG) detailing the deviations between financial and tax accounts.

Overall, the adjustment of the authoritative principle by the BilMoG-Act has led to greater leeway for companies' decision-making when it comes to using tax accounting options advantageously without recognizing the same values in financial accounts. It is expected that this greater flexibility will lead to increased book-tax differences in Germany.

3.3.2 Book-tax differences before and after the BilMoG-Act

Balance sheet adjustments can generally be divided into deterministic and discretionary book-tax differences. While the former arise from different mandatory regulations under tax and financial accounts, the latter are not compulsory but may result from an independent use of tax and/or financial accounting options. Such differences may therefore reflect opportunistic reporting behavior, namely earnings management or tax sheltering. Table A- 3 in the Appendix provides an overview of accounting items with book-tax differences before and after the implementation of the BilMoG-Act under

German law. Prior to the implementation of the BilMoG-Act, the majority of book-tax differences were deterministic or discretionary due to financial accounting options. Subsequent to the introduction of the BilMoG-Act, however, tax accounting options can now be exercised independently and therefore opportunistically, thus creating more leeway for discretionary book-tax differences in terms of tax sheltering. New potential powers of discretion (see Table A- 3, marked in green) have emerged especially with respect to low-value assets, the valuation of inventories, the special item with reserve component[119] and most importantly depreciation rules (regular and exceptional). As tax accounting options can be used independently regarding these reporting items, taxable income can be managed downward without simultaneously decreasing financial income (Frank et al. (2009)). If managers make use of this new tax planning scope, it is expected that book-tax income differences will increase after the BilMoG-Act. Since the balance sheet adjustments described above are predominantly temporary in that they result from differences in the timing of income and expenses recognized under both accounting systems and should reverse at some point, the tax sheltering impact should be most prevalent directly after the introduction of the BilMoG-Act (2010) and diminish over time. [120]

In addition to these balance sheet adjustments, German tax law also enforces a number of permanent, mandatory off-balance sheet adjustments. These differences arise when a particular income or expense is accrued under tax accounting, but will never be recognized under financial accounting or vice versa. Examples are tax exempt dividend income according to Sec. 8b Corporate Income Tax Act (KStG), non-deductible expenses (Sec. 10 KStG) or investment allowances. The BilMoG-Act did not, however, change any regulations relevant to off-balance sheet adjustments, and therefore these are not a focus of our analysis.

3.4 Data and Sample Characteristics

We use a unique, anonymized linked sample of financial statements and tax return data for the years 2008 to 2012. Data was provided by Ernst & Young GmbH, Germany (EY). This is exceptional to the extent that tax return data is, in general, not publicly available

[119] German tax law grants, for example, a rollover relief for buildings (Sec. 6b EStG) or a replacement reserve under certain conditions (Sec. 6.6 EStR).

[120] In the US setting, there are more specific, permanent tax sheltering instruments (e.g. the valuation allowance, the tax contingency reserve, and the amount of foreign earnings designated as permanently reinvested) for which, however, no German equivalent exists. For more details see Hanlon and Heitzman (2010); Graham et al. (2012a).

in Germany. Although the Corporate income tax statistics contains micro level tax return data, this information is not published as a panel on a yearly basis and it is not possible to merge this tax data with financial statements or other firm characteristics. Our dataset, by contrast, comprises individual financial statements prepared under German Generally Accepted Accounting Principles (balance sheet, profit and loss statement) as well as tax balance sheets, tax reconciliations and tax declarations from tax returns. In addition, we requested that EY collect information regarding various firm characteristics, e.g. the firms' industry affiliation or previous reorganizations. As the sample entails the years 2008 to 2012, our panel covers both pre- and post-reform years.

Using tax return data linked with financial data enables us to compute actual book-tax balance sheet and book-tax income differences, rather than estimating these items on the basis of publicly available financial accounts. We can, therefore, overcome the discussed estimation problems and measurement errors and as such increase the power of statistical tests.

Unlike the majority of other studies, in particular those based on US data, which examine consolidated financial statements, we use single financial statements. We consider this approach appropriate for several reasons: First, taxable income is derived from individual accounts and the tax figure reported in consolidated accounts is aggregated from individual statements. It is thus straightforward to determine opportunistic tax reporting in individual accounts (Watrin et al. (2014)). Second, we can thus more clearly attribute changes in reporting behavior to tax sheltering, since earnings management that plays a role for listed firms and is more relevant for consolidated accounts should be less present in individual accounts due to lower capital market pressure. To further rule out that our conclusions on BTD are confounded by earnings management, we investigate the reform impact on the persistence of taxable and financial earnings. In short, we asked EY to select incorporated firms covering six different industries, three different size classes (the definition of size classes follows Sec. 267 of the German Commercial Code) and different postal code areas. Due to divergent reporting requirements, we excluded banks, insurances and other financial institutions. Table 10 provides an overview of the distribution of the sample with regard to these parameters. The comparison with the entire population of German corporations in the German Corporate Income Tax statistics shows that our sample is biased towards large firms and that the Manufacturing sector is overrepresented, whereas our sample comprises fewer firms from the Construction and Services industries. This distortion can also be found in large commercial datasets such

as Amadeus provided by Bureau van Dijk and is not unique to our sample of EY clients. It is most likely due to publication requirements. Furthermore, we cross-check our data by reference to the work of Watrin et al. (2014), who use a much broader dataset of European firms from the Amadeus database with a huge subset of German firms. They put forward a mean absolute value of approximated permanent book-tax differences of 0.0924 for Germany. If we replicate the construction of this proxy with our data, we obtain a similar value of 0.0859. This leaves us confident that the results of our study are not more systematically biased than studies based on broader commercial data sets.

Table 10: Sample distribution

Industry	**Sample**	**Population**	**Size** (Sec. 267 HGB)	**Sample**	**Population**	**Financial Ratios**	**Sample**	**Population**
	Frequency			**Frequency**			**Frequency**	
Manufacturing	30.46%	10.60%	Small	9.46%	51.80%	Tangibles to Assets	14.3%	22.6%
Construction	1.39%	9.40%	Medium	44.78%	33.39%	Debt to Assets	45.2%	45.4%
Trade	13.35%	16.70%	Large	45.76%	14.82%	EBIT to Assets	6.6%	3.8%
Service and others[121]	54.8%	63.30%						
Total	100%	100%	**Total**	100%	100%	**Total**	100%	100%

Note: This table characterizes the data sample and compares the relative coverage of size classes and industries to the population of German corporations (Corporate income tax statistics (2010), Corporate financial statement statistics (2009)).

The initial sample consists of approximately 150 unique incorporated firms. The number of observations per year varies slightly as we do not have data covering the entire sample period (five years: 2008-2012) for all firms (unbalanced panel). In total, our sample consists of 725 firm-year observations.

Our dataset enables us to identify deviations between financial and tax reporting at the level of single balance sheet items, both with respect to book-tax balance sheet and book-tax income differences. Book-tax balance sheet differences entail cumulative effects relating to accrual accounting decisions made in previous reporting periods. They do not, however, necessarily provide information on income differences relating to the current period. We therefore do not further analyze these positions. Book-tax income differences, by contrast, capture annual effects and can therefore be considered as a more suitable indicator for opportunistic reporting than balance sheet differences. In particular, they reflect how book income is adjusted in order to determine tax balance sheet income. Given that we are interested in differences between book and taxable income which relate

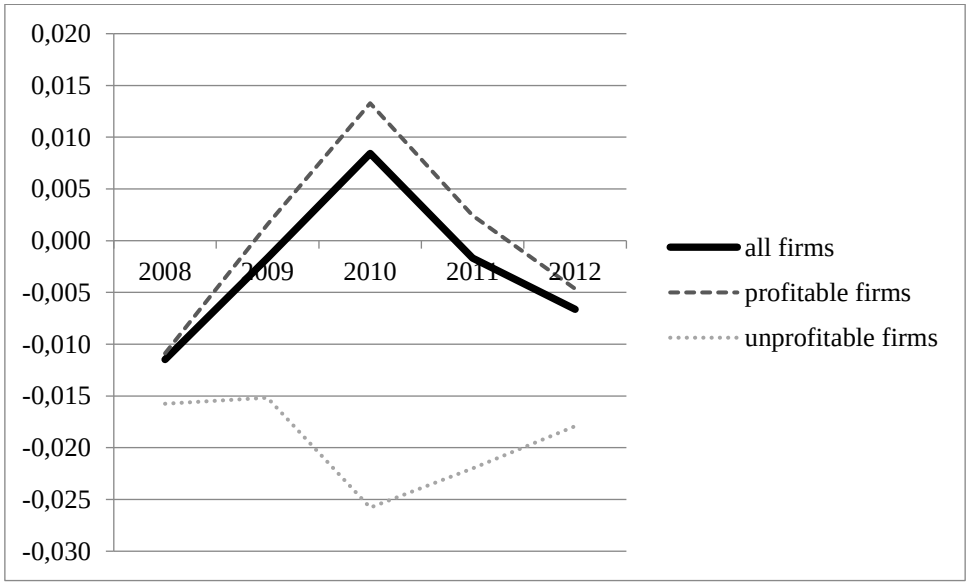
[121] From the six industry categories covered in our sample, this category also comprises firms from the Energy and IT sector. We condense industries this way to attain comparability with the Corporate income tax statistics.

to book-tax balance sheet differences, we do not, however, examine total book-tax income differences including off-balance sheet adjustments. As described in chapter 3.3, off-balance sheet adjustments are, in principle, deterministic and are not related to accrual accounting. We therefore consider them to be irrelevant for our analysis of opportunistic tax reporting. Any following uses of the term "taxable income" actually refer to tax balance sheet income before off-balance sheet adjustments.

3.5 Descriptive Evidence: Book-Tax Differences Pre- and Post-Reform

In Figure 2, we plot the total book-tax income difference scaled by total assets for the years 2008-2012. The solid black line represents the sample mean, the dashed black line depicts the average for profitable firms, and the dashed grey line the average for unprofitable firms. The book-tax difference turns positive if taxable income falls below financial income, thus potentially indicating aggressive tax reporting behavior. A negative book-tax difference, in turn, results if taxable income exceeds financial income.

Figure 2: Total book-tax income difference, scaled by total assets



Note: This figure shows the mean total book-tax difference (scaled by total assets) over the sample period. The solid black line represents the sample mean, the dashed black line depicts the average for profitable firms and the dashed grey line the average for unprofitable firms.

In the years 2008 and 2009, we observe negative book-tax differences. Strikingly, the overall book-tax difference becomes positive in the year 2010 when the implemented Reform Act introduced new reporting discretion. This suggests that the tax sheltering scope (i.e. to manage taxable income downward without simultaneously decreasing financial accounting) is in fact exploited. Since the newly introduced tax reporting discretion results in earlier recognition of tax expenses, the resulting timing effect

reverses over time. In line with this, we observe that, from 2011 onwards, total book-tax differences once again become negative.

Mills and Newberry (2001) posit that the incentive to decrease taxable income relative to book income depends on a firm's profitability. In fact, firms accruing losses are unable to benefit from (further) negative earnings adjustments. By contrast, they may report in a way that delays advantageous tax accounting to profitable periods. Accordingly, we partition our sample into profitable and loss-making firms in order to assess differences in reporting behavior.

As Figure 2 reveals, we indeed find quite opposite effects for the two types of firms. While profitable firms on average exhibit a positive book-tax difference in 2010 (book income exceeds tax income), loss-making firms accrue the largest negative difference in that year. In the subsequent years, the overall book-tax differences of profitable and unprofitable firms converge again.

To gain insights into the drivers of the observed effect, Table 11 displays book-tax income differences for single balance sheet positions separately. We again compare mean scaled book-tax differences over the pre-reform years to those of the post-reform years in order to disclose the changes induced by the change in conformity. For each balance sheet item, we additionally report the number of observations with non-zero values and whether the change of the book-tax differences is significantly different from zero (Table 11).

Table 11: Mean book-tax income differences, scaled by total assets, pre- and post-reform

	Pre-reform			*Post-reform*			
	#	Mean (%)	Standard deviation	#	Mean (%)	Standard deviation	p- value
Fixed assets							
Intangible assets	45	0.08	0.0174	72	0.03	0.0148	0.7041
PPE	74	-0.21	0.0280	137	0.15	0.0256	0.1089
Financial assets	83	0.93	0.0658	148	-0.37	0.0526	0.0089
Current assets							
Inventories	27	0.03	0.0087	40	0.03	0.0081	0.9464
Receivables and other assets	124	0.18	0.0259	217	0.00	0.0240	0.3752
Securities	5	-0.01	0.0011	7	0.00	0.0006	0.1352
Special item	7	0. 005	0.0005	15	0.012	0.0018	0.5985
Provisions	181	-0.42	0.0290	302	0.03	0.0287	0.07
Liabilities	75	-0.43	0.0385	155	0.24	0.0486	0.0804
Total number of observations: 580 (pre-reform: 225; post-reform: 355)							

Note: This table contains the number of observations with non-zero values, mean book-tax income differences and standard deviations for single balance sheet positions, separated for the pre- and post-reform period. In the last column, it is reported whether the change of the book-tax differences is significantly different from zero.

Most importantly, we find a negative mean income difference for PPE pre-reform, which becomes positive post-reform. The change in the book-tax income difference is almost significant at the 10% level.[122] An (untabulated) assessment of the development of PPE-related book-tax income differences over the sample period reveals that the observed total effect is mainly driven by a comparably large positive book-tax difference in 2010 which becomes slightly negative in 2011 before once again turning positive in 2012. Importantly, it should be noted that favorable declining balance tax depreciation was only available until 2010 in Germany. Hence, it seems reasonable to assume that the effect in 2011 would have been less negative if declining balance depreciation had still been available in that year. Overall, our findings for PPE suggest that companies do opportunistically make use of tax depreciation rules.

Turning to inventories as a further balance sheet item offering new reporting discretion, we find a positive average income difference both pre- and post-reform (Table 11). We do not, however, observe a significant change in the two values. Likewise, there is only a minor change observable for the special item with reserve component. We therefore abstract from these two balance sheet items in our further analysis.

The remaining balance sheet positions are predominantly driven by deterministic deviations. We find the largest mean scaled book-tax differences (both pre- and post-reform) for financial assets. More specifically, the difference pre-reform is positive, post-reform it is negative; the change in the difference is significant. We attribute this change to impairments, which are regulated more restrictively in tax accounting, i.e. non-permanent impairments may be recognized in financial accounting, whereas their recognition is forbidden in tax accounting. We observe a strongly negative pre-reform book-tax difference for provisions, which becomes positive and smaller in absolute terms post-reform. The same development is observed for liabilities. We find rather minor and insignificant effects for intangibles, receivables and securities.

To conclude, our descriptive analysis provides initial evidence that the discretionary scope in tax reporting, which arises from the decrease in book-tax conformity, is exercised. Furthermore, it suggests that deterministic differences are still material. Last, we acknowledge the fact that our sample period covers the financial crisis initiated in

[122] At this point, we again point to the relatively small sample size. Moreover, it must be kept in mind that the reporting scope is solely related to new investments. As we would expect a comparably low level of investments in 2010 as a result of the financial crisis, we believe that the observed effect would have be even more pronounced if 2010 had been a year of economic expansion.

2008. As Graham et al. (2012a) note, the nature of findings pertaining to the direction of the book-tax income gap greatly depends on whether a study is carried out for a period of economic expansion or contraction. As we would expect fewer companies to be profitable and to carry out new investments, thus facing the possibility and incentive to engage in opportunistic tax reporting, in the years subsequent to the crisis, we argue that our results tend to be conservative. In other words, we believe that our results would have been even more pronounced if the sample period had consistently been a period of economic expansion.

3.6 Empirical Analysis

3.6.1 Change of book-tax conformity, the book-tax income gap, and tax sheltering

The descriptive evidence indicates that companies seem to make use of the newly introduced discretionary reporting scope. The following empirical analysis exploits the reform scenario econometrically in a difference-in-differences setting to substantiate the analysis.

Hypothesis Development and Research Design

While the BilMoG-Act basically serves as a natural experiment in our research design, the reform, in general, affected all German corporations. Accordingly, we do not observe a natural control group (which is not affected by the reform at all) in our setting. The implied tax reporting leeway is, however, most probably only exercised by companies that have a clear incentive for tax sheltering (Chan et al. (2013), p. 7). Hence, profitable companies which can make efficient use of tax deductions are more likely to take advantage of opportunistic reporting opportunities (Manzon and Plesko (2002), p. 194; Wilson (2009), p. 985-987; Frank et al. (2009), p. 475). Loss-making companies, however, are expected not to face tax-related reporting incentives (Chan et al. (2010); Mills and Newberry (2001); Manzon and Plesko (2002)), as these companies do not pay any taxes in the current period. Furthermore, the tax benefits resulting from loss carry-forwards in future years are less certain (Mills and Newberry (2001), p. 4 f.). We therefore hypothesize the following:

H 1: Book-tax income differences will increase for companies with incentives to use the new reporting discretion (profitable companies) compared to companies with no/less incentives (loss companies) subsequent to the implementation of the BilMoG-Act.

In order to test our hypothesis and to examine the effect of a decrease in book-tax conformity on reporting behavior, we essentially use a difference-in-differences methodology. In the basic regression equation, we estimate

$$BTD_{i,t} = \alpha_0 + \alpha_1 Profitable_{i,t} + \alpha_2 Reform_t + \alpha_3 Profitable_{i,t} * Reform_t + \gamma X_{i,t} + \varepsilon_{i,t} \quad (6)$$

where *i* indexes firms and *t* indexes time. The dependent variable $BTD_{i,t}$ is defined as total book-tax income difference (balance-sheet differences) scaled by total assets. We compare outcomes before and after the reform for a group affected by the policy change (treatment) to a group not affected by the change (control). As only profitable companies have a clear incentive to use (and are therefore affected by) the new discretionary reporting scope, we take $Profitable_{i,t}$, a dummy variable which equals one for profitable firm-year observations (annual net income >= 0) and zero for firm-year observations with a loss (annual net income < 0), as treatment variable. Profitable firms accordingly serve as treatment group; loss firms as control group in our analysis. As long as treatment and control groups are affected by time-varying confounding variables in a similar way, the difference in the two estimates will reflect the effect of the BilMoG-Act. In this regard, untabulated t-test results reveal that the change in the book-tax differences from year 2008 to 2009 is not significantly different for profitable and loss-making companies, which points to a similar development of book-tax differences in the pre-reform period. Furthermore, as BTD do not impact on our measure of (financial income) profitability, we are confident not to face a reverse causality issue. As the profitability of companies and therefore the incentive for tax sheltering might change from year to year, we basically consider a mover panel.[123] We further include a dummy variable $Reform_t$ which equals zero for years before the BilMoG-Act (2008-2009) and one for years after the introduction of the BilMoG-Act (2010-2012). To ensure a comparable number of observations in the pre- and post-period, we restrict our main analysis to the years 2008-2011. The key interaction term of interest, $Profitable_{i,t}*Reform_t$, equals one for profitable firm-year observations starting in 2010, and zero otherwise. The coefficient α_3 represents the difference-in-differences estimator of introducing tax sheltering opportunities. Given that only companies with incentives are expected to make use of the new discretionary

[123] For a detailed description of difference-in-differences analysis for cross-sections, mover and no-mover panels see Lee and Kang (2006). Moreover, the number of loss-firms per year is rather constant over the sample period and seems, therefore, not to be systematically influenced by the financial crisis.

reporting scope, book-tax differences should comparatively increase in the treatment group subsequent to the implementation of the BilMoG-Act. We therefore expect α_3 to be positive ($\alpha_3 > 0$).

In addition, we include several firm-level control variables ($X_{i,t}$) which possibly influence the reporting gap. First, we add those balance sheet items for which new discretionary leeway is expected following the introduction of the BilMoG-Act: $PPE_{i,t}$ (PPE reported in financial statements scaled by total assets) and $Inventories_{i,t}$ (inventories reported in financial statements scaled by total assets).[124] In addition, we include variables for which general substantive (mainly deterministic) differences between tax and financial accounting regulations in Germany exist. Following the descriptive analysis, and in view of previous research findings,[125] we include $Financials_{i,t}$ (financial assets reported in financial statements scaled by total assets), $Provisions_{i,t}$ (provisions reported in financial statements scaled by total assets) as well as $Leverage_{i,t}$[126] (ratio of debt to equity capital). Furthermore, we add the dummy variable $Reorganization_{i,t}$ which equals one if the firm has been reorganized within the last five years and zero otherwise. The rationale behind this is that, according to the German Tax Reorganization Act (UmwStG)[127], book-tax conformity is not required in privileged reorganizations, which may further increase the book-tax income gap. Finally, we include two firm characteristic variables. These are $Size_{i,t}$ (natural logarithm of total assets reported in financial statements) and $Liquidity_{i,t}$ (ratio of current assets to accounts payable). The mentioned variables, in particular *Liquidity* and *Leverage*, are also intended to control for factors that potentially determine participation, i.e. the probability of a company being profitable or not in a given year, and shall therefore alleviate concerns about sample selection.

Table A- 4 in the Appendix provides descriptive statistics for our regression variables on a pooled basis as well as separated into data relating to the pre- and post-reform periods. The correlations among the explanatory variables (see correlation matrix in Table A- 5 in

[124] We ignore the special item with reserve component in our empirical analysis due to materiality reasons; the descriptive analysis has shown that only approx. 4% of firms in our sample recognize this balance sheet item. Furthermore, following the introduction of the BilMoG-Act, recognition is prohibited in financial accounts.

[125] See Zinn and Spengel (2012); Evers et al. (2014c).

[126] Leverage also constitutes a proxy for a firm's general capital structure (Chan et al. (2013)).

[127] For more details see Zinn and Spengel (2012), p. 17.

the Appendix) do not provide any indication of an unacceptable level of multicollinearity in the data.[128]

Results

Table 12 presents the results for regression equation (6).

Table 12: Regression results

	Dependent Variable: Book-tax income difference		
Variable	**Coefficient**	**t-statistic**	
Difference in Difference Design			
Reform	-0.052	-1.61	
	(0.032)		
Profitable	0.017	1.88	*
	(0.009)		
Profitable*Reform	**0.063**	**1.94**	*
	(0.032)		
Control Variables			
Variables for different tax and accounting rules			
PPE	-0.012	-0.63	
	(0.019)		
Inventories	0.018	0.35	
	(0.053)		
Financials	-0.000	-0.02	
	(0.017)		
Provisions	-0.015	-1.18	
	(0.013)		
Leverage	-0.000	-1.40	
	(0.000)		
Reorganization	-0.010	-0.90	
	(0.012)		
Variables for additional economic factors			
Size	-0.002	-0.55	
	(0.004)		
Liquidity	-0.000	-0.52	
	(0.000)		
Intercept	0.020	0.34	
	(0.059)		
Observations	n=436		
R^2	0.08		

Note: This table presents the regression results using OLS. The dependent variable is BTD (income) scaled by total assets. Robust standard errors are shown in parentheses below coefficients. *,**,*** represent significance levels at 10%, 5% and 1% respectively.

[128] According to Farrar and Glauber (1967) harmful levels of multicollinearity are not present until bivariate correlations exceed 0.8.

We obtain a positive and statistically significant coefficient estimate (α_3) for the interaction term (*Profitable*Reform*) in line with Hypothesis 1. This implies that the opening of new tax reporting scope significantly increased book-tax income differences for those companies that have a clear incentive for tax sheltering (profitable firms), relative to those companies without incentive (loss firms). They indeed seem to exploit the new discretionary reporting leeway to manage taxable income downward without simultaneously decreasing financial income. This finding is basically in line with Tang (2015), who also finds that high book-tax conformity generally deters tax sheltering.

To assess the robustness of this finding, we examine further specifications and conduct additional tests (Table 13). First, we run our Ordinary Least Squares (OLS) regression with clustered standard errors at firm level (column (1)) instead of heteroscedasticity-robust standard errors to control for a potential correlation of outcomes within the unit/firms.[129] To ensure that our results are not driven by differences between industries,[130] we include industry fixed effects in column (2). The basic result (α_3) remains unchanged in the specifications. The untabulated industry dummies are not significant. While we consider only financial income profitability as treatment criteria in our main specification, we use a different definition including off-balance sheet adjustments in column (3). The intuition behind this is the following: Off-balance sheet adjustments can mainly be seen as a fixed, non-manipulated component which has to be added to financial income anyway in order to end up at the taxable income. Therefore, a company is only facing a clear balance sheet-based tax sheltering incentive if its financial income plus off-balance sheet adjustments is positive. If, however, off-balance sheet adjustments already fully eat up financial profits, there might be no clear incentive to further reduce taxable income even if a company is considered profitable according to its profit and loss statement. The basic result (α_3 positive and statistically significant) again holds for the alternative treatment definition. In column (4), we expand our basic sample by adding fiscal year 2012, thus accepting that there is no more symmetry in the number of pre- and post-reform observations. Whereas the difference-in-differences coefficient (α_3) is still statistically significant and positive, its magnitude decreases. This is in line with the assumption that the tax sheltering impact should be most prevalent directly after the introduction of the BilMoG-Act (fiscal year 2010) and should diminish and level out over

[129] OLS standard errors might understate the standard deviation of the DiD estimator (Bertrand et al. (2004)).

[130] Mills et al. (2002) and Plesko (2002) find, for example, that book-tax differences are greater in the financial and information industries.

time due to the reversal effect of temporary book-tax differences. In line with this argumentation, we include the lagged dependent variable (BTD_{t-1}) as additional control in column (5) to test for a potential reversal effect.[131] In this case as well, the main result (α_3) remains basically unchanged. Finally, we conduct additional placebo difference-in-differences tests. In order to do so, we, first of all, define 2009 (the year previous to the introduction of the BilMoG-Act) as placebo reform year and run our basic regression (6) for the pre-reform period (years 2008-2009). Second, we use book-tax differences relating to provisions and liabilities as alternative outcome variables. These should not be affected by the intervention as related deviations are of deterministic nature and there has been no new reporting leeway with regard to these balance sheet items subsequent to the introduction of the BilMoG-Act. As expected, we do not determine a significant reform effect, i.e. an increase in book-tax differences for profitable companies in columns (6), (7) and (8) (α_3 not statistically and economically significant). This further demonstrates the validity of our findings. Moreover, the placebo reform year test (column (6)) further supports our common trend assumption.

[131] See Manzon and Plesko (2002), p. 198. Our panel is, therefore, restricted to the years 2009 to 2011 in this specification.

Table 13: Robustness tests

Dependent Variable: Book-tax income difference								
	(1) Clustered SE (firm level)	(2) Industry Fixed Effects	(3) Profitability incl. off	(4) Incl. 2012	(5) Lagged dependent variable	(6) Placebo Test: Reform Year 2009	(7) Placebo Test: Provisions	(8) Placebo Test: Liabilities
Reform	-0.052	-0.054 *	-0.033	-0.017	-0.039 *	-0.002	-0.001	0.006
	(0.035)	(0.033)	(0.021)	(0.015)	(0.022)	(0.015)	(0.006)	(0.008)
Profitable	0.017 **	0.019 **	0.016 *	0.016 *	0.011	0.015	0.004	0.003
	(0.009)	(0.009)	(0.009)	(0.008)	(0.013)	(0.011)	(0.005)	(0.008)
Profitable*Reform	**0.063 ***	**0.065 ****	**0.046 ****	**0.026 ***	**0.048 ****	**0.009**	**0.007**	**0.003**
	(0.035)	**(0.033)**	**(0.022)**	**(0.016)**	**(0.023)**	**(0.016)**	**(0.006)**	**(0.010)**
BTD_{t-1}					-0.157			
					(0.140)			
PPE	-0.012	-0.013	-0.016	-0.016	-0.022	-0.004		
	(0.018)	(0.019)	(0.020)	(0.017)	(0.026)	(0.018)		
Inventories	0.018	0.017	0.021	0.020	0.052	-0.019		
	(0.047)	(0.052)	(0.053)	(0.042)	(0.069)	(0.026)		
Financials	-0.000	-0.002	-0.003	-0.006	0.006	-0.009		
	(0.015)	(0.017)	(0.016)	(0.013)	(0.021)	(0.016)		
Provisions	-0.015	-0.018	-0.017	-0.024 **	-0.026 *	-0.005	-0.020**	
	(0.011)	(0.016)	(0.012)	(0.010)	(0.014)	(0.014)	(0.009)	
Leverage	-0.000 *	-0.000 *	-0.000 *	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Reorganization	-0.010	-0.011	-0.013	-0.012	-0.012	-0.003		
	(0.011)	(0.012)	(0.012)	(0.010)	(0.017)	(0.012)		
Size	-0.002	-0.002	-0.001	-0.001	-0.004	0.005 *	-0.000	-0.003
	(0.003)	(0.004)	(0.004)	(0.003)	(0.005)	(0.003)	(0.001)	(0.003)
Liquidity	-0.000	-0.000	-0.000	-0.000	-0.000 **	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Intercept	-0.020	-0.013	0.009	0.003	0.070	-0.099 **	0.002	0.042
	(0.041)	(0.068)	(0.059)	(0.048)	(0.078)	(0.047)	(0.014)	(0.057)
Observations	n=436	n=436	n=432	n=534	n=324	n=212	n=427	n=427
R^2	0.08	0.09	0.07	0.06	0.11	0.05	0.04	0.02

Note: This table presents the regression results using OLS. Dependent variables are total scaled BTD (income) (1-6) or scaled BTD (income) relating to provisions (7) or to liabilities (8) respectively. In column (1) standard errors are clustered at firm level. In column (2) industry fixed effects are additionally included. The treatment variable is defined as profitability including off-balance sheet adjustments in column (3). In column (4) the fiscal year 2012 is added to the sample. In column (5) the lagged dependent variable is included as additional

control variable. In column (6) fiscal year 2009 is defined as placebo reform year. Robust standard errors are shown in parentheses below coefficients. *,**,*** represent significance levels at 10%, 5% and 1% respectively.

Property, Plant and Equipment

As shown before, PPE is the most relevant balance sheet item with new discretionary reporting leeway subsequent to the introduction of the BilMoG-Act in Germany.[132] As depreciation schemes are generally recognized as one of the major instruments used for the management of taxable and book income in different directions and the descriptive analysis provides first evidence pointing into this direction as well, we rerun regression (6) with explicit focus on PPE. To that end, we use book-tax differences relating to PPE as alternative dependent variable and examine whether our finding also holds at single balance sheet level. We still control for the general level of PPE ($PPE_{t,i}$) in the regression and additionally include the dummy variable $PPE\_Growth_{t,i}$ which equals one if there has been a growth in the level of PPE ($PPE_{t,i} - PPE_{t-1,i} >= 0$) and zero otherwise. Given that the reporting and depreciation options can basically only be applied to new investments, this variable is intended to capture the actual tax sheltering possibilities of a company. Finally, we once again include the general economic controls described above: $Leverage_{t,i}$, $Size_{t,i}$ and $Liquidity_{t,i}$.

[132] For more details see chapter 3.3.

Table 14: Regression results - PPE

	Dependent Variable: Book-tax income difference (PPE)	
Variable	**Coefficient**	**t-statistic**
Difference in Difference Design		
Reform	-0.003	-1.17
	(0.003)	
Profitable	-0.006	-1.06
	(0.006)	
Profitable*Reform	**0.013**	**1.82 ***
	(0.007)	
Control Variables		
Variables for different tax and accounting rules		
PPE	-0.000	-0.00
	(0.008)	
PPE_Growth	0.006	1.54
	(0.004)	
Leverage	-0.000	-0.59
	(0.000)	
Variables for additional economic factors		
Size	-0.001	-0.92
	(0.001)	
Liquidity	0.000	0.21
	(0.000)	
Intercept	0.008	0.68
	(0.012)	
Observations	331	
R^2	0.02	

Note: This table presents the regression results using OLS. The dependent variable is BTD (income) relating to PPE scaled by total assets. Robust standard errors are shown in parentheses below coefficients. *,**,*** represent significance levels at 10%, 5% and 1% respectively.

In this case as well, we obtain a positive and statistically significant difference-in-differences estimate (α_3,Table 14). This makes us confident that our findings are especially attributable to companies opportunistically making use of tax depreciation rules.

Heterogeneous Reform Responses

The ability and incentive to report opportunistically may be heterogeneous across firms and depend on particular company characteristics.

First of all, the size of a company might be decisive. When it comes to the general association between firm size and tax sheltering or tax avoidance, the extant evidence is conflicting (Guenther et al. (1997), p. 242; Chan et al. (2013), p. 7). On the one hand, political power theory suggests that larger firms, because they have more resources

available for manipulating political processes in their favor, develop expertise and experience in tax planning and structure complex transactions to minimize tax liabilities, pay proportionally lower income taxes than smaller firms (Scholes et al. (1992); Siegfried (1972)). More precisely, given that the BilMoG-Act resulted in the implementation of new documentation requirements with respect to the independent exercise of tax accounting options, and these additional costs are expected to decrease with the size of the company (fixed-cost component to keep ongoing registers), larger companies may have relatively lower tax sheltering costs. As a result of this, these firms could be more likely to be able to make use of the increased scope for discretionary reporting. On the other hand, political cost theory posits that larger firms are subject to higher political costs; they face greater public and regulatory scrutiny and are therefore less tax aggressive than smaller firms (Boynton et al. (1992); Watts and Zimmermann (1978); Zimmermann (1983)). Furthermore, large companies are more likely to operate multinationally and therefore to have access to alternative, international tax planning and profit shifting channels. This could induce these large companies to focus less on tax sheltering based on discretionary scope in national tax reporting (Davies et al. (2014)). Considering these conflicting theories, we hypothesize the following:

H2: The new reporting discretion will be used differently by companies depending on their size. Book-tax differences of small companies will therefore develop significantly different compared to book-tax differences of large companies subsequent to the implementation of the BilMoG-Act.

In order to test this hypothesis, we run our basic regression equation (6) only for companies generally facing a tax sheltering incentive, i.e. profitable companies, and with different treatment groups:

$$BTD_{i,t} = \alpha_0 + \alpha_1 Treatment_i + \alpha_2 Reform_t + \alpha_3 Treatment_i * Reform_t + \gamma X_{i,t} + \varepsilon_{i,t} \quad (7)$$

First of all, we conduct a median split and take $Size_i$, a dummy variable which equals one if the size of a company lies below the median (total assets reported on financial statements as of 2009) and zero otherwise, as alternative treatment. Small firms accordingly serve as treatment group and large firms as control group in this specification. Given that small and large companies are expected to react differently to the new

reporting incentives, book-tax differences should develop systematically different in the treatment group subsequent to the implementation of the BilMoG-Act. We therefore expect α_3 to be significant, but are agnostic as to whether its sign is positive or negative ($\alpha_3 >< 0$). The control variables basically remain the same. Table 15 presents the results for regression equation (7).

Table 15: Regression results – Heterogeneous reform response

Dependent Variable: Book-tax income difference				
	(1) Size	(2) Subsidiaries	(3) Direct parent company	(4) Group parent company
Reform	0.000	-0.005	0.001	0.005
	(0.005)	(0.006)	(0.005)	(0.007)
Treatment	-0.010	-0.026***	-0.005	-0.017
	(0.009)	(0.010)	(0.009)	(0.011)
Treatment*Reform	**0.030 ***	**0.036****	**0.020**	**0.028**
	(0.015)	**(0.014)**	**(0.012)**	**(0.018)**
PPE	-0.007	0.009	0.000	0.006
	(0.015)	(0.013)	(0.018)	(0.019)
Inventories	0.029	0.036	0.033	0.039
	(0.056)	(0.056)	(0.058)	(0.061)
Financials	-0.006	0.007	0.005	0.005
	(0.012)	(0.017)	(0.019)	(0.019)
Provisions	-0.020	-0.015	-0.009	-0.012
	(0.015)	(0.012)	(0.013)	(0.012)
Leverage	-0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Reorganization	0.013	0.017**	0.018*	0.021**
	(0.008)	(0.008)	(0.010)	(0.010)
Size		-0.004	-0.004	-0.003
		(0.004)	(0.004)	(0.004)
Liquidity	-0.000	-0.000	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Intercept	-0.008	0.067	0.057	0.053
	(0.013)	(0.067)	(0.068)	(0.066)
Observations	n=353	n=345	n=322	n=304
R^2	0.04	0.05	0.04	0.04

Note: This table presents the regression results using OLS. The dependent variable is BTD (income) scaled by total assets. Treatment variables are defined as dummies capturing the size (1), existence of subsidiaries (2) or nationality of the direct (3) or group parent company (4) respectively. Robust standard errors are shown in parentheses below coefficients. *,**,*** represent significance levels at 10%, 5% and 1% respectively.

We obtain a positive and statistically significant coefficient estimate (α_3) for the interaction term (*Size*Reform*) in column (1) in line with Hypothesis 2, which we interpret as evidence for small companies exhibiting a systematic increase in book-tax differences compared to large companies subsequent to the reform. This implies that the new discretionary reporting scope has mainly been exploited by smaller companies. This

seems to be contrary to the findings of Lisowsky (2010) and Chan et al. (2013), indicating that large companies are more likely to engage in tax sheltering.

To further validate our conjecture that large companies focus less on tax sheltering based on national tax reporting because they operate multinationally and have access to other tax planning (profit shifting) channels, we examine three additional specifications (Table 15). In order to do so, we use alternative treatment variables acting as proxy for the complexity and internationality of a company. In specification (2), we take a dummy variable which equals one if a company owns no subsidiaries and zero otherwise (one or more subsidiaries) as treatment. In specifications (3) and (4), we define the treatment dummy as one if the direct parent or group parent company is domestic and as zero if it is foreign. All of these specifications aim at identifying significant differences with regard to tax sheltering behavior depending on a company's group structure. We indeed find a positive and statistically significant coefficient (α_3) in column (2), implying that the reform systematically increased book-tax differences for those companies without subsidiaries (less complex firms) relative to those with subsidiaries (more complex firms). Even if we do not obtain statistically significant positive difference-in-differences coefficients in columns (3) and (4), the p-values of 0.109 and 0.119 are still remarkable, indicating that companies with domestic parent companies (national groups) tend to engage more in tax sheltering than companies with foreign parents (multinational groups). All of these findings corroborate the conjecture that complex and multinational corporations are less likely to engage in tax sheltering based on discretionary scope in national tax reporting.

In conclusion, we provide evidence that companies with definite tax sheltering incentives (profitable companies) indeed exploit the new reporting discretion following the decrease in book-tax conformity. More precisely, our results show that companies are opportunistically making use of tax depreciation rules. Hence, in that regard, our results support the position of proponents of increased book-tax conformity. Additionally, we find that smaller companies featuring less complex and predominantly national group structures have a greater tendency to engage in opportunistic tax reporting behavior.

3.6.2 Change of book-tax conformity and the persistence of taxable and financial income

Using individual financial and tax statements instead of consolidated accounts, it is most likely that the identified change in book-tax differences (chapter 3.6.1) can be attributed

to tax sheltering and not earnings management, which rather occurs in consolidated accounts reported to the financial markets. To further rule out the influence of earnings management on the detected change in book-tax differences, we investigate whether the information content of reported taxable and financial income differs pre- and post-reform. The reasoning behind this is that increased tax sheltering is expected to deter the quality of reported taxable income while increased financial earnings management would deter the quality of reported financial income.

The persistence of earnings, i.e. the potential of predicting future earnings from current earnings, has been widely acknowledged in the literature as an appropriate measure of earnings quality (see chapter 3.2.4). We therefore proceed along the lines of these studies (e.g. Hanlon (2005)) to oppose financial and taxable income persistence pre- and post-reform.

Specifically, we are interested in the effect of the possibility to independently exercise tax accounting options on earnings quality (persistence of taxable income), given that there was virtually no possibility for tax sheltering before the BilMoG-Act. In a second step, we also consider the impact of changed conformity on financial accounting earnings persistence. Comparing the two outcomes provides further insights whether tax or financial accounts are managed opportunistically and thus are responsible for the observed increase in book-tax differences (see chapter 3.6.1).

In addition to that, we provide evidence on the interplay between book-tax conformity, book-tax differences and earnings persistence. To the best of our knowledge, we are the first to do so.

As regards the persistence of taxable income, we ex ante expect that the newly emerged possibility for tax sheltering deters the information content of current taxable profits for one year ahead taxable profits. By contrast, given that earnings management is considered to be irrelevant in individual financial accounts and in light of the fact that financial accounting is less influenced by tax law subsequent to the BilMoG-Act, we expect no change or even an increase in the persistence of financial income as a consequence of the change in conformity. We therefore frame our third hypothesis as follows:

H 3: The decrease in book-tax conformity arising from the implementation of the BilMoG-Act in Germany causes a decrease in the persistence of taxable income as a result of increased tax sheltering activity. By contrast, the persistence of financial accounting earnings remains unchanged or even improves.

Research design

We separately test for changes in the persistence of taxable income and financial accounting earnings. In doing so, we build on Hanlon (2005) and estimate for each income type the following OLS regression model for all firm-year observations:

$$EARN_{i,t+1} = \beta_0 + \beta_1 EARN_{i,t} + \beta_2 BTD_{i,t} + \beta_3 EARN_{i,t} * BTD_{i,t} + \beta_4 Profitable_{i,t} + \beta_5 EARN_{i,t} * Profitable_{i,t} + \varepsilon_{i,t} \quad (8)$$

$EARN_{i,t}$ denotes either taxable income or financial accounting earnings. Essentially, equation (8) estimates one-year ahead earnings (scaled by total assets), $EARN_{i,t+1}$ as a function of current period's earnings (scaled by total assets) $EARN_{i,t}$ in order to assess the general level of earnings persistence.[133] In addition, we include $BTD_{i,t}$, which is the absolute amount of the total book-tax income difference. Both variables are centered, i.e. the mean is subtracted from the predictors before fitting the regression model in order to increase interpretability. Additionally, we add the interaction of $EARN_{i,t} * BTD_{i,t}$ in order to allow persistence to vary across different levels of book-tax differences. In this regard, a negative and significant coefficient of the interaction term would, for example, suggest that earnings persistence is lower where total book-tax differences are larger. We also incorporate $Profitable_{i,t}$, a dummy variable indicating whether annual net income is positive (1) or not (0) as well as the interaction term $EARN_{i,t} * Profitable_{i,t}$ in order to account for the possibility that – in line with our analysis in 3.6.1 – incentives and observed effects may be different for profitable and loss firms.[134] Finally, we include year-fixed effects.

We conduct a sample split to run estimation (8) for pre- and post-reform years separately. The idea is to compare the sign, size and significance levels, particularly of our major variables of interest. These are $EARN_{i,t}$, used to determine whether the general level of persistence is altered by a change in book-tax conformity, and $EARN_{i,t} * BTD_{i,t}$, used to provide answers to the question as to whether, depending on the degree of conformity, higher absolute book-tax differences are associated with a comparatively increased or decreased persistence.

[133] Therefore, our panel is restricted to the years 2008 to 2011 in this model.
[134] For a similar approach see Atwood et al. (2010).

Results

Table 16 presents the regression results of equation (8) for the persistence of taxable income.

Table 16: Regression results: Change of book-tax conformity and taxable income persistence

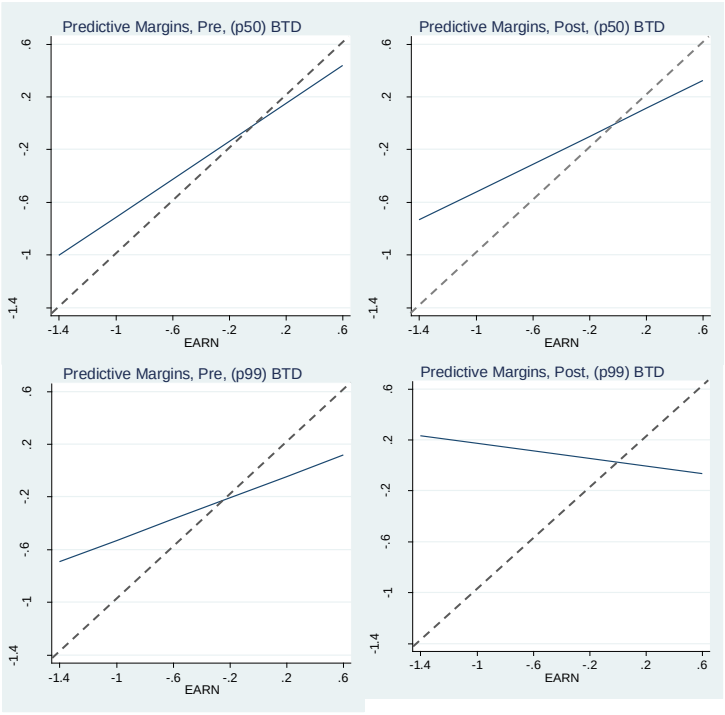
	Pre-reform (2008-2009)			**Post-reform (2010-2011)**		
Variable	**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**	
$EARN_{i,t}$	0.710	13.70	***	0.501	4.02	***
	(0.052)			(0.125)		
$BTD_{i,t}$	-0.221	-2.83	***	0.032	0.47	
	(0.078)			(0.068)		
$EARN_{i,t} * BTD_{i,t}$	-0.532	-1.31		-1.127	-2.73	***
	(0.404)			(0.413)		
$Profitable_{i,t}$	0 .003	0.21		0.025	1.45	
	(0.016)			(0.018)		
$EARN_{i,t} * Profitable_{i,t}$	-0.660	-6.90	***	-0.036	-0.28	
	(0.096)			(0.131)		
Intercept	0.021	1.36		-0.013	-0.75	
	(0.015)			(0.017)		
Observations	n=273			n=271		
R^2	0.4948			0.1872		

Note: This table presents OLS regression results for the analysis of taxable income persistence. The dependent variable is one-year ahead taxable income scaled by total assets. Robust standard errors are shown in parentheses below coefficients. *,**,*** represent significance levels at 10%, 5% and 1% respectively.

We find a positive and significant coefficient for $EARN_{i,t}$ both pre- and post-reform, which can be interpreted as the general persistence level of a company with average BTD. However, the coefficient and the significance level decrease, accordingly pointing to a decline in tax persistence induced by the decrease in book-tax conformity. We interpret this as an additional hint for companies engaging in tax sheltering, which biases earnings and thus decreases their quality in terms of persistence. Beyond this, our data also allows more specific conclusions to be drawn regarding the impact of book-tax differences on persistence. In that regard, we observe a significant and negative coefficient of the interaction term (β_3), yet solely in the post-reform period.[135] We interpret this such that higher book-tax differences induce a further reduction in taxable income persistence when book-tax conformity is low.

[135] We do not find a direct impact of book-tax differences (β_2) in the post-reform period.

Figure 3: Marginsplot analysis for the 50th and 99th percentile of BTD, pre-vs. post-reform, Taxable income



Note: This figure shows graphical results (marginsplots) for the margins analysis of the interaction term $EARN_{i,t}$ * $BTD_{i,t}$ for the 50th and 99th percentile of BTD, separated for the pre- and post-reform period, with regard to taxable income. The dashed grey 45°-line serves as a reference indicating perfect persistence

Indeed, graphical margins analysis of the interaction term (see Figure 3) for selected percentile values of BTD shows that the association between current period's earnings and one-period ahead earnings decreases if one compares the pre- to the post-reform period. For very large BTD (99th percentile) this relationship even turns negative in the post-reform era.

We conduct the same analysis for the persistence of financial accounting earnings and present results in Table 17.

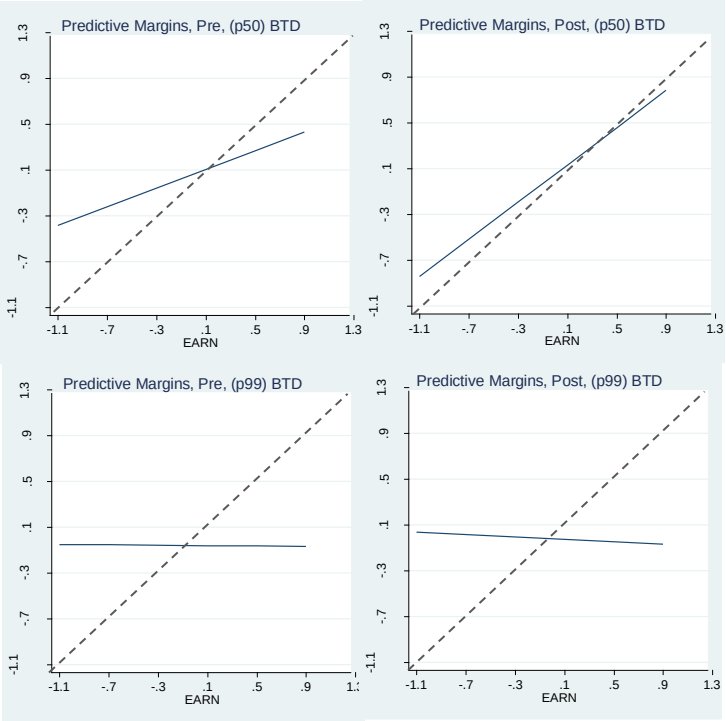
Table 17: Regression results: Change of book-tax conformity and financial income persistence

	Pre-reform (2008-2009)			Post-reform (2010-2011)		
Variable	**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**	
$EARN_{i,t}$	0.391	2.28	**	0.780	3.01	***
	(0.172)			(0.259)		
$BTD_{i,t}$	-0.211	-0.90		-0.126	-0.93	
	(0.234)			(0.136)		
$EARN_{i,t} * BTD_{i,t}$	-0.695	-2.28	**	-1.446	-7.48	***
	(0.305)			(0.193)		
$Profitable_{i,t}$	0.003	0.07		0.015	0.41	
	(0.040)			(0.037)		
$EARN_{i,t} * Profitable_{i,t}$	-0.078	-0.43		-0.118	-0.45	
	(0.183)			(0.263)		
Intercept	0.066	1.67	*	0.028	0.76	
	(0.039)			(0.037)		
Observations	n=247			n=247		
R^2	0.1297			0.5241		

Note: This table presents OLS regression results for the analysis of financial accounting earnings persistence. The dependent variable is one-year ahead financial income scaled by total assets. Robust standard errors are shown in parentheses below coefficients. *,**,*** represent significance levels at 10%, 5% and 1% respectively.

Again, we find a positive and significant coefficient for $EARN_{i,t}$ both pre- and post-reform. Unlike for taxable income, however, the magnitude of β_1 rises subsequent to the introduction of the BilMoG-Act. In principle, this insight indicates an increase in earnings persistence induced by a decrease in book-tax conformity which is in line with empirical evidence previously provided (Hanlon et al. (2008); Atwood et al. (2010)). Specifically for our setting, this observation makes us confident that the observed book-tax differences in 2010 indeed relate to tax sheltering, rather than to distortive earnings management which expectedly would negatively impact on earnings quality. We therefore conclude that the BilMoG-Act did not induce earnings management in single financial accounts. Moreover, the evidence of increased financial accounting quality is in line with book-tax conformity opponents' claim that the two reporting lines serve different information needs and that earnings quality is superior when the determination of earnings is not influenced by tax law. Indeed, before the enactment of the BilMoG-Act, the reverse authoritative principle caused such an impact of tax reporting on financial accounts (see chapter 3.3).

Figure 4: Marginsplot analysis for the 50th and 99th percentile of BTD, pre-vs. post-reform, Financial income



Note: This figure shows graphical results (marginsplots) for the margins analysis of the interaction term $EARN_{i,t}$ * $BTD_{i,t}$ for the 50th and 99th percentile of BTD, separated for the pre- and post-reform period, with regard to financial accounting earnings. The dashed grey 45°-line serves as a reference indicating perfect persistence.

As regards the general impact of book-tax differences, we do not find a direct impact of book-tax differences (β_2) on one-year ahead earnings, whereas we do observe a significant and negative coefficient of the interaction term (β_3). Once again we conclude that higher book-tax differences induce a reduction in earnings persistence. This is in line with Hanlon's (2005) finding and generally holds true for both pre- and post-BilMoG periods. This finding is also illustrated in the margins plot (Figure 4) which shows that - unlike in the case of taxable income – the general association between current and one-period ahead earnings improves pre- vs. post-reform. For the case of very large BTD (99th percentile) the association between current and one-period ahead earnings remains almost unaffected.

To sum up, we observe a general decline in the persistence of taxable income as a consequence of the change in conformity. We attribute this decline in the quality of taxable income as an alternative earnings and performance figure to the distortive impact of the newly arisen scope for tax sheltering. As such, this finding supports the position of proponents of increased book-tax conformity. By contrast, our evidence suggests that the decrease in book-tax conformity induces a general increase in the persistence of financial accounting earnings. We take this as an indication that there is no earnings management

in individual accounts and thus conclude that that the general quality (informativeness) of financial accounting earnings has increased.

3.7 Conclusion

Exploiting a quasi-natural experiment (the BilMoG-Act) in Germany and using a sample of linked individual financial statements and actual tax return data, we explicitly examine the effects of a change in book-tax conformity on reporting behavior.

We show that the new reporting leeway resulting from a transition from a one-book to a more two-book-oriented accounting system indeed seems to be used. In our descriptive analysis, this is reflected in a positive total book-tax difference and a positive book-tax difference relating to PPE, constituting the balance sheet item with the largest scope for tax sheltering, in year 2010. Based on a difference-in-differences design, we demonstrate that profitable companies - facing a clear tax sheltering incentive - exhibit comparably higher book-tax differences subsequent to the decrease in conformity. This can particularly be traced back to book-tax differences relating to PPE and thus to companies making use of favorable tax depreciation rules. Furthermore, we find that small firms featuring less complex and predominantly national group structures are more likely to engage in opportunistic tax reporting behavior. Overall, these results support the position of proponents of increased book-tax conformity.

We also examine how the change in book-tax conformity affects the persistence of taxable and financial income. Our results suggest that a decrease in book-tax conformity induces a decline in the persistence of taxable income which we attribute to the distortive impact of the newly arisen tax sheltering options. In contrast to this, we observe a higher persistence of financial accounting earnings, thus corroborating our finding that earnings management is not driving our results. This finding is also in line with the arguments put forward by the opponents of increased conformity, who maintain that both accounting lines provide divergent information content parts of which are lost in case of an alignment. Moreover, our results suggest that large book-tax differences have a negative impact on one-year-ahead (taxable and financial) income. This effect is, however, more pronounced in a context of decreased conformity and therefore yet another argument in favor of high conformity.

To sum up, we show that a switch from high to low book-tax conformity going along with accounting options creates room for opportunistic reporting which is indeed exploited for tax sheltering, despite higher documentation costs. This finding speaks against such a

shift towards a two-book system. At the same time, we show that detaching financial and taxable income increases the persistence of financial income, thus suggesting an increased information content of financial earnings in a two-book system. Essentially, the reduced persistence of taxable income post-reform, however, indicates that earnings quality deteriorates in a two-book system if incentives for opportunistic behavior are present. Hence, we conclude that a switch from high to low book-tax conformity increases opportunistic reporting behavior while not improving the information content with regard to those reported income numbers for which opportunistic reporting incentives are present.

4 Current Trends in Tax Accounting and Tax Reporting in Europe

4.1 Common Corporate Tax Base in the European Union: Concretization of the Principles for the Determination of Taxable Profit

4.1.1 Introduction

On 16 March 2011, the European Commission proposed a first draft directive (hereafter: DD) for a "Common Consolidated Corporate Tax Base (CCCTB)" (European Commission (2011)). This CCCTB Directive implies a three-step approach to harmonize corporate taxation in the European Union (EU). Firstly, the taxable income of every corporation is determined based on a harmonised set of rules. Secondly, taxable profits are consolidated at EU level. Afterwards, in a third step, the consolidated tax base is allocated to the group members located within the EU according to a predefined formula. The member states then apply their national tax rates to the profits assigned to them.

In the literature (Herzig and Kuhr (2011a), p. 2053; Kußmaul and Niehren (2011), p. 349; Spengel and Zöllkau (2012), p. 2; Hey (2012), p. 999; Kahle and Schulz (2013), p. 50) and in the political debate (BT-Drucks. 17/5606 of 28 April 2011; BT-Drucks. 17/5748 of 5 May 2011), the second and the third step of a CCCTB, consolidation and apportionment, are subject to controversial discussion. Therefore, the focus currently is on the first step, namely an EU-wide harmonisation of the tax base (Common Corporate Tax Base (CCTB)). In line with this, the Action Plan for a "Fairer and Efficient Corporate Tax System", published by the European Commission on 17 June 2015, envisaged a staged introduction of the CCCTB (European Commission (2015a)). On 25 October 2016, the European Commission also released a revised DD (hereafter: new DD) for a CC(C)TB, which explicitly includes a two-step procedure (European Commission (2016e, 2016f)). More precisely, they contemplate the first step consisting of a CCTB with cross-border loss offset while consolidation and formula apportionment are postponed to a later stage. Likewise, the Federal Ministry of Finance has lately estimated the impact of a CCTB on tax revenues in Germany. In this context, they also considered applying the harmonised profit determination provisions not only to corporations, but also to partnerships (Common Company Tax Base) (Oestreicher et al. (2014), p. 326 ff.).

A CCTB might certainly relate to the corresponding proposed regulations of the CCCTB Directive.[136] However, due to the frequent use of undefined legal terms, numerous regulatory gaps and room for interpretation still exist. One example is the recognition of provisions which is based on the criterion of the probability of a legal obligation; this legal term is, however, not explicitly defined in the CCCTB Directive. These uncertainties cannot be resolved by simply referring to national civil laws of the EU member states as they differ substantially and, thus, referring to them would not lead to a uniform application of the CCTB.

Based on this starting point, the main objective of this paper is to derive and concretize a proposal for a CCTB following a cash flow-oriented taxation/modified net income method which more strongly links tax accounting to the cash-principle. At the same time, we thereby aim at intensifying the debate on the CCCTB Directive.

First, chapter 4.1.2 provides an overview on the CCCTB Directive and outlines the arguments for a two-step procedure, namely to start with harmonising the determination of the tax base as in the case of a CCTB and to postpone further steps of consolidation as well as of formula apportionment. Chapter 4.1.3 explains and concretizes the determination of taxable profits in the framework of a cash flow-oriented taxation/modified net income method. Subsequently, chapter 4.1.4 compares this proposal with the corresponding rules of the CCCTB Directive. By doing so, we illustrate in how far recognition and measurement provisions would require further adjustments in order to create an effective CCTB. Chapter 4.1.5 encompasses a brief summary of the main findings of a quantitative comparison concerning the differences in effective tax burdens between taxable profit determination according to a cash flow-oriented taxation/modified net income method and according to the corresponding rules of the CCCTB Directive. Finally, chapter 4.1.6 concludes.

4.1.2 Draft Council Directive for a Common Consolidated Corporate Tax Base (CCCTB) in the EU

4.1.2.1 Overview

A CCCTB[137] should serve the purpose of eliminating existing inefficiencies and distortions that are related to cross-border taxation in the Single Market. The European

[136] See in detail Spengel and Zöllkau (2012).

[137] If not stated differently, the subsequent explanations and references to precise articles relate to the initial 2011 DD (European Commission (2011)) and not the revised version of 2016 (European Commission (2016e, 2016f)).

Commission particularly regards the coexistence of 28 different tax regimes as one of the major obstacles. These regimes may cause high administrative burdens and tax compliance costs as well as double taxation due to conflicting tax claims between Member States (European Commission (2011)).

The CCCTB aims at eliminating these obstacles to cross-border transactions and at harmonizing the corporate tax base in Europe. To that end, it proposes a three-step approach:

(1) Determination of corporate taxable income under a harmonized set of tax accounting regulations (Art. 9-43 DD);

(2) Consolidation of the individual corporate tax bases to a single tax base (Art. 54-60 DD);

(3) Allocation of the consolidated tax base to group members located in the different Member States by formula apportionment (Art. 86-104 DD).

Subsequently, member states impose a tax on corporations by applying their national tax rates to the share of consolidated profit apportioned to them. This approach explicitly does not aim at harmonizing tax rates, as fair competition regarding tax rates is intended (European Commission (2011)).

The benefits of a CCCTB are manifold. First, it reduces tax compliance costs of dealing with 28 different national tax systems. Second, it simplifies cross-border loss compensation and the deduction of costs of financing due to consolidation. Third, the elimination of intercompany profits and losses diminishes transfer pricing problems as well as conflicts in case of reorganisations and relocations of companies within the EU (Herzig (2010), p. 1061).

The personal scope of the DD only covers corporations. According to the 2011 DD, the CCCTB should be optional (Art. 6 DD), that is all corporations and permanent establishments of non-EU corporations which are located in the EU may opt for the CCCTB. This choice, however, can only be made jointly by an entire group (all-in all-out principle) and is binding for 5 years. The re-launched initiative by means of the 2016 DD, by contrast, lays down mandatory rules for groups above a certain size (Art. 2 new DD: consolidated group revenue exceeding EUR 750 000 000). In addition, the rules are still available, as an option, to entities which are subject to corporate tax in the EU, but do not meet the size criteria (European Commission (2016f)).

4.1.2.2 Recommendation: two-step procedure (CCTB instead of CCCTB)

If member states agreed to the DD, their tax systems would face far-reaching changes. It is, therefore, questionable whether all member states will give their consent.[138] Moreover, there still is a lack of clear and reliable impact assessments of a formula apportionment concerning the effects of a CCCTB on member states' tax revenues.[139] Other unresolved problems include, in particular, individual questions on consolidation and profit apportionment (apportionment factors and administrative aspects) as well as on transition (taxation of hidden reserves) and third country issues.[140]

Due to these still unresolved difficulties, a two-step procedure as a starting point for harmonising taxable profits in Europe is preferable. This stepwise strategy suggests just aligning the provisions for the determination of the corporate tax base (CCTB) in a first step. Consolidation and apportionment are only to be implemented in a second step at a later stage. In the literature (Herzig and Kuhr (2011a), p. 2053; Kußmaul and Niehren (2011), p. 349; Spengel and Zöllkau (2012), p. 2; Hey (2012), p. 999; Kahle and Schulz (2013), p. 50) and in the political debate (BT-Drucks. 17/5606 of 28 April 2011; BT-Drucks. 17/5748 of 5 May 2011) such a two-step procedure is largely supported. Lately, the European Commission also proposed a staged introduction of a CCCTB in its action plan (European Commission (2015a)) and came forward with a revised proposal for a CC(C)TB on 25 October 2016 which explicitly includes a two-step procedure (European Commission (2016e, 2016f)).

Even aligning profit determination provisions only might already remove some of the obstacles presented: for example, it would increase transparency and at the same time decrease compliance costs as well as the risk of double taxation in case of reorganisations (von Brocke (2008), p. 1012). Losses occurring in other member states could be determined according to uniform provisions. The co-existence of 28 parallel accounts would cease to be. In addition, Scheffler and Köstler (2014b) outline further advantages, for example concerning exit taxation issues and the cross-border loss compensation of foreign subsidiaries and permanent establishments. However, the DD would also need further specifications with regard to the provisions to determine taxable profits in order

[138] Amongst others Bulgaria, the Netherlands and Sweden critisized the DD's compliance with the principle of subsidiarity; other countries have also already criticized this, see von Brocke and Rottenmoser (2011), p. 623.

[139] For first results, see Fuest et al. (2007), p. 627; Devereux and Loretz (2008), p. 1; Bettendorf et al. (2010), p. 576 f.; Oestreicher and Koch (2011), p. 64. For an impact assessment of a Common Corporate Tax Base (CCTB) or a Common Company Tax Base see Oestreicher et al. (2014), p. 326 ff.

[140] For details, see Spengel and Zöllkau (2012), p. 11 ff.

to ensure a consistent application within the EU and, thus, real harmonisation. The following section addresses the background of this issue as well as possible solutions.

4.1.2.3 Determination of taxable profits according to a CCTB

The DD entails independent regulations on the determination of taxable profits, without explicit references to national or international financial accounting standards (e.g. IFRS). Thus, it can be considered to be an autonomous tax law. Its consistent interpretation in all member states would require the set of rules to be as complete and comprehensive as possible. To be more precise, its interpretation must be possible without referring to national or supranational law (Spengel and Malke (2008), p. 63).

The determination of taxable profits according to the 2011 DD[141] is based on a comparison of taxable income and deductible expenses (Art. 10 DD) and thus, on a profit and loss-oriented approach.[142] With regard to this, a non-exhaustive list of taxable income (Art. 4 par. 8 DD)[143] as well as of deductible expenses (Art. 12 DD) is prescribed.[144] Write-offs are additionally considered as other deductible items (Art. 13 DD).

The DD is not preceded by a general framework on profit determination from which answers to unresolved questions on recognition or measurement may be derived, but contains individual regulations. However, the determination of taxable profits refers to a few general basic principles (Art. 9 DD) that constitute the basis for calculating the tax base. They, in particular, include the realization principle (Art. 9 par. 1, 17 and 18 DD) as well as the principles of individual valuation and consistency.

Fundamentally, the proposed concept to determine taxable profits by the DD can be accepted, except for several matters of detail. In addition, it seems to be basically compatible with the tax systems of the member states.[145] Still there remain numerous regulatory gaps and room for interpretation that require further specifications. One of the underlying problems is that the DD frequently uses undefined legal terms for which it provides no point of reference and therefore, these need to be concretized by referring to national (civil) laws. For example, according to Art. 18 DD, the accrual of revenues (revenue recognition) is based on the criterion of legal enforceability (Kahle and Schulz (2013), p. 52). Similarly, provisions (Art. 25 DD) may only be recognized if the criterion

[141] For details, see Scheffler and Krebs (2011), p. 14* ff.; Spengel and Zöllkau (2012), p. 19 ff.
[142] Still for many items, tax values and their changes in the past year need to be calculated in an auxiliary calculation ("shadow accounting").
[143] For a list of tax-free income, see Art. 11 DD.
[144] For a list of non-deductible expenses, see Art. 14 DD.
[145] For details, see Spengel and Zöllkau (2012).

of probability of a legal obligation is fulfilled. The DD does not further specify these criteria and therefore, they would need to be interpreted based on the national (civil) law of the member states. However, this procedure bears the risk of different national interpretations from member state to member state. Thus, this would be counterproductive with regard to the goal of harmonisation (Herzig and Kuhr (2011a), p. 2058). Consequently, the DD needs to be adjusted in such a way that it enables greater disentanglement from national (civil) laws.

One possible approach to solution would be to focus more strongly on economic criteria. In that regard, Florstedt et al. (2015) argue that the economic substance of events and transactions could be explored as a guideline for harmonizing the application of a CCTB whenever terms or practices are undefined in the proposal. They evaluate the fundamental suitability of existing methods to determine the underlying substance, e.g. as included in the IFRS, especially with regard to the need for legal certainty. This analysis shows that a well-interpreted substance-over-form principle - in cases where legal form shapes economic substance - and particularly the so-called management- or business-model-approach - which is by definition independent from law - potentially provide an appropriate level of objectification.

Another possible approach (that will be pursued in the following) would be to gear the profit determination more strongly towards the cash-principle, as this would lead to more uniform and objective legal consequences and thus, largely reduce the scope of interpretation. The reason for this is that all countries principally treat cash in- and outflows the same way (in contrast to legal terms in national (civil) laws). Accrual accounting and periodical adjustments would not be disregarded completely but only applied as much as needed. In cases where accruals would still be necessary, legal terms and principles have to be specified as precisely as possible to make recurrence to national civil law obsolete. The idea of a cash flow-oriented taxation/modified net income method is not new (Schneider (1997) p. 273-285, 334-338; Kahle (2002), p. 186; Schreiber (2002), p. 108; Herzig (2004); Herzig and Hausen (2004), p. 1-10; Schneider (2004), p. 302-303)[146], it could, however, immensely contribute to further developing a suitable law on the determination of taxable profits in the member states.

[146] For an EU-wide harmonization of the determination of taxable profits, in particular, see Spengel (2003); Kahle and Schulz (2013).

4.1.3 Outline and assessment of a cash flow-oriented taxation/modified net income method

4.1.3.1 Features of a cash flow-oriented taxation and differentiation from a pure cash flow taxation

In case of a pure cash flow tax[147], the tax base is determined based on cash flow surpluses; that is the difference between incoming payments and (current and investment) expenditures. Consequently, investment expenses would be tax-free due to an immediate write-off (Jacobs and Spengel (1996), p. 112), which in turn would replace the periodic recognition of expenses due to regular depreciation. A cash flow tax is neutral towards investment and financing decisions and would, therefore, imply the absence of any economic distortions.[148] Moreover, it would entail other administrative advantages, as complex measurement and depreciation provisions would not be necessary anymore. At the same time, there would be disadvantages, on the one hand concerning (potential) negative effects on tax revenues (Jacobs and Spengel (1996), p. 116 f.), and on the other hand with respect to political acceptance, as the concept greatly differs from the current systems to determine taxable profits in the member states (McLure and Zodrow (1998), p. 2; Auerbach et al. (2010), p. 875).

In this light, one may consider a cash flow-oriented taxation/modified net income method (Herzig (2004); Herzig and Hausen (2004), p. 1-10; Hausen (2008); Schneider (1997), p. 273-285, 334-338; Kahle (2002), p. 186; Schreiber (2002), p. 108; Schneider (2004), p. 302-303). In contrast to a pure cash flow tax, this concept does not exclusively rely on payments, but also includes aspects of accrual accounting. Consequently, the realization principle is basically retained (e.g. still recognition of assets and consideration of depreciation); however, it is more closely oriented towards the payment date. This concept aims at circumventing problems of a pure cash flow taxation, in particular the randomness of the timing of payments as well as the related volatility of the tax base. Furthermore, its objective is to avoid manipulations which may occur due to a deliberate period shifting of payments in case of a pure cash flow tax (Herzig and Hausen (2004), p. 4 f.).

[147] The cash flow tax can be traced back to Brown (1948).
[148] Regarding the following, see Jacobs (2009), p. 116 ff. with further references.

4.1.3.2 Evaluation by reference to the objectives of tax accounting

If profit determination with a stronger cash flow orientation is taken as a starting point for a harmonized tax base within the EU, it needs to be in line with the general objectives of tax accounting.

The objective of tax accounting is to secure an equal treatment of different categories of income according to the ability to pay principle (Kirchhof (2002), p. 10).[149] The commonly accepted yardstick of the ability to pay principle is the income derived during one period. It is computed for all taxpayers according to uniform, objectified and non-arbitrary rules which are clearly and certainly defined in the tax code (Jacobs (1971), p. 24-27).[150] The decision to tax periodic income requires, at the same time, the acknowledgement of the realization, the nominal value and the net principles as corner stones for the determination of taxable profit (Herzig and Bär (2003), p. 7; Herzig (2005), p. 214-215; Homburg and Bolik (2005), p. 2335), which is already incorporated in the DD's principles. Moreover, the design of the tax base is embedded in the common economic requirements for tax systems, namely to improve investment conditions and to make locations more attractive for businesses (Sachverständigenrat (2003), no. 558 ff.). The DD is also shaped by these principles (European Commission (2011), p. 4 (Explanation)). On the one hand, this is linked to the call for allowing a loss set-off without any restrictions (either with regard to time or amount) (Jacobs et al. (2003), p. 524). On the other hand, broadening the tax base is compatible with these objectives if, at the same time, tax rates decrease (Oestreicher and Spengel (2003b), p. 936), as this reduces the effective tax burden which is crucial for location decisions (Devereux and Griffith (1998), p. 29; Haufler and Schjelderup (2000), p. 320; Becker et al. (2006), p. 741). Concurrently, interest and liquidity effects of profit determination are diminished (Oestreicher and Spengel (2003a), p. 85 ff.). The postulate of decision neutrality, however, does not provide specific provisions with regard to the determination of the tax base. Analogously, the ability to pay principle is by far too vague in order to deduce precise rules for the computation of taxable income. This problem already prevails for the clear definition of corporate income (Hennrichs (2001), p. 307-328; Treisch (2001), p. 316; Wagner (2002), p. 1888; Weber-Grellet (2002), p. 702). In particular, however, this relates to the dualism of income computation according to which income is either

[149] This idea can also be found in the theses of the so-called Bareis-Komission (1995) and the Brühler Empfehlungen (1999).

[150] In case of a stronger cash flow orientation, the ability to pay principle may be considered the ability to pay taxes from one's income, see Herzig (2004), p. 18.

computed as profits on an accrual basis or as the difference between receipts and expenses on a cash basis.

Different methods of income determination are not in accordance with the postulate of decision neutrality and the ability to pay principle. Thus, it has to be assessed whether income should be determined on an accrual basis or on a cash basis for all taxpayers. Nevertheless, it has to be noted that such a valuation always follows subjective rather than objective criteria. On the one hand, the accrual method does not suit all taxpayers because of reasons of simplicity and practicability. On the other hand, it is not possible to completely disregard accrual accounting in order to preserve capital (Schneider (1997), p. 263). Therefore, a feasible compromise could be to use the accrual method as a starting point but at the same time to limit periodical adjustments in accounting rules in order to provide for a stronger orientation towards cash flows and thus a greater convergence with the cash method. This would require a uniform solution that implies differentiation neither according to legal form nor to size. The stronger orientation on cash flows would lead to simplicity, practicability[151] and at the same time to objectivity and non-arbitrariness when determining taxable income.

4.1.3.3 Concretization and implementation issues

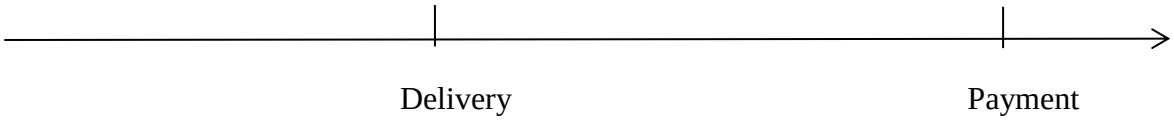
A stronger reliance on cash flows for the determination of taxable profits can only be achieved pragmatically. Objectivity and non-arbitrariness demand that the principle of individual valuation is respected, and moreover, that accounting options and reporting leeway/discretion are replaced through binding rules regarding the capitalisation of expenses and the valuation of assets and liabilities. An additional requirement consists in removing subsidized preferential tax treatments within tax accounting (e.g. special depreciations and non-taxable accruals) from the tax base (Scheffler (2001), p. 153). That way, only tax rate cuts or measures linked to the tax liability (e.g. grants, investment subsidies and tax credits) may be used in order to guide the economy as intended and to stimulate it.

The content and the scope of the realization principle are of significant importance for the timing of revenue recognition as well as for the recognition and measurement of assets. The realization principle may be retained as a core matching principle of accrual accounting. However, for reasons of objectivity and to avoid undefined legal terms, the

[151] The goal is to reduce control costs of financial authorities as well as declaration costs of taxpayers, see Kahle and Schulz (2013), p. 54.

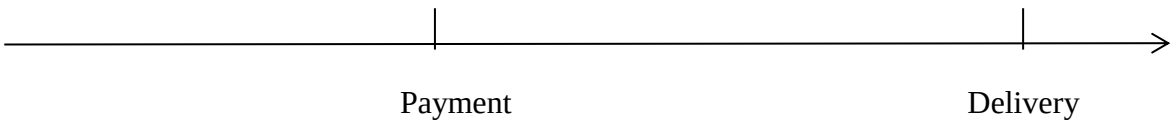
time of realization needs to be more closely linked to the payment date. We illustrate the consequences of a strict cash flow orientation with regard to revenue recognition by using the example "sale of goods". Here, the central question is when to realize the profit, in particular in cases where the payment date and the market transaction (delivery of goods) do not occur at the same time. The example demonstrates the potential consequences of a profit determination based exclusively on cash flows, i.e. a profit realization at the payment date.

a. Payment *after* delivery (Alternative 1)



Seller	No accounting entry	Cash (Debit) Sales revenue (Credit) Cost of goods sold expense (Debit) Inventories (Credit)
Buyer	No accounting entry	Merchandise (Debit) Cash (Credit)

b. Payment *prior to* delivery (Alternative 1)



Seller	Cash (Debit) Sales Revenue (Credit) Cost of goods sold expense (Debit) Inventories (Credit)	No accounting entry
Buyer	Merchandise (Debit) Cash (Credit)	No accounting entry

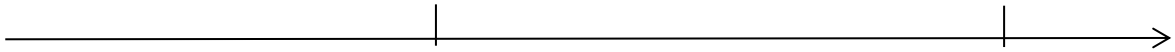
A point of criticism is that due to the strict cash flow orientation, profits may be realized or postponed as desired without being dependent on the actual market transaction.

Therefore, in order to prevent manipulation through the intentional shift of cash flows between periods, a strict cash flow orientation is not a feasible option. The reporting of income and expenses, and thus profits, rather requires that, in addition to cash in- and

outflows, the related market transactions have occurred.[152] Since, however, different countries may interpret and assess market transactions differently, it is necessary to define the time of transfer independently from national laws. Correspondingly, regulations could still make reference to legal terms, these, however, must not be undefined but clearly specified.

The IFRS may be a possible starting point (e.g. IAS 18.14: Criteria on the recognition of revenue from sales of goods) for this. They increasingly dominate international tax accounting law and can provide a catalogue of norms (Spengel (2004), p. 143 ff.). Moreover, the IFRS already played an important role in developing the DD (Commission of the European Communities (2003), p. 22). Specifications would need to explicitly become part of the set of rules and must not only be stated by making (dynamic) references to international accounting norms.[153] The following booking records illustrate the legal consequences linked to such an approach.

c. Payment *after* delivery (Alternative 2)



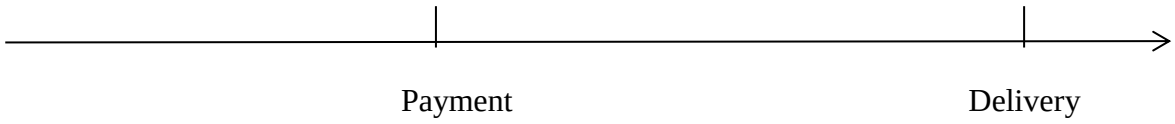
Delivery Payment

Seller	Receivables (Debit) Inventories (Credit)	Cash (Debit) Sales Revenue (Credit) Cost of goods sold expense (Debit) Receivables (Credit)
Buyer	Merchandise (Debit) Accounts payable (Credit)	Accounts payable (Debit) Cash (Credit)

[152] See also Schneider (1997), p. 280.

[153] See Spengel and Malke (2008), p. 88 ff. The European Court of Justice (ECJ) must have the exclusive interpretive competence for a CC(C)TB.

d. Payment *prior to* delivery (Alternative 2)[154]



Seller	Cash (Debit) Prepaid revenue (Credit)	Prepaid revenue (Debit) Sales Revenue (Credit) Cost of goods sold expense (Debit) Inventories (Credit)
Buyer	Prepaid expense (Debit) Cash (Credit)	Merchandise (Debit) Prepaid expense (Credit)

The example shows that the personal attribution of goods depends on the transfer of beneficial/economic ownership. Furthermore, it becomes apparent that payments prior to the time of delivery need to be neutralized as prepaid revenue by the seller until the market transaction occurs (Herzig and Hausen (2004), p. 8). Revenue is only recognized when the price risk of the goods is transferred to the buyer. The direct result of such a realization accounting is the capitalization of inventories, since expenses tied up in inventory such as costs of material have not yet resulted in a market transaction.

The concept of a stronger cash flow-oriented taxation also requires that assets and liabilities are recognized on the balance sheet. Here, it is decisive to define these terms clearly and independently of national laws. For example, the term asset could be based on the definition of the IFRS. Correspondingly, assets could be specified as resources controlled by the enterprise as a result of past events and from which future benefits are expected to flow to the enterprise (F. 49a). An exception for self-developed intangible assets would be necessary. The recognition of research and development costs on the tax balance sheet has always been subject to discussion, in particular due to its questionable tangibility (Schülke (2010), p. 992). Moreover, a prohibition to capitalize self-developed intangible assets and thus, a direct tax deduction of research and development expenses would provide an incentive for innovation. Promotion of research and development is also already included in the DD (Art. 12 DD).[155]

[154] In case of long-term production, partly revenue recognition according to the production stage may be considered.

[155] The new DD of 2016 also includes super-deductions for research and development costs (see Art. 9 par. 3 new DD).

The definition of liabilities or debt should be in correspondence with F. 49b and amongst others also include accounts payable. In contrast, one would need to refrain from the profit-effective approach with respect to sales-based receivables[156] and the recognition of provisions (except for some, see below) as well as of deferred items. Concerning deferred items, it might be possible to include exceptions for clear-cut or long-term issues (e.g. disagio (Herzig and Hausen (2004), p. 9-10), if uncommon on the market or accruals for more than five years) to limit the susceptibility to manipulation of a cash flow orientation.

However, the imparity principle, which becomes manifest in the anticipative consideration of losses through partial write-downs and provisions for contingent losses, should be renounced, as it impedes an equal treatment of different categories of income. Additionally, the principle of prudence serves the protection of creditors' interests which is only important for financial accounting but not for tax accounting (Weber-Grellet (1998), p. 1344). In order to guarantee that the treasury equally participates in losses and profits, the imparity principle as well as the limited possibility to form tax-free reserves (Kahle (2002), p. 186; Schreiber (2002), p. 109; Schneider (2004), p. 303; Kahle (2014), p. 17), which serve as 'loss buffer', for example, through the set-up of accrued liabilities can, in theory, only be abandoned if an unlimited interest bearing loss set-off is introduced at the same time. Thus, the improvement of tax loss set-off modalities is a key factor if the accrual method shall be restricted. If restrictions of the loss set-off remain, this will be inconsistent with the limitations of loss provisions within tax accounting; thus, the imparity principle and the principle of prudence would also have to be retained, at least partially.

The following example serves to illustrate the relationship between recognizing provisions and perfect loss compensation. We assume that a recultivation obligation with a settlement value of 120 Monetary Units (MU) in T = 0 has been incurred and is due at the beginning of period T = 4. Periodical surpluses are given and an interest of 10% is accrued; the tax rate amounts to 40%. Cash flows before taxes occur in such a way (Table 18) that periodic cash flows including investment returns just suffice to fulfil the recultivation obligation.

[156] Receivables are recognized with the acquisition and production costs until the receipt of payment (see example c)). See Schneider (1997), p. 280.

Table 18: Cash flow before taxes

	T = 1	T = 2	T = 3	T = 4
Cash flow before taxes	33.06	36.36	40.00	-120.00
Investment returns (10%)	-	3.31	7.27	-
Investment amount	-	33.06	72.73	120.00
Reinvestment	33.06	72.73	120.00	0.00

If we assume a tax rate of 40% and that a provision can be recognized, the consequences presented in Table 19 result. In this case, we presuppose an accumulation provision that is discounted at 10%.

Table 19: Cash flow after taxes, with provision

	T = 1	T = 2	T = 3	T = 4
Cash flow before taxes	33.06	36.36	40.00	-120.00
Investment returns (10%)	-	3.31	7.27	-
Investment amount	-	33.06	72.73	120.00
Allocation to provisions	33.06	39.67	47.27	-120.00
Amount of provisions	33.06	72.73	120.00	0.00
Profit	0.00	0.00	0.00	0.00
Tax (40%)	0.00	0.00	0.00	0.00
Reinvestment	33.06	72.73	120.00	0.00

Since no tax payments occur due to the recognition of provisions leading to expenses, periodic cash flows including investment returns suffice to fulfil the recultivation obligation. This only holds true under the assumption that it is allowed to create an accumulation provision at the amount of the settlement value.

In contrast, if we assume that recognizing provisions should be renounced, cash flow consequences (Table 20) strongly depend on whether a loss deduction is possible and whether it is interest-bearing.

Table 20: Cash flow after taxes, without provision

	T = 1	T = 2	T = 3	T = 4
Cash flow before taxes	33.06	36.36	40.00	-120.00
Investment returns (10%)	-	1.98	4.28	-
Investment amount	-	19.84	42.84	69.41
Profit	33.06	38.34	44.28	-120.00
Tax (40%)	-13.22	-15.34	-17.71	
a) No loss carry-back				0.00
b) Loss carry-back				48.00
c) Interest-bearing loss carry-back				50.59
Reinvestment financing deficit	19.84	42.84	69.41	
a)				**50.59**
b)				**2.59**
c)				**0.00**

It becomes apparent that if recognizing provisions is renounced and at the same time loss carry-backs are prohibited, a significant funding deficit occurs (50.59 MU = 120 MU – 69.41 MU). Even allowing a simple loss deduction of 48 MU (= 120 MU * 0.4) cannot eliminate this financing deficit completely (remaining financing deficit: 2.59 MU = 120 MU – 69.41 MU – 48 MU).[157] Only in case of a timely unlimited interest-bearing loss compensation, there are no disadvantages compared to recognizing provisions[158] such that the latter could be renounced. This precondition, however, is not fulfilled, as neither the DD nor common national law include such unlimited loss compensation rules. For example Germany, Sec. 10d EStG only grants a one-year loss carry-back as well as a timely unlimited loss carry-forward, and both of these are limited concerning the amount and are non-interest-bearing. The DD also only includes an unlimited loss carry-forward, but no (interest-bearing) loss carry-back (Art. 43 DD).

In case of a persistent limitation of tax-related loss offsetting, there are no sound arguments against periodization by means of provisions. This, in particular, concerns issues leading to tax-related losses, that can no longer be compensated for or are not deductible any more at the end of the total period (i.e. at the closure of a firm) and thus, are under the threat of being lost. Therefore, it would be necessary to allow for allocation

[157] We assume that other taxable profits were generated in T=1-3, that can be offset against the excess loss carryback of 4.32 MU (=120 MU – 33.06 MU – 38.34 MU – 44.28 MU).

[158] The advantage results from the interest on taxes paid beyond what is required, which in turn, are again subject to taxation. 2.59 MU = 1.67 MU (=13.22 MU *(1.1^2-1)*(1-0.4) + 0.92 MU (=15.34*(1.12-1)*(1-0.4))).

and accumulation provisions for tax purposes in case of long-term cumulative obligations like for example demolition, disposal, set-aside, recultivation and backfilling obligations. Additionally, the recognition of pension provisions should be allowed. To avoid the problem of undefined legal terms in the context of recognizing provisions, the set of rules would need to incorporate precise definitions and concretizations, e.g. on obligations coming into force from an economic or from a legal perspective, that again could be based on the IFRS.[159] Consequently, the point in time when a provision takes effect would need to be based on economic criteria that are interpreted uniformly in the entire EU. Short-term provisions for contingent liabilities (e.g. costs of vacation, guarantee and warranty claims or annual financial statement costs) should not be included in a cash flow-oriented profit determination, as they are materially less significant (Herzig and Hausen (2004), p. 8-9).

A cash flow-oriented profit determination also has effects on the valuation of assets and liabilities. Central valuation standards are historical acquisition costs and costs of production, respectively. To treat acquisition and production processes equally, and to ensure that the production process remains income-neutral until the time of the market transaction, production costs need to be based on full costs including overheads expenses. The acquisition and production costs of assets need to be depreciated straight-line over the economic useful life for reasons of objectivity. For reasons of simplicity and practicability, so-called pool depreciation could also be a potential option (Oestreicher and Spengel (2003b), p. 933-934). Accordingly, measurement is carried out according to amortized acquisition and production costs rather than fair values.[160] Permanent impairments due to economic or technical wear entitle to exceptional write-offs. The concept of a cash flow-oriented profit determination, however, does not encompass the imparity principle. According to this principle, risks and losses are already taken into account when they are anticipated at the reporting date but are not yet confirmed at the market.[161] For this reason, the concept of a cash flow-oriented profit determination does not allow exceptional depreciation relating to a mere reduction in value, which would result from the imparity principle.[162] For the valuation of inventories, simplifications (simplified measurement methods) need to be allowed for reasons of practicability

[159] According to IAS 37, provisions should be created if the event for which the provision is created is likely to occur (more likely than not) and if the amount of the provision can be estimated reliably.
[160] An exception could be made concerning financial instruments.
[161] For details on the imparity principle, see Leffson (1987), p. 339-426.
[162] For the differences between a regular depreciation and a current value depreciation, see e.g. Scheffler (2011), p. 249 f.

(Schneider (1997), p. 287-294). To avoid reporting leeway, it is necessary to prescribe a specific method and not to allow for any reporting options. The weighted average method shall be applied in this regard.[163] Provisions should be recognized at the present value of expenditures required to settle the obligation (based on IAS 37). For this purpose, a standardized interest rate should be set to limit potential fluctuations. Future increases in prices and costs should not be considered.

In general, we thus can conclude that the cash flow-oriented taxation/modified net income method is subject to a trade-off. In cases where, for reasons of objectivity, it is sensible to strictly rely on cash flows, no periodization/accrual accounting takes place. If mere cash flows lead to results that are unsatisfying and susceptible to manipulation, periodization is maintained (see e.g. prepaid expenses/revenue, inventories, long-term provisions). With respect to this, it is necessary to avoid undefined legal terms and to incorporate specific definitions and concretizations in the set of rules. These could definitely be based on the international accounting standards (Spengel and Oestreicher (1998); Spengel (2003), p. 34; Endres et al. (2007), p. 1079). In cases where the concept of a cash flow-oriented taxation/modified net income method does not state concrete rules (e.g. for depreciation), regulations should be based on the common state practice of the EU-28 (Spengel and Zöllkau (2012)) to enhance the political enforceability of the proposal.

In the following section, we compare the concept of a cash flow-oriented taxation/modified net income method to the rules of the CC(C)TB DD. We present in detail which rules of the proposed concept correspond to the rules of the DD and which of the DD's rules would need to be modified to comply with the concept of a cash flow-oriented taxation. This comparison will also illustrate in which areas there are undefined legal terms in the DD. We show how these can be defined in such a way that they can become part of the concept of a cash flow-oriented taxation/modified net income method (thereafter only: cash flow-oriented taxation). We compare the proposal of a cash flow-oriented taxation not only with the original DD of 16 March 2011 (first comparison level), but also with the compromise proposal of 14 October 2013 (P-LTU).[164] However, we only explicitly go into the second level of comparison, if the rules of the DD and the P-LTU differ.

[163] This method is the most widely spread in current state practice, see Spengel and Zöllkau (2012), p. 47.
[164] See Council of the European Union (2013).

Even if the recently published DD of 2016 (European Commission (2016e, 2016f))[165] has basically replaced the original DD of 2011 (European Commission (2011)), our subsequent analysis which focuses on the details of the 2011 DD and the P-LTU is, in principle, still valid. Although the two versions vary in some detailed regulations, the main difference lies in the explicit inclusion of the two-step procedure in the 2016 DD, which is also supported by our approach. In addition, the outlined main problem of undefined legal terms (see section 4.1.2.3) remains. Therefore, our key results as well as the derived actions for recommendation still hold.

4.1.4 Comparison of the proposal of a cash flow-oriented taxation/modified net income method and the Discussion Draft

4.1.4.1 Individual analysis

Recognition of revenue and expenditures

With respect to the concept of a cash flow-oriented taxation, "payment after the delivery of a good" and "payment before the delivery of a good" have to be distinguished regarding the time of revenue recognition. If a payment takes place after the good is delivered, revenue is only recognized at the time of payment. The resulting consequence is that at the time of delivery, the seller records receivables in an income-neutral way as the amount of acquisition and production costs of the good sold. If the price has already been paid before the good is delivered, revenue is only recognized when the price risk is transferred. At the time of payment, the seller records a prepaid revenue in an income neutral manner.

According to the DD, profits are recognised when they are realized (Art. 9 par. 1 DD). In accordance with the DD, this is the point in time at which the right to receive arises, i.e. when a receivable occurs, and the amount of revenue can be quantified with reasonable accuracy (Art. 18 DD). In case of payment after the good is delivered, revenue is already recognized at the time of transfer. If payments are made before the good is delivered, the seller needs to record a prepaid revenue income-neutrally. Revenue is only recognized once the sold good has been transferred.

In case of payment before delivery, the concept of a cash flow-oriented taxation and the DD are in accordance with one another. There are differences, however, if a payment takes place after delivery. If we were to follow the proposal of a cash flow-oriented

[165] The Allowance for growth and investment (AGI) (Art. 11 new DD) will not be considered in our analysis as it would constitute a step towards a consumption-oriented taxation and would not be compatible with income taxation.

taxation, the realization principle in Art. 18 DD would require adaption. The P-LTU expands and substantiates the accrual of revenues (Art. 18 P-LTU), but these changes do not move more towards the concept of a cash flow-oriented taxation.

According to the concept of a cash flow-oriented taxation, accounts payable as well as prepaid expenses are recorded income-neutrally, analogously to receivables and prepaid revenue. This income-neutral recording is possible through the recognition of assets in case of a purchase of goods. Expenditures for assets not subject to regular depreciation are recorded at the time of disposal. Expenditures for assets that can be depreciated regularly and for raw materials and supplies as well as goods are recorded at the time of consumption. The DD and the concept of a cash flow-oriented taxation equal each other concerning the recognition of expenditures.

Assets

According to the concept of a cash flow-oriented taxation, assets should encompass resources controlled by the enterprise as a result of past events and from which future benefits are expected to flow to the enterprise (F. 49a IFRS). As the DD does not provide a definition of the term asset, this definition could be incorporated into the DD.

According to the concept of a cash flow-oriented taxation, there should be a general obligation to recognize assets. Only for self-developed intangibles, this should be prohibited. In so far, this is in line with the DD.

Assets are attributed to their economic owner in accordance with the concept of a cash flow-oriented taxation and the DD (Art. 4 no. 20, Art. 34 par. 1, 3 DD). The economic owner is the person who has substantially all the benefits and risks attached to an asset, regardless of whether that person is the legal owner. A taxpayer who has the right to possess, use and dispose of a fixed asset and bears the risk of its loss or destruction shall in any event be considered the economic owner (Art. 4 no. 20 DD). The rules of the DD on economic ownership, which are based on IAS 17 (Kahle and Schulz (2011), p. 300-301), are in line with the concept of a cash flow-oriented taxation.

The concept of a cash flow-oriented taxation stipulates an initial measurement of assets at their acquisition and production costs. Production costs should encompass direct as well as indirect costs of producing the asset. Only administrative overheads are not to be included in the production costs. According to the DD, assets are valued at their acquisition and production costs (Art. 33 par. 1 s. 1 DD) as well. Whether indirect costs

have to be taken into account is, however, subject to controversial discussion.[166] The P-LTU does incorporate a definition of acquisition and production costs (Art. 33 par. 1 s. 2 P-LTU). But it is still unclear which components production costs are made of. The definition, however, can be interpreted in such a way that only direct costs have to be considered (Scheffler and Köstler (2014a), p. 667).

The measurement of assets at their acquisition or production costs is in general consistent comparing the concept of a cash flow-oriented taxation and the DD. Yet, as up to now, it remains unclear what the production costs are composed of according to the DD. Therefore, the definition of production costs as included in the concept of a cash flow-oriented taxation should be used in the DD.

The concept of a cash flow-oriented taxation allows simplified measurement methods for the valuation of inventories. The proposal stipulates no accounting options with regard to the method but prescribes a binding rule to limit the scope of discretion. The DD allows the valuation of inventories, unfinished and finished goods according to the First-In First-Out (FIFO) method or the method of the weighted average (Art. 29 par. 1 s. 2 DD). The P-LTU proposes to also allow the Last-In First-Out (LIFO) method for the measurement of inventories (Art. 21 par. 2 l. a no. ii P-LTU). To adjust the DD to the concept of a cash flow-oriented taxation, this option should be abolished and, based on the common state practice, the method of the weighted average should be introduced bindingly (Spengel and Zöllkau (2012), p. 46 f.).

The concept of a cash flow-oriented taxation prescribes regular amortisation for fixed assets that are depreciable. The rules on depreciation of the DD are the following: long-life tangible assets and intangible assets are subject to individual depreciation on a straight-line basis over 15 years, independently of their actual useful life (Art. 36 par. 1 DD). Long-life tangibles mean fixed tangible assets with a useful life of 15 years and more. Buildings, aircraft, and ships shall be deemed to be long-life fixed tangible assets (Art. 4 no. 16 DD). There is an exception concerning buildings. These have to be depreciated straight-line over 40 years (Art. 36 par. 1 l. a DD). Short-term tangibles, i.e. tangible assets with a useful life of less than 15 years (reverse of Art. 4 no. 16 and Art. 36 DD), are included in an asset pool, that is subject to an infinite geometrical declining

[166] For an interpretation of the DD stating that only direct costs have to be considered for the production cost, see Scheffler and Krebs (2011), p. 18*; Spengel and Zöllkau (2012), p. 45 f. For an interpretation stating that also indirect costs have to be considered for the cost of production, see Kahle and Schulz (2011), p. 299.

balance depreciation at a depreciation rate of 25 % (Art. 39 par. 1 DD). The set amortization periods as well as the pool depreciation rate are only compromise solutions and agreements, which could definitely be discussed and modified. Objectively, there is no correct depreciation rule. The rules of the DD should, therefore, be adjusted to common state practice to enhance the enforceability of the proposal (Spengel and Zöllkau (2012), p. 60 ff.). Consequently, there should be no untypically long straight-line depreciation for buildings over 40 years but a depreciation over 35 years, which is the mean identified when comparing country practices. In contrast to this, pool depreciation for tangible assets is less widely spread and is considered as rather generous. Common straight-line depreciation should replace this pool depreciation, and should be conducted based on the useful life for reasons of simplicity.

The concept of a cash flow-oriented taxation includes no exceptional depreciation due to a mere decrease in value neither for fixed assets nor for current assets. In case of a permanent impairment due to economic or technical wear (e.g. loss, destruction), however, the concept does envisage exceptional depreciation for fixed and current assets. One example is the write-off of a receivable if there is a definite payment default.

The DD includes an option for exceptional depreciation for fixed assets not subject to regular depreciation if its value has permanently decreased (Art. 41 par. 1 DD). For fixed assets that are subject to regular depreciation, exceptional depreciation is not possible (reverse of Art. 41 par. 1 DD). For inventories, there is an obligation for exceptional depreciation regardless of whether the impairment is permanent or not (Art. 29 par. 4, Art. 23 par. 2 DD). For receivables, the DD includes a general value adjustment (Art. 27 par. l. a s. 2 DD).

To adapt the DD to the concept of a cash flow-oriented taxation, it is necessary to abolish the option for exceptional depreciation in case of a permanent impairment for fixed assets that are not subject to regular depreciation. Instead, the obligation for exceptional depreciation in case of a permanent impairment due to economic or technical wear should be introduced. The P-LTU does include an obligation for exceptional depreciation. However, it applies regardless of the duration of the impairment, i.e. also in case of a non-permanent decrease. According to the concept of a cash flow-oriented taxation, exceptional depreciation should be limited to permanent impairments. For fixed assets that are subject to regular depreciation, there is a devaluation prohibition regardless of the duration of the impairment according to the DD. The DD needs to incorporate a

devaluation obligation for these assets in case of a permanent impairment due to economic or technical wear. Concerning inventories, the DD needs to be changed. It should limit the obligation for exceptional depreciation regardless of whether the impairment is permanent or non-permanent and only include the obligation of exceptional depreciation if there is a permanent impairment due to economic or technical wear. Instead of the general value adjustment for receivables, the DD should incorporate an individual value adjustment for bad debt.

According to the concept of a cash flow-oriented taxation, the subsequent measurement of financial assets held for trading is carried out based on acquisition costs, and not fair value. Therefore, there is no exceptional depreciation and write-up in case of a loss or increase in value regardless of the duration. According to the DD, financial assets held for trading are valued at their fair value (Art. 22 par. 1 l. e DD) which comprises that decreases as well as increases in value need to be recorded. Following the proposal of a cash flow-oriented taxation, valuation of financial assets held for trading would need to be adjusted to the extent that these financial assets would need to be valued at their acquisition costs. Valuating financial assets held for trading at their market value, as proposed by the P-LTU (Art. 22 par. 1 l. d P-LTU), does not move the DD closer to the concept of a cash flow-oriented taxation.

Liabilities

According to the concept of a cash flow-oriented taxation, liabilities are to be defined as present obligations of the enterprise arising from past events, the settlement of which is expected to result in an outflow from the enterprise of resources embodying economic benefits (F. 49b). As the DD does not provide a definition for the term liability, it could incorporate this definition.

The proposal of a cash flow-oriented taxation defines provisions based on IAS 37 as a liability of uncertain timing or amount. These are to be recognized when an entity has a present obligation as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation. According to Art. 25 DD, provisions are recognized for legal or probable future legal obligations if the amount arising from that obligation can be reliably estimated. This definition principally equals the proposal of a cash flow-oriented taxation. Additionally, the undefined legal terms included in the DD, as e.g. the legal coming into force of an obligation, should be

substantiated and explicitly defined in the DD based on IAS 37 (amongst others, the more-likely-than-not-criterion).

The concept of a cash flow-oriented taxation as well as the DD include the recognition of provisions for long-term, contingent obligations as well as of distribution and accumulation provisions including pension provisions, but not of provisions for good will or (operating) expenses. The P-LTU, however, introduces an option for member states concerning the recognition of pension provisions, which leads to a deviation from the concept of a cash flow-oriented taxation. This option for member states should not be granted.

Provisions for onerous contracts are also not to be recognized according to the concept of a cash flow-oriented taxation. Whether provisions for contingent losses from pending transactions can be considered according to the DD is questionable.[167] If the excess liability concerning pending transactions stems from a contract concluded in the past, provisions for onerous contracts may be considered and recognized as a subtype of provisions for contingent obligations (Scheffler and Köstler (2013), p. 2194). Introducing a recognition prohibition for provisions for onerous contracts in the P-LTU (Art. 25 par. 3 l. a P-LTU) moves the DD closer to the concept of a cash flow-oriented taxation.

Unlike in the concept of a cash flow-oriented taxation, short-term provisions for contingent obligations have to be recognized according to the DD (Art. 19 l. a, b, Art. 25 par. 1 s. 1 DD). The obligation to recognize short-term provisions for contingent obligations should be eliminated in the DD to achieve greater conformity with the concept of a cash flow-oriented taxation.

The concept of a cash flow-oriented taxation measures provisions at the present value of the expected future payment obligation. A standardized interest rate should be provided and future increases in price and cost should not be taken into account. The DD establishes that provisions need to be recognized at the expenditure required to settle the present obligation at the end of the tax year, based on reliable estimates (Art. 25 par. 2, Art. 26 DD). In measuring provisions, all risks and uncertainties as well as future events (e.g. increases in price and cost) need to be considered. Provisions with a minimum term of twelve months have to be discounted at the yearly average of the Euribor interest rate. As the DD also recognizes provisions at the present value of the expected future payment

[167] For a consideration of provisions for onerous contracts, see Herzig and Kuhr, (2011b), p. 312; Kahle and Schulz (2011), p. 301 f.; Marx (2011), p. 550; Scheffler and Krebs (2011), p. 22*. Doubting, see Petutschnig (2011), p. 329.

obligation, the measurement methods of the DD and the concept of a cash flow-oriented taxation in principal correspond to each other. The interest rate, however, needs to be standardized to avoid potential fluctuations and discretion. Based on the common state practice, it could be set at 5% (Spengel and Zöllkau (2012), p. 54).[168] In addition, future increases in price and cost should not be considered. This has already been implemented in the P-LTU (Art. 25 par. 3 l. a P-LTU).

The concept of a cash flow-oriented taxation principally excludes the recognition of deferred items. Only long-term deferred items and a disagio - if it is uncommon on the market or if the accrual occurs over 5 years - can be recognized. The DD does not comprise explicit rules for deferred items. However, one can derive a recognition obligation for transitory and anticipative deferred items from the rules on accrual accounting of revenue (Art. 18 DD) and deductible expenses (Art. 19 DD). This recognition obligation applies to short-term as well as long-term deferred items. To achieve compliance with the concept of a cash flow-oriented taxation, the DD should incorporate a rule that establishes clearly that only long-term deferred items and the disagio - if it is uncommon on the market or the accrual occurs over 5 years - can be recognized.

The concept of a cash flow-oriented taxation accepts that loss deduction in (common state) practice is not perfect. The DD also does not include a perfect loss compensation, i.e. no (interest-bearing) loss carry-back but only a loss carry-forward that is limited concerning amount and time[169]. This rule could definitely be accepted for reasons of practicability.

4.1.4.2 Evaluation

Some sections of the DD already consider aspects of a cash flow-oriented taxation. The rules of the two concepts are in line concerning the following issues: time of revenue recognition when selling goods (payment before delivery), time of revenue recognition when purchasing goods, principal obligation of recognizing assets and initial measurement of assets at their acquisition or production costs.

[168] This is the mean of the relevant countries' current interest rates.

[169] The P-LTU limits loss carry-forwards to a percentage of the tax base that still needs to be defined (Art. 43 par. 2 P-LTU).

There are deviations with respect to the time of revenue recognition when selling goods (payment after transfer), the extent of the costs of production, the simplified measurement methods, the subsequent valuation of financial assets held for trade, and deferred items.

The DD does not stringently implement the imparity principle. For fixed assets that are not subject to regular depreciation and for current assets, it does incorporate the imparity principle in the form of an exceptional depreciation in case of a decrease in value. However, this does not apply to assets that are subject to regular depreciation. The concept of a cash flow-oriented taxation consistently refrains from applying the imparity principle. Consequently, there is a difference between the DD and the concept of a cash flow-oriented taxation regarding the exceptional depreciation of fixed assets not subject to regular depreciation and current assets. The concept of a cash flow-oriented taxation only allows an exceptional depreciation for a permanent impairment due to economic or technical wear, but no current-value depreciation. There is also a deviation with regard to fixed assets that are subject to regular depreciation. The DD as well as the concept of a cash flow-oriented taxation do not include an exceptional depreciation due to the imparity principle. However, the concept of a cash flow-oriented taxation in this case also allows an exceptional depreciation if there is a permanent impairment due to economic or technical wear. Concerning the regular depreciation of assets, it is the orientation towards the common state practice that leads to deviations between the cash flow-oriented taxation and the DD.

The rules of the concept of a cash flow-oriented taxation relating to the periodization of long-term liabilities equal the DD in great part. There are similarities with respect to the obligation of recognizing long-term, contingent liabilities and regarding distribution and accumulation provisions including pension provisions as well as with regard to the ban on recognizing good will provisions, provisions for onerous contracts and for (operating) expenditures. They basically also correspond with regard to the measurement of provisions and the limited loss deduction. The P-LTU, however, introduces an option for the member states to recognize pension provisions, thereby increasing the difference to the concept of a cash flow-oriented taxation. There are also deviations with regard to the recognition of short-term provisions for contingent liabilities.

The concept of a cash flow-oriented taxation suggests the clarification of undefined legal terms by referring to economic criteria. It uses the IFRS as a starting point. The DD provides such an approach for the definition of economic ownership. Thus, the two

concepts are in line regarding personal attribution. The DD lacks, however, definitions of the terms asset and liability. Thus, the concept requires adaption with respect to these terms. The definition of provisions is principally the same, however, the DD needs further concretization.

In conclusion, we find that in some areas the DD is already in line with the principles of a cash flow-oriented taxation (e.g. periodization of long-term liabilities). Further adaption is necessary, in particular regarding the cash-principle, the abolishment of existing accounting options (e.g. for simplified measurement methods) and discretion as well as the specification of undefined legal terms (based on the IFRS). These changes and thus a greater movement of the DD's principles towards a more strongly cash-oriented profit determination would lead to more clarity and uniformity as well as to less scope for opportunistic reporting behavior. This is due to the fact that our concept would induce a full detachment of the determination of taxable profits from financial accounts and, thus, a transition to a two-book oriented system without any tax sheltering opportunities. Therefore, only legal/deterministic deviations between tax and financial accounts (book-tax differences) may still occur.

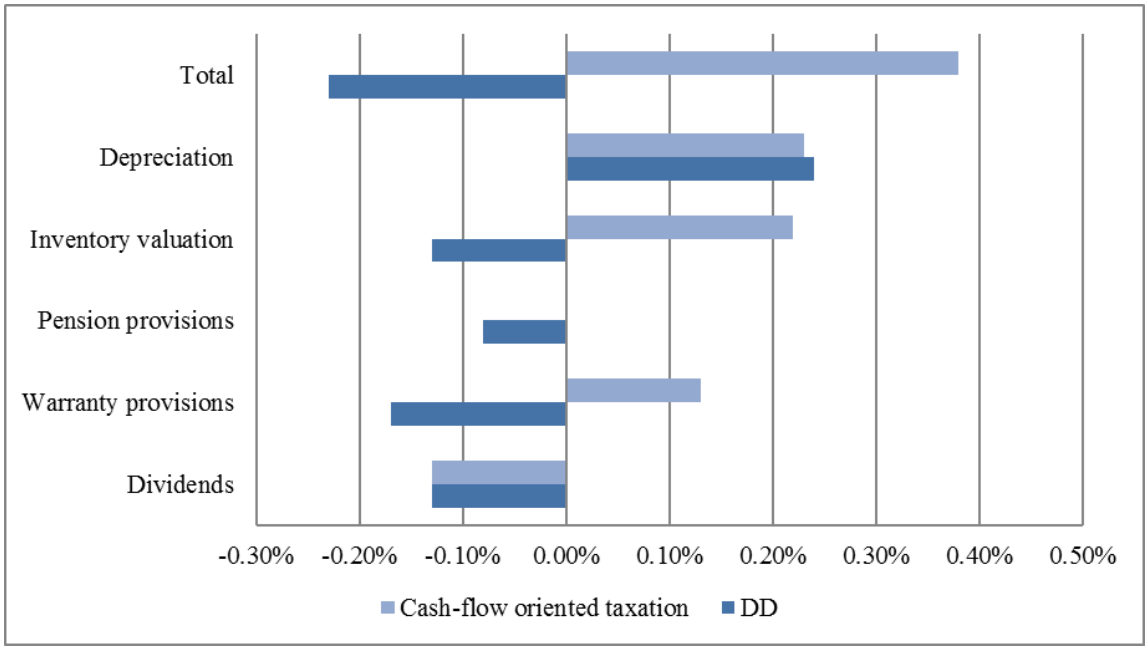
4.1.5 Quantitative impact assessment of a harmonised tax base according to the CCTB as well as the concept of a cash flow-oriented taxation

The political consensus on a harmonised tax base likely depends on the country specific reform consequences on effective tax burdens and tax revenues. To this end, the Centre for European Economic Research (ZEW) and the University of Mannheim have conducted several studies to examine the quantitative consequences of the CCCTB-DD as well as of the concept of a cash flow-oriented taxation (e.g. Spengel et al. (2012); Evers et al. (2014a); Evers et al. (2015)). More precisely, the changes in effective tax burdens induced by the introduction of a CCTB or a cash flow-oriented taxation respectively have been quantified for each of the 28 EU member states for fiscal year 2013 based on the European Tax Analyzer which simulates the tax burden of an average European firm over a ten-year period. The model firm is calibrated based on financial accounts data taken from the AMADEUS database. The approach allows accounting for many important regulations stipulated in the DD and by the method of a cash flow-oriented taxation in great detail. The most important results/findings are summarized in the following:[170]

The quantitative analysis of both reform concepts (see Figure 5) illustrates that profit determination according to the 2011 DD as well as individual regulatory components of the concept of a cash flow-oriented taxation only cause slight changes in tax burdens. Whereas in case of the DD, there is a slight reduction of on average -0.23%, the concept of a cash flow-oriented taxation leads to a slight increase in tax burdens of 0.38%. In case of both concepts, wide dispersion regarding tax burdens in the EU-28 states remains. The changes in the country ranking are also minor.

[170] For more details, see Evers et al. (2014a); Evers et al. (2015).

Figure 5: Change in effective tax burdens related to the introduction of a cash-flow oriented taxation and the DD for the EU-28



The isolated analysis of individual components shows that with regard to the regulations on depreciation, overall, a similar effect (increase in tax burden of 0.24% or 0.23%) can be observed. In both scenarios, the depreciation regulations exert the greatest influence on the total change in tax burden. However, the depreciation procedures according to the concept of a cash flow-oriented taxation are more strongly based on the taxation regulations of the member states than the ones of the DD. Regarding the valuation of inventories, the concept of a cash flow-oriented taxation causes a stronger impact on tax burden due to the full cost approach which is less widespread in the EU. However, both concepts include the transition towards the average method. Compared to the DD, we observe significantly smaller effects with regard to pension obligations for the concept of a cash flow-oriented taxation. This is because the fixed interest rate of 5% complies much more with the taxation practices of the countries than with the very low Euribor interest rate. The prohibition of recognizing warranty provisions is linked to a slighter deviation of tax burden in absolute terms. Principally, countries whose national tax law allows the recognition of provisions experience an increase in tax burden. The two approaches are conceptionally equal regarding dividend exemption. Thus, the quantitative analysis shows no differences. On average, both concepts cause a slight reduction in tax burden in comparison to national law.

Overall, we can assume lower tax-related compliance costs as well as better political enforceability of the concept of a cash flow-oriented taxation compared to the DD for the

following reasons: the on average positive deviation of effective tax burdens, its conceptional strengths and its stronger orientation towards the taxation practices of the EU member states.

4.1.6 Summary

(1) With regard to the CCCTB-DD, proposed by the European Commission in March 2011, a two-step procedure as a starting point for harmonizing taxable profits in Europe is preferable. This approach has also been adopted by the recently published revised proposal for a CC(C)TB (October 2016). This stepwise strategy suggests merely aligning the provisions for the determination of the corporate tax base (CCTB) in a first step. Consolidation and apportionment are only to be implemented in a second step at a later point in time.

(2) The proposed CCTB rules are in principle appropriate for harmonizing the tax base in Europe. The DD lacks, however, detailed definitions of legal terms as well as a clear legal concept for special issues in tax accounting such that there are still numerous regulatory gaps as well as room for interpretation. These cannot be eliminated by referring to national (civil) laws.

(3) A possible solution would be to base the harmonization of tax bases in Europe (CCTB) on a cash flow-oriented taxation/modified net income method. This concept would gear profit determination more strongly towards the cash-principle and limit accrual accounting and periodical adjustments.

(4) In some areas, the DD is already in line with the principles of a cash flow-oriented taxation (e.g. periodization of long-term liabilities). Further adaption is necessary in particular regarding the cash-principle, the abolishment of existing accounting options and discretion as well as the specification of undefined legal terms. These changes and thus a greater movement of the DD's principles towards a more strongly cash-oriented profit determination would lead to more clarity and uniformity and, at the same time, induce a transition to a two-book oriented system with less scope for tax sheltering.

(5) Changes in tax burdens are likely to be minor. A quantitative analysis of the effective tax burdens of corporations in each of the 28 EU member states illustrates that profit determination according to the DD as well as individual regulatory components of the concept of a cash flow-oriented taxation only cause slight changes in tax burdens compared to national law.

(6) Whereas in case of the DD, there is a slight reduction of on average -0.23%, the concept of a cash flow-oriented taxation leads to a slight increase in tax burdens of 0.38%. Regulations on depreciation, the valuation of inventories as well as the recognition and measurement of provisions are important factors influencing these tax effects.

(7) From a conceptional point of view, the cash flow-oriented taxation is superior to the DD. Furthermore, its stronger orientation towards the taxation practices of the EU member states would imply lower tax-related compliance costs as well as an increased political enforceability.

4.2 Transparency in Financial Reporting: Is Country-by-Country Reporting suitable to combat international profit shifting?

4.2.1 Introduction

Tax planning efforts of highly profitable US multinationals such as Google, Apple or Amazon and their extremely low effective tax rates on their non-US profits have become the subject of intense public debate over the last years.[171] The fact that these companies pay almost no corporate taxes in the foreign jurisdictions they operate in can most likely be attributed to activities aimed at shifting profits to tax havens. To this end, companies effectively exploit gaps and loopholes in international tax laws, such that their endeavors do not in general classify as illegal. Yet, the acceptability of such activities from a social and ethical point of view is widely discussed; some call it 'aggressive' even though a clear distinction between 'acceptable' and 'aggressive' tax planning is hard to define.

Although there have been several attempts to quantify the scale of profit shifting,[172] no accurate estimate of the exact amount of profits transferred to low tax jurisdictions exists to date. There is, however, reason to believe that the problem has been considerably overestimated.[173] Nevertheless, empirical evidence clearly shows that profit shifting within multinationals does indeed take place regardless of the specific industry sector. In that respect, several channels have been identified: On the one hand, international tax rate differentials are found to be the major driver of profit shifting (Grubert and Mutti (1991); Hines and Rice (1994); Huizinga and Laeven (2008); Egger et al. (2010); Dharmapala and Riedel (2013); Fuest et al. (2011); Heckemeyer and Overesch (2013)). On the other hand, debt financing as well as transfer pricing in general and licensing of Intellectual Property (IP) in particular are identified as the most important channels to relocate profits (Desai et al. (2004); Buettner at al. (2012); Clausing (2003); Desai et al. (2006); Dischinger and Riedel (2011); Karkinsky and Riedel (2012); Lohse and Riedel (2013); Dharmapala (2014)). Here, transfer pricing rather than debt financing turns out to be the dominant channel for profit shifting (Heckemeyer and Overesch (2013), p. 30).

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[171] For a detailed discussion see Fuest et al. (2013).

[172] Murphy assumes that tax evasion and tax avoidance costs the EU member states 1 Trillion € a year, see Murphy (2012), p. 2; according to Bach, in Germany the yearly revenue loss due to profit shifting amounts to ca. 90 Billion €, see Bach (2013), p. 3 ff.; Heckemeyer and Spengel, however, assume the revenue loss in Germany to be less than 10 Billion € and therefore much lower, see Heckemeyer and Spengel (2008), p. 54; Oxfam calculates a revenue loss of $ 50 Billion for developing countries, see Oxfam (2000).

[173] The OECD estimates a global revenue loss of only USD 100-240 Billion at 2014 levels, see OECD (2015d).

As a countermeasure to this issue, the Organization for Economic Co-Operation and Development (OECD) released a global action plan against Base Erosion and Profit Shifting (BEPS) in July 2013 (OECD (2013a)). This action plan was adopted by the G-20 leaders[174] and is – in principle – supported by the European Commission (European Commission (2013), p. 4). Arguing that a lack of transparency in financial reporting facilitates profit shifting (Murphy (2009), p. 4), the OECD action plan also includes – among other things – specific actions (Action 11-13) aimed at enhancing the disclosure quality of tax-related information. More precisely, the OECD and the European Commission have recently released several proposals for a so-called Country-by-Country Reporting (CbCR). This concept is based on the disclosure of key business information such as profits and taxes paid for each country that a multinational operates in. The proponents of CbCR claim that the disclosure of such information might serve the purpose of detecting abusive tax arrangements. Furthermore, it is argued that this kind of disclosure could build up pressure on companies to pay a fair amount of tax in relation to their economic activity in each country. In this paper, we examine whether CbCR actually is an appropriate means to achieve these objectives or whether there are other measures to more effectively combat international profit shifting.

Our paper is organized as follows: First, we provide an overview of existing provisions and recent developments regarding CbCR (chapter 4.2.2). Second, we discuss the current proposals of the OECD and the European Commission for a comprehensive CbCR and examine what data source for providing tax disclosure may be most appropriate (chapter 4.2.3). In addition, we analyze expected costs and benefits linked to country-specific reporting (chapter 4.2.4). Third, we derive potential alternatives for reform (chapter 4.2.5). Finally, we conclude (chapter 4.2.6).

4.2.2 Existing provisions and recent developments for Country-by-Country Reporting

Until recently, there has not been any binding legislation prescribing a comprehensive CbCR for all countries and industry sectors. However, certain regulations requiring country-specific information have already been put in place, albeit only for specific sectors, namely the extractive (production of oil, natural gas and minerals) and financial sectors respectively. These specific CbCR-requirements are mainly outside the scope of financial reporting. The most comprehensive rulings concern the extractive industry, not

[174] See http://en.g20russia.ru/news/20131129/784497471.html.

because of tax reasons, but rather due to a high risk of corruption in this sector. The Extractive Industries Transparency Initiative (EITI),[175] for instance, an international standard which countries may sign up to voluntarily, is basically aimed at reconciling company and government payments. Participating countries have the duty to produce a public report, but are, however, entitled to decide on the exact form and scope of disclosure. In contrast, according to the Dodd-Frank Act, listed companies in the US operating in the extractive sector are obliged to publish payments made to governments on a country-by-country basis and in a standardized way.[176] Similarly, the European Union (EU) Accounting and Transparency Directive implemented in July 2013 requires EU (listed and large non-listed) companies in the extractive and forestry sectors to disclose payments to national governments as part of their annual financial statements.[177] Yet, like the other two initiatives, it does not intend the declaration of country-specific profit figures and tax payments. By contrast, the EU Capital Requirements Directive IV ("CRD IV")[178], adopted in July 2013, is the first initiative governing country-by-country disclosure for financial institutions in the EU. Primarily aimed at the enhancement of transparency, this directive stipulates that all concerned companies publicly disclose the names of their operations, turnover and the number of employees in every relevant country, effective from 2014. Most important, however, are country-specific data on profits/losses and tax payments, which still have to be confidentially reported to the Commission only.

Recently, there has been a development towards enhanced transparency through stricter and more extensive disclosure requirements for companies in all industry sectors, which was mainly triggered by the publication of the OECD action plan on BEPS (OECD (2013a)). In particular, actions 11 to 13 of the plan address the collection of firm-level data on BEPS and the disclosure of aggressive tax planning arrangements that companies may make use of. Moreover, the action plan calls for the disclosure of country-specific tax-related information as a part of the transfer pricing documentation (OECD (2013b)). Taxpayers would be obliged to report income, taxes paid and certain indicators of economic activity to governmental authorities, i.e. CbCR information would not be made publicly available. While the Discussion Draft on Transfer Pricing Documentation and

[175] http://eiti.org.
[176] See Congress of the United States of America (2010). Similar regulations apply for companies listed at the Hong Kong Stock Exchange (HKEX).
[177] Directive 2013/34/EC.
[178] Directive 2013/36/EU.

CbCR (OECD (2014a)) specified this concern by stipulating that CbCR should become a compulsory part of a master file of the transfer pricing documentation, the subsequent Guidance on Transfer Pricing Documentation and CbCR (OECD (2014b)) implemented a three-tiered structure where CbCR constitutes a separate part (besides a master and a local file). Later on, the OECD released the Guidance on the Implementation of Transfer Pricing Documentation and CbCR (OECD (2015a)) containing more details with regard to the scope of application (e.g. affected companies and time period) as well as the CbCR Implementation Package (OECD (2015b)) providing precise suggestions for implementation into national legislation. Eventually, the Final Report on Transfer Pricing and CbCR (OECD (2015c)) summarized the OECD's proposals.[179] These proposals should be implemented into national laws applying to fiscal years from 2016 onwards. Several countries have already realized such CbCR regulations in their national laws[180] or have put forward specific draft proposals.[181] As an additional step towards the implementation of a successful comprehensive CbCR, 82 countries have lately signed a multilateral competent authority agreement (MCAA)[182] which serves as a base for the exchange of CbCR information among tax authorities.[183]

Likewise, the European Commission has put forward several proposals to promote a comprehensive CbCR. First, CbCR was launched as a major element of the Anti-Tax Avoidance Package (European Commission (2016a)) in January 2016. This initiative primarily resulted from the OECD's final CbCR proposal and is to a great extent in line with the suggested regulations. Furthermore, there has been introduced a draft that obliges national tax authorities to automatically exchange confidential CbCR information (European Commission (2016b)).[184] This directive, stipulating a comprehensive CbCR for large EU multinationals, was adopted in May 2016 and should be implemented into national laws until 4 June 2017 (European Commission (2016c)). In addition to that, the EU released a CbCR Directive (European Commission (2016d)) as amendment to the existing Accounting Directive in April 2016 which envisages all large multinational companies operating in the EU to publicly disclose a limited CbCR entailing several tax-related information. Hence, Multinational Enterprises (MNE) operating in the EU would

[179] For details on the specific content, please see chapter 4.2.3.1.
[180] These countries include e.g. Spain, Poland, Denmark, France, the Netherlands, Italy, UK, Australia and Mexico.
[181] E.g. Ireland, Norway, Belgium, USA, Germany.
[182] See https://www.oecd.org/tax/automatic-exchange/international-framework-for-the-crs/.
[183] Status: 12 May 2016. The US, for example, has instead opted for bilateral agreements.
[184] The Draft Directive on the exchange of tax-related information was an amendment to the Administrative Cooperation Directive.

be under duty to file two separate reports: One full CbCR only available to tax authorities as well as one partial CbCR available to the public.

4.2.3 Comprehensive Country-by-Country Reporting

4.2.3.1 Details of the current proposals

The current OECD proposal provides quite extensive guidelines for a comprehensive CbCR concerning all industry sectors.[185] They are intended to apply in the participating countries for fiscal years starting on 1 January 2016, but the report could be handed in one year later (by the end of 2017). The rulings shall be effective on a mandatory base[186] for all large multinational corporations having annual consolidated group revenue of more than 750 mn Euro in the preceding fiscal year. It is expected that 90% of all multinational groups would therefore be exempted from the CbCR obligations, however, at the same time, CbCR would still be filed by groups controlling 90% of corporate revenue (OECD (2015a), p. 4).

The OECD generally suggests CbCR to be part of the transfer pricing documentation. More precisely, they envisage a three-tiered approach consisting of a master file intended to provide transfer pricing information regarding all involved jurisdictions, a local file with country-specific transfer pricing information which is only made available to the respective jurisdiction as well as the actual CbCR. The OECD claims that such a CbCR would serve tax authorities in assessing the transfer pricing risk as well as in detecting profit shifting activities. As far as the structure of the report is concerned, the OECD's model template entails three different tables. Table 1 constitutes the main part of the CbCR and contains information on all requested items. Specifically, MNEs would have to disclose the following figures on an aggregated basis (not per entity) for each tax jurisdiction they are operating in:

- Revenue (divided by unrelated and related party)
- Profit (loss) before income taxes
- Income tax paid (on cash basis)
- Income tax accrued - current year
- Stated capital
- Accumulated earnings
- Number of employees

[185] The current EU proposal is based on these guidelines as well.

[186] Hardeck (2015) argue that the mandatory design of the proposal may be due to the fact that previous initiatives which were based on voluntary disclosures turned out not to be successful (see p. 397).

- Tangible assets other than cash and cash equivalents

In general, data on profits and related tax payments in the relevant countries are intended to evaluate the appropriateness of the amounts of taxes paid. In addition, several further disclosures serve the purpose of examining a company's real economic activity in a country. Most importantly, the template includes income tax paid and income tax accrued in the respective jurisdictions. The first comprises profit taxes as well as withholding taxes of the group, whereas the latter includes taxes payable, but no deferred taxes or provisions for contingent tax liabilities. Overall, this tax reporting might include items not necessarily relating to the current period (such as tax prepayments, tax refunds or tax arrears).

Table 2 of the template is aimed at providing additional information on the group structure and on the business activities conducted in the involved jurisdictions, and thus on the value chain of the MNE. Table 3 offers the reporting MNE the opportunity to provide additional explanations.

In general, it is the ultimate parent entity's duty to file the transfer pricing and CbCR documents and to hand it in to its home jurisdiction's tax authority. Under certain circumstances, e.g. if the parent company's home country does not prescribe a CbCR or if there is no information exchange between the tax authorities, the obligation to file a CbCR can also be transferred to a domestic subsidiary.[187] In case of non-compliance, the levy and collection of penalties is subject to national tax legislation.

Importantly, all of the CbCR information should only be reported confidentially to the tax authorities. This information would then be exchanged and made available to all relevant countries. While the EU directive and proposals on CbCR are conceptually very similar to the presented OECD approach, the most recent one differs significantly with regard to the kind of publication: Unlike the OECD, the EU suggests to additionally make certain parts of the CbC report publicly available.[188] The information would be published in a stand-alone report accessible to the public for at least 5 years on the company's website.

Although the proposed guidelines can be considered as quite detailed, there is no explicit and distinct principle as regards the data source on which CbCR should be based. The

[187] For further information, see Lappé and Schmidtke (2015), p. 694.

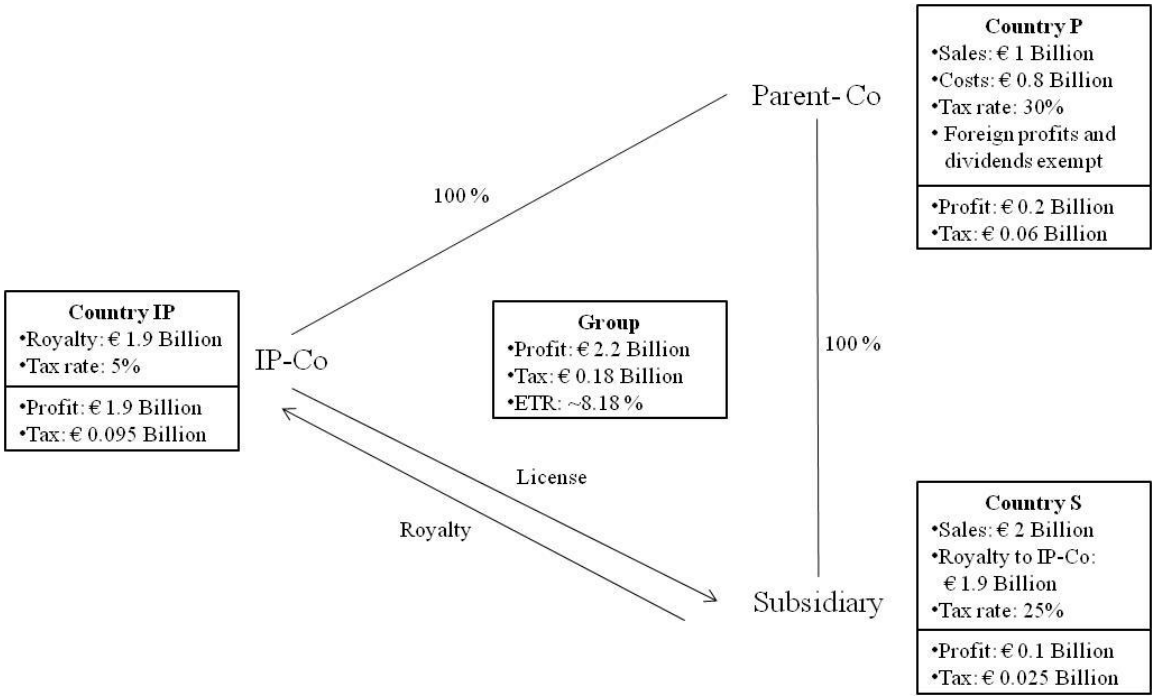
[188] Not all information items are included in the public CbCR e.g. revenues are reported in total only and information on tangible assets or share capital are not contained.

only requirement stated is that the same data basis has to be used from year to year in order to preserve consistency. Nevertheless, there are various different sources that MNEs might refer to: For instance, consolidation reporting packages, separate entity financial statements or internal management accounts. In the following, we discuss which data source for providing tax disclosure may be most appropriate.

4.2.3.2 Sources for providing (CbCR) information

The evaluation (in particular for consolidated and individual financial statements) is based on a simple example for intra-group profit shifting of multinationals incorporating an IP-Holding company located in a low-tax jurisdiction (see Figure 6).

Figure 6: Example for international profit shifting



The example assumes a parent company (Parent-Co) in Country P with a 100% holding in a subsidiary in high-tax jurisdiction S and an IP-Holding in low-tax jurisdiction IP, where the group's IP (e.g. a patent) is located. The IP is licensed to Subsidiary in Country S in exchange for a royalty payment reducing the subsidiary's profit. Foreign profits and dividends are exempt from tax in Country P. Figure 6 displays separately the amount of sales, costs and pre-tax profits as well as intra-group transactions and the nominal tax rates for each company and country – P, S and IP. If total profits of the group (€ 2.2 Billion) were taxed at the level of Parent-Co, the tax charge would amount to € 0.66 Billion (= 2.2*0.3). In our example, however, the tax charge is reduced by € 0.48 Billion to € 0.18 Billion. Above all, from the total sales of € 2 Billion from the

Subsidiary in Country S, € 1.9 Billion are shifted to IP-Holding, yielding a tax saving of € 0.475 Billion (= (0.3-0.05)*1.9). Considering additionally the tax reduction in Country S, the total tax saving amounts to € 0.48 Billion (= 0.1*(0.3-0.25) + 0.475).

According to prevailing accounting standards (e.g. International Financial Reporting Standards (IFRS)), consolidated financial statements disclose tax information in the profit and loss statement, the tax reconciliation and the segmental reporting. Building on consolidated accounts as a starting point for CbCR, however, has several drawbacks and does not seem to be feasible: Most importantly, consolidated financial statements are supposed to provide decision-useful information about a group of companies as a single economic entity. Therefore, intra-group transactions are consolidated and do not affect the overall profit. Profit shifting activities by means of intra-group transactions are, thus, not visible in consolidated financial statements. This is due to the netting out of profits and expenses within the group (in our example: royalty income of IP-Holding and payments of Subsidiary of € 1.9 billion) and the aggregation of total tax payments (see Figure 7) (van der Ham and Tomson (2015), p. 844).

Figure 7: Intra-group profit shifting and consolidated financial accounts

The profit & loss statement therefore only reveals sales (€ 3 billion), costs (€ 0.8 billion) and profits (€ 2.2 billion) in aggregated form. The intra-group licensing arrangement is disregarded. Tax reconciliations, on the other hand, only disclose the total tax reduction (i.e. a low effective tax rate (ETR)) due to operations in low tax jurisdictions (€ 0.48 billion), but do not specify the underlying profit shifting mechanisms or countries involved, as required by a CbCR (in our example the interposition of the IP-Holding). Segmental reporting as another part of consolidated accounts does not deliver country-specific information either. According to the management approach (e.g. IFRS 8), data is disclosed on a business-unit level, yet not necessarily on a geographic or even per-country basis. In the context of our example, it could be possible that Parent-Co, Subsidiary and

IP-Holding all belong to the same business unit and therefore no more detailed information would be provided. Hence, in order to reveal single intra-group transactions, it would be necessary to examine "de-consolidated" data. This, however, does not serve the purposes of reporting on group level. In addition, financial statements contain data based on future prospects of the company, while CbCR is intended to detect profit shifting behavior in past periods. Therefore, it can be concluded that consolidated financial statements do not seem to be the appropriate source for CbCR information.

Alternatively, one could think of individual financial statements as a starting point for CbCR information. Although individual financial statements, as opposed to consolidated financial statements, contain unconsolidated data on single company level, such an approach would have several drawbacks as well (e.g. OECD (2013b)). First, the exact source and direction of intra-group transactions do not become evident on a per-country basis. Second, individual financial statements are, in general, prepared according to local Generally Accepted Accounting Principles (GAAP) and might be quite heterogeneous and thus not comparable across countries. Third and most importantly, financial accounts neither reflect taxable income nor do they provide reliable estimates for the true value of assets. As a general rule, book-tax-differences arise in most countries due to country-specific tax laws; the exemption from tax of certain types of income - in particular inter-company dividends and foreign source income - and non-deductible expenses are the most prominent examples. In addition, other reasons relating to different interrelations between financial accounting and national tax laws (e.g. different tax accounting standards and provisions to allocate income and expenses) are decisive for financial profits not necessarily to reflect taxable income (Endres et al. (2007); Schön (2005a); Spengel and Zöllkau (2012)). Regarding the reflection of the value of assets, in particular intangibles, it may be that they are not recorded at all, if self-developed, or only at historical costs. According to our example in Figure 7, it might be indeed misleading if IP-Holding had created the IP on its own and would display no or a very low value for intangibles in its financial accounts on the one hand and would report high taxable profits from royalties on the other hand.

Other existing sources of information would come along with comparable drawbacks. Internal management data, for example, is expected to be even more heterogeneous among corporations as well as among countries due to a lack of standardization and binding reporting guidelines. The reporting practices would, therefore, be highly dependent on the internal processes of the MNEs and, thus, not be comparable at all.

To conclude, neither consolidated or individual financial statements nor other existing data sources can serve as a suitable basis for a comprehensive CbCR. Therefore, it would be necessary to define a standardized and harmonized set-up with respect to regulations and definitions (determination of income and valuation of assets). Such separate mandatory rules could, for example, be based on a harmonization of the determination of taxable income. In that regard, the European Commission has put forward a concept for a Common Consolidated Corporate Tax Base (CCCTB) (European Commission (2011), European Commission (2016e, 2016f)). The proposed Council Directive provides a carefully prepared framework for a harmonized determination of corporate taxable income. The CCTB rules are, in principle, in line with tax accounting practice in the EU and are appropriate for harmonizing the tax base (Spengel and Zöllkau (2012)). This could, therefore, be a promising avenue and data source for a comprehensive CbCR within the EU. Finally, it has to be decided if and by whom the CbC report should be audited.

4.2.4 Expected costs and benefits

As a prerequisite for a CbCR to be meaningful at all, the expected benefits of any additional disclosure of tax information have to outweigh the expected costs. Yet, to date, little is known about the exact costs and benefits related to CbCR.

4.2.4.1 Costs

CbCR is suspected to be associated with several direct costs for disclosure.[189] In addition, implicit costs occur; the volume of such implicit costs is likely to exceed that of direct costs for disclosure and depends on whether the disclosure is made public (as envisaged by the EU) or only available to tax authorities (as suggested by the OECD).

First of all, direct costs for disclosure would initially arise for adjusting existing systems and processes to the requirements of CbCR. While it is clear that these costs probably depend on various factors, such as the complexity of the group structure, there is no unanimity among experts as to whether the data collection for CbCR purposes generally is particularly burdensome or not. Some (Murphy (2009), p. 21) argue that many existing financial reporting systems are already technically able to deliver country-related data or that the necessary information even exists and can be derived from financial and internal accounts as well as from tax declarations (Kroppen (2013); Rödder and Pinkernell (2013);

[189] The following discussion of possible costs of a CbCR is adapted from Devereux (2011), p. 34-38.

Heber (2013)). By contrast, others invoke substantial data-related costs contending that the established transfer pricing systems would need to be substantially expanded, as CbCR requires data that is not necessary for current transfer pricing analysis and is therefore not yet existing (e.g. Pinkernell (2014), p. 966). Moreover, since the proposals are not specific as regards the data base to be used, affected MNEs first of all need to spend resources on figuring out which data source works best for them. Direct costs for reporting would also be incurred for each CbC report on a regular basis. Not only would it be costly to collect all required information, but also to maintain data consistency across countries and across time. For instance, it is likely that multiple data sources are needed to gather all CbCR information and coordinating these different sources may be cumbersome (Lappé and Schmidtke (2015)). Moreover, conceptual and practical differences with regard to specific CbCR items may impose a challenge to consistency. As regards firms' declaration of profit taxes, it is, for example, common in the BRIC states to combine profit and sales taxes (Loitz (2015), M5). Data validity will, however, be limited if such inconsistencies emerge. Furthermore, direct costs relate to the potential necessity to audit the CbC report. Finally, CbCR could become expensive to the extent that companies consider it necessary to justify and extensively explain their reports to the public (Devereux (2011), p. 32 ff.).

Next, implicit costs of CbCR would primarily stem from disclosing information to the public as envisaged by the EU proposal. Here, CbCR could be associated with considerable competitive disadvantages. Publishing commercially sensitive information is particularly problematic as country-specific reporting is not mandatory for all companies, but is restricted to large MNEs in specific countries. Hence, "small" MNEs outside the scope of CbCR may be able to use published data for non-tax reasons, e.g. for deriving business secrets (Hardeck (2015), p. 406). In addition, implementing public CbCR in the EU only would give rise to severe competitive disadvantages for MNEs operating within the EU compared to corporations conducting business exclusively outside the EU (Bärsch et al. (2016), p. 976). Thus, CbCR would constitute a considerable locational disadvantage for the EU. If it all, public CbCR should therefore only be implemented globally without any regional restrictions.

More generally, disclosing data on tax payments potentially violates tax secrecy, which constitutes a guiding principle of tax law in most countries in the world. Even if CbC reports weren't disclosed to the public, but only to tax authorities, tax secrecy could be put at risk. As there are substantial international differences with regard to the scope of

tax secrecy,[190] it may turn out that the confidential treatment of CbCR data by foreign tax authorities cannot be ensured. To prevent harm to MNEs' competitiveness and to assure the confidentiality of CbCR data, countries would need to be required to enforce their legal standards with regard to tax secrecy (Cockfield and MacArthur (2015)).

In addition, international tax law is highly complex and public interested parties without profound knowledge of the subject or of the MNE's allocation of functions and risks might be unable to appropriately process and interpret the information disclosed. For instance, low (or zero) tax payments do not necessarily point to tax aggressiveness or at least do not necessarily result from illegal undertakings. Nevertheless, wrong accusations against companies could result (Reibel (2015), p. 210).

Another potential implicit cost of CbCR is associated with the danger of double taxation even in the absence of public disclosure: Knowing all tax payments on a country-by-country basis could make tax authorities, especially those of the increasingly powerful BRIC states, raise their own claims towards companies (Schlie and Malke (2013), p. 2469) and thus give rise to tax-related distributional conflicts (Pinkernell (2014), p. 971). Specifically, CbCR data could induce countries to arbitrarily make transfer pricing adjustments without any reference to the arm's length principle. Hence, CbCR could ultimately constitute an instrument to extend source taxation, especially by emerging and developing countries, and thus impose a threat in particular to firms with a strong export focus. In addition, the danger of double taxation not only pertains to the affected companies, but it may also come as a cost to tax authorities: For instance, according to Ditz and Quilitzsch (2014), the removal of double taxation vis-à-vis the BRIC countries often happens at the expense of German tax authorities. However, it also needs to be emphasized that the OECD explicitly states that it is the purpose of CbCR to enable the mere assessment of transfer pricing risk, rather than allowing for transfer pricing adjustments being made on the basis of CbCR data (OECD (2015a), p. 5). Yet, the overview on the global allocation of income, economic activity and tax payments may ultimately lead to calls for a global formulary apportionment system, which is expected to come at the expense of the tax bases of export oriented countries (Reibel (2015)), such as Germany.

[190] Only some countries, e.g. Finland, Sweden and Norway, require individual and/or corporate tax returns to be publicly disclosed. In Japan, public disclosure of individual and corporate tax return data was mandatory from 1950-2004 (see Hasegawa et al. (2013), p. 572).

4.2.4.2 Benefits

A major argument brought forward by proponents of CbCR is that companies would be urged to pay taxes at an amount that truly reflects the companies' economic activity and its utilization of public infrastructure in a particular country (Deutscher Bundestag (2013), p.1; Devereux (2011), p. 7). Indeed, CbCR could be a useful instrument to shed some light on MNEs' value chains and their actual economic circumstances (Fehling (2015)). Furthermore, the overview on the allocation of profits and tax payments may be beneficial for tax risk analysis and trigger audits where appropriate (Cockfield and MacArthur (2015)).

Yet, this reasoning is merely speculative, in particular since the common tax minimization strategies employed by multinationals are mostly based on the exploitation of loopholes in domestic and international tax laws and are therefore in itself not illegal. Moreover, the argument relating to the aim of assessing the appropriateness of profit allocation cannot be based on theoretical foundations, since it is virtually impossible to properly allocate profits and costs to single affiliates of a group by means of transfer prices: By setting up an integrated group of companies, coordination of transactions via markets is abandoned in favor of coordination using intra-organizational hierarchies. The aim is to generate economies of integration, for example by means of lower transaction costs, improvement of information flows or managerial efficiency. As a result, the profits of an integrated group of companies are higher than the aggregate profits earned by its separate entities. Since the excess profits accrue at group level, it is theoretically impossible to determine the source of these profits as they cannot be attributed to specific and, above all, individual transactions either (McLure (1984), p. 94 ff.; Avi-Yonah and Benshalom (2011), p. 379; Jacobs et al. (2016), p. 636 f.; Schön (2010), p. 233 ff.; Ault (2013), p. 1200-1201; Oestreicher (2016)). Moreover, MNEs' profits nowadays are substantially driven by intangible assets that are hardly locatable and very difficult to value (Oestreicher (2014)).

Even if one accepts transfer pricing as an appropriate means for profit allocation, various experts doubt the OECD's claim that CbCR information is useful to examine transfer pricing or even BEPS-related risks and to assess whether an appropriate amount of taxes has been paid (Kroppen and Rasch (2014)). More generally, one could even contend that it is not reasonably possible to relate taxes paid and annual profits of a single fiscal year, given that the reported items may be impacted by transactions relating to other periods

(e.g. loss carryforwards); i.e. high profits and low tax payments do not necessarily need to be at odds.

In addition, it is also questionable to what extent CbCR actually entails additional insights and benefits for tax authorities. Tax authorities can be assumed to be already familiar with the common (legal) tax planning channels and arrangements used for profit shifting, ever since the most prominent examples have been made available to the public (Pinkernell (2012), p. 369 ff.; Kleinbard (2011), p. 707 ff.). Furthermore, it is not even clear whether tax authorities have sufficient resources to process and utilize CbCR data. It seems to be – above all – of high interest of large Non-Governmental Organizations (NGO).

CbCR, therefore, might only provide hints as regards the question of which companies should be audited or examined with increased scrutiny. This might be relevant for inbound investments in particular. Then, however, it could be argued that it is not necessary to stick to the EU's proposal and make CbCR publicly accessible, i.e. it would be sufficient to make the information available to fiscal authorities only.

If, however, CbCR information were made available to the public, proponents of CbCR also claim that an enlarged information set would be beneficial from a capital market point of view. For instance, knowing which countries a multinational operates in could potentially enable investors to better assess the companies' geo-political risk and the sustainability of its tax charge (Murphy (2009), p. 14).[191] Yet, some empirical evidence suggests that capital market participants already face an information overload and do not actually consider the full information set available (Lenter et al. (2003), p. 823 ff.; Raedy et al. (2011), p. 3).

There is, however, some empirical evidence indicating a negative relationship between enhanced disclosures (transparency) and tax aggressiveness. For instance, Dyreng et al. (2016) find that firms which are subject to public scrutiny engage less in tax avoidance, indicating that public pressure can exert some influence on MNEs. In a similar vein, Herbert et al. (2015) contend that reduced public disclosure is positively correlated with international tax avoidance. Hence, this finding may speak in favor of increased disclosures as required by CbCR. There even is some evidence for negative reputational effects of tax sheltering: Hanlon and Slemrod (2009) find, on average, negative stock price reactions when there is news about a firm's involvement in tax shelters.

[191] Investors could for instance see whether the tax charge largely depends on operations located in tax haven countries.

Yet, the question remains as to whether CbCR is actually suitable to uncover such tax shelters and to substantially reduce tax minimization grounded on the utilization of beneficial regimes and constructional flaws in international tax law. Overall, public pressure resulting from CbCR would be rather expected in case of illegal endeavors, which, however, are mostly not the reason for the strikingly low effective tax rates of multinationals currently observed. Thus, it also remains uncertain whether CbCR would actually exert any persistent influence on customers' purchase decisions.

4.2.4.3 Interim conclusion

To sum up, it can be concluded that the expected benefits of CbCR (at least partially) lack a theoretical foundation and, overall, do not seem to outweigh the associated costs. Given the particularly high costs associated with public disclosure, CbCR should only be made available to tax authorities – as it is proposed by the OECD –, if at all. To keep implementation costs as low as possible, there is a need to clearly specify which distinct data source has to be used by reporting MNEs. It also has to be made sure that tax secrecy is reinforced in all participating countries and that CbCR is not exploited by tax authorities as a means to extend source taxation.

Overall, it appears to be more reasonable to combat tax aggressiveness by different means. It is, therefore, up to legislators to remove unintended gaps and loopholes in the tax laws.

4.2.5 Alternatives

As discussed above, it seems unlikely that legal tax planning activities can be combated by means of a CbCR. Rather, it might be more effective to limit the leeway companies have with respect to constructing tax minimizing group structures. Empirical evidence reveals intra-group financing and transfer pricing as the most prominent channels for multinationals' profit shifting. In a recent meta-analysis, Heckemeyer and Overesch (2013) show that transfer pricing is by far the most dominant profit shifting channel. While transfer pricing explains 72% of the total share of shifted profits, the share of intra-group financing amounts to 28% only (Heckemeyer and Overesch (2013), p. 23-26). Further empirical evidence shows that enforcing tax rules does indeed reduce tax aggressive behavior of multinational companies.

One example for the tightening of tax rules has been the enforcement of transfer pricing rules in the last years. Lohse et al. (2012) aim to generate a measure for the stringency and impact of transfer pricing rules showing that the regulations have become stricter

over time. Lohse and Riedel (2013) use these insights to demonstrate that such transfer pricing regulations significantly reduce profit shifting activities by up to 50% (measured by the sensitivity of corporate pre-tax profits to changes in the corporate income tax rate). In particular, penalties exert an additional limiting effect on profit shifting behavior. Furthermore, they argue that higher administrative costs arising from additional documentation requirements can be justified in the light of anticipated benefits. In line with that, Beer and Loeprick (2015) find that, on average, estimated profit shifting among MNE subsidiaries is reduced by 52% two years after the introduction of mandatory documentation requirements. In addition, Luckhaupt et al. (2012) point out the importance of a standardized set of transfer pricing rules in order to decrease complexity and to actually reduce the leeway for profit shifting.[192]

With regard to intra-group financing, various studies have also revealed the effectiveness of thin capitalization rules. Buettner et al. (2012) find that thin-capitalization rules effectively reduce multinationals' incentive to make use of internal loans for international tax planning. Blouin et al. (2014) obtain similar results concerning the effectiveness of thin capitalization rules with respect to their impact on the capital structure of multinational firms (reduction of internal debt).

A promising avenue might therefore be to close gaps and loopholes and to reduce leeway in domestic and international tax laws. However, in that case, it would be important to ensure that tightened regulations do not lead to double taxation, i.e. these regulations would have to be universally accepted by all countries.

4.2.6 Summary

(1) Aggressive tax planning efforts of highly profitable multinational companies (so called BEPS) have become the subject of intense public debate in recent years. As a response, several international initiatives and parties have called for more transparency in tax reporting, especially by means of a Country-by-Country Reporting.

(2) Certain regulations requiring country-specific information have already been put in place for the extractive and financial sectors. Recently, the OECD and the European

[192] In particular, they propose an apportionment method for those profits that cannot be allocated by transfer pricing.

Commission have additionally presented proposals for a comprehensive disclosure of country-specific tax-related information for companies in all industry sectors.

(3) These proposals envisage CbCR to constitute a separate part of MNEs' transfer pricing documentation. Taxpayers would be obliged to report income, taxes paid and certain indicators of economic activity for each jurisdiction they operate in separately. While the OECD suggests a confidential disclosure of CbCR information to tax authorities, the EU additionally wants to make CbCR – or at least parts of it – publicly available.

(4) Our findings suggest that neither consolidated or individual financial statements nor other existing data sources seem to be an appropriate basis for providing such country-specific information. Instead, it would be necessary to define detailed and harmonized definitions and regulations to ensure comparability. The concept of a CC(C)TB could be a promising avenue in that regard.

(5) The discussion on benefits and costs of a CbCR reveals that benefits (at least partially) lack a theoretical foundation and, overall, do not seem to outweigh associated costs. This holds true, in particular, since current tax planning activities are mainly based on the legal exploitation of gaps and loopholes in national and international tax law. Overall, it appears to be more reasonable to combat tax aggressiveness by means other than CbCR.

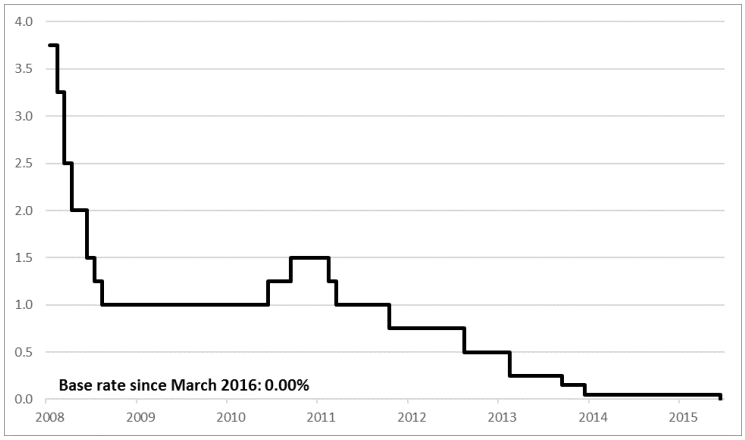
(6) Alternatively, tax legislators should remove gaps and loopholes in tax laws. Specifically, the enforcement of national and international tax rules should be considered. This is in accordance with recent empirical evidence demonstrating the effectiveness of thin-cap rules and tightened transfer pricing regulations.

4.3 Low Interest Environment, Tax Accounts and Business Taxation

4.3.1 Introduction

Since the 2008 global financial crisis, the interest rate level has been subject to a substantial decrease. While the average yield (measured by the yield on long-term government bonds) was at about 4% in summer 2008, it is now close to zero. Similarly, the European Central Bank (ECB) has steadily reduced the base rate since October 2008 (Figure 8).[193]

Figure 8: The ECB's base rate



Corporations and legislators alike have to ask themselves how these low interest rates will impact on taxation and whether they are a call for tax-political action. It is therefore the aim of this paper to identify and analyze the interdependencies between the current phase of low interest rates and the various tax dimensions. In this regard, three major subjects can be differentiated, which will be examined in detail subsequently: Firstly, in chapter 4.3.2, the direct effects of the interest expense on taxable profits of corporations – nationally as well as internationally – are highlighted. Subsequently, chapter 4.3.3 focuses on interest and liquidity effects of taxation. The impact on tax accounting policy in general as well as on a potential harmonization of the corporate tax base in the European Union (EU) will be addressed therein. Chapter 4.3.4 considers the repercussions caused by the low interest environment on the valuation of provisions under German Generally Accepted Accounting Principles (GAAP) (*Handelsgesetzbuch (HGB)*) and tax accounting (*Körperschaftsteuergesetz (KStG); Gewerbesteuergesetz (GewStG)*) as well as the resulting book-tax differences. Based on this assessment, potential reform actions will be identified. The paper closes with a conclusion in chapter 4.3.5.

[193] Source: https://www.ecb.europa.eu/stats/monetary/rates/html/index.en.html, last update: March 2016.

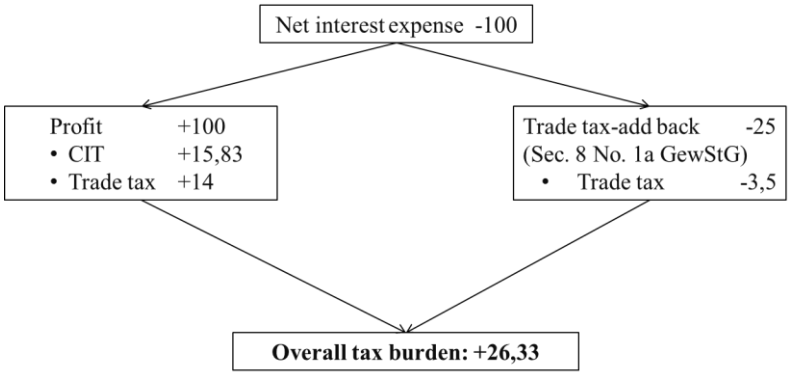
4.3.2 Direct Effects of the Interest Expense

During a continuous period of low interest rates, debt financing generally becomes less costly in a historical comparison (Wobbe and Gutzmann (2015), p. 491). This directly affects the interest payments made by corporations to creditors and leads to a lower overall interest expense for an average corporation, resulting in an improved liquidity.[194] Due to the decrease in deductible expenses, the taxable profit will increase accordingly, inducing a higher corporate income tax (CIT) burden. Consequently, a low interest rate environment improves the financial performance of an average corporation and thus results in a higher CIT burden.

In Germany, decreasing interest rates additionally influence the trade tax burden (*Gewerbesteuer (GewSt)*). According to Sec. 8 no. 1a GewStG, a quarter of charges related to debt financing is added back onto the trade tax base. Lower interest rates will thus lead to a decrease in this add-back (25% of the interest expense) and ultimately to a lower trade tax burden.

The total effect on taxable profits and the overall tax burden of corporations in Germany can be illustrated based on the following simplified example (Figure 9), assuming a reduction in net interest expense of 100 monetary units (MU).

Figure 9: Example to illustrate the direct effects of the decreased interest expense on the total tax burden of a corporation in Germany



Based on the assumption that a German corporation's net interest expense in the low interest environment will be reduced by 100 MU, a higher CIT (incl. solidarity surcharge [SolZ]) and trade tax burden of 29.83 MU (=15.83 + 14) will result.[195] At the same time,

[194] This assumes that the interest expense of an average corporation (e.g. no banks) exceeds its interest income. For further details regarding a representative European corporation for the EU-28 based on the Amadeus-database see European Commission (2015b), p. 67.

[195] For simplicity, a trade tax factor of 400% will be assumed. Further taxes will not be considered in the example.

the interest expenses added back onto the trade tax base will be reduced by 25 MU, lowering the overall tax burden by 3.5 MU. In total, a reduction in the net interest expense of 100 MU results in an increase in the tax burden of 26.33 MU.

In addition to the direct effects on the after-tax profit, the interest rate will also affect the applicability of restrictions regarding the deductibility of interest. According to the German earnings stripping rule (Sec. 4h EStG i.c.w. Sec. 8a KStG), interest expenses exceeding taxable interest income are only deductible at up to 30% of Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA) (Jacobs et al. (2016), p. 280). Additionally, the German regulation grants an exemption limit of EUR 3 mn for net interest expenses. At an (historical) interest rate of 5%, this resulted in a maximum value of (net) liabilities of EUR 60 mn. A lower interest rate of 2% increased this amount to EUR 150 mn. Evidently, in a low interest environment, restrictions on interest deductibility are applicable in fewer cases and are, thus, less important.

Nevertheless, low interest rates will not only influence domestic taxation, but also entail implications for the tax planning of multinationals. As outlined above, profits as well as tax burdens will generally increase in the respective country of residence. At the same time, interest on intracompany debt will decrease, as the interest levied on such loans has to be comparable to transactions between independent parties based on the arm's length principle (BMF letter dated 23 February 1983, p. 218; Jacobs et al. (2016), p. 712 f.). The prevailing incentive to fund subsidiaries in high-tax countries with debt capital, as the deduction of interest is most effective where tax rates are high, will be decreased accordingly (Jacobs et al. (2016), p. 946 f.). Financing and preferential tax regimes, such as an allowance for corporate equity as currently in place in Belgium and Italy, enabling corporations to deduct a notional interest on equity, generally become less favorable. The ability to engage in tax planning using traditional tax planning instruments (debt financing in particular) will thus be restrained and profit shifting from high- to low-tax countries becomes more difficult. Hence, the tax burden in the country of residence is of increasing relevance for location and investment decisions.[196] It remains to be seen if other business models, such as leasing[197] and licensing,[198] will gain in importance in the future.

[196] Regarding the interdependency of location decision and local tax burden see Devereux and Griffith (2003); Feld and Heckemeyer (2011).
[197] For further details see Jacobs et al. (2016), p. 1265ff, 989 f.
[198] For further details see Jacobs et al. (2016), p. 1110 ff.

4.3.3 Interest and Liquidity Effects

In general, corporations have an incentive to use tax accounting policies to distribute their profits, and thus their tax bases, over several years in an optimal way such that the present value of tax payments is minimized. The most important instruments to do so are tax accounting options as well as reporting leeway.[199] In the German tax code such legal options include depreciation and amortization schedules as well as inventory valuation.[200] Leeway is not explicitly regulated, de facto resulting from vague legal terms and unclear legal situations respectively, both requiring judgement and interpretation. An example of this is the (subjective) estimation of a machine's useful life.

Generally, tax accounting policies create a temporary advantage through tax deferral as well as a greater liquidity in early periods, but do not lead to sustainable tax savings. Over the entire life of a corporation, the tax in- and decreases will usually offset each other. The following example (Table 21) is intended to clarify the potential interest and liquidity effects in tax accounts:

A-GmbH (a German Ltd.) acquires a machine with a useful life of four years for EUR 100 k on 01/01/t_1. For tax purposes, A-GmbH has the option to conduct a special depreciation in accordance with Sec. 7g EStG in the year of acquisition (20% of the acquisition costs in addition to the regular depreciation). The uniform tax rate amounts to 50% for the entire time horizon. Excluding this record, a pre-tax profit of EUR 200 k has been recorded.

[199] For further details see Scheffler (2013), p. 218 f. Since the German Accounting Law Modernization Act has entered into force in 2010, this incentive has been even further amplified, as it is possible, for the first time, to exercise tax accounting options independently from financial accounts (abolishment of the reverse authoritative principle); see Scheffler (2013), p. 228 f.

[200] For further details see Hayn et al. (2009), p. 12 f.: According to Sec. 7 EStG, there is, for example, the right to choose between straight-line, declining balance and performance-related depreciation.

Table 21: Example for interest and liquidity effects in tax accounts

	31/12/t_1	31/12/t_2	31/12/t_3	31/12/t_4
Pre-tax profit	**200**	**200**	**200**	**200**
Depreciation without special amortization (a)	25	25	25	25
Depreciation with special amortization (b)	45	18.33	18.33	18.33
Taxable profit (a)	175	175	175	175
Taxable profit (b)	155	181.67	181.67	181.67
Tax burden (a)	**87.5**	**87.5**	**87.5**	**87.5**
Tax burden (b)	**77.5**	**90.84**	**90.84**	**90.84**
Difference (b)-(a)	**10**	**-3.34**	**-3.34**	**-3.34**

This example demonstrates that, due to the additional special amortization of EUR 20 k in t_1, the taxable profit will be reduced and the tax burden in the first period decreases by EUR 10 k (=0.5*EUR 20 k). Considering the entire useful life of the machine, the tax saving is offset by a constant increase in taxes payable of EUR 3.34 k per year from t_2 through t_4, due to the annual reduction in depreciation allowance of EUR 6.66 k. The taxpayer obtains, due to the greater availability of funds in the first period, a liquidity advantage of EUR 10 k. A potential interest advantage arises from the (additional) opportunity to invest this amount. However, this effect decreases with falling (market) interest rates.

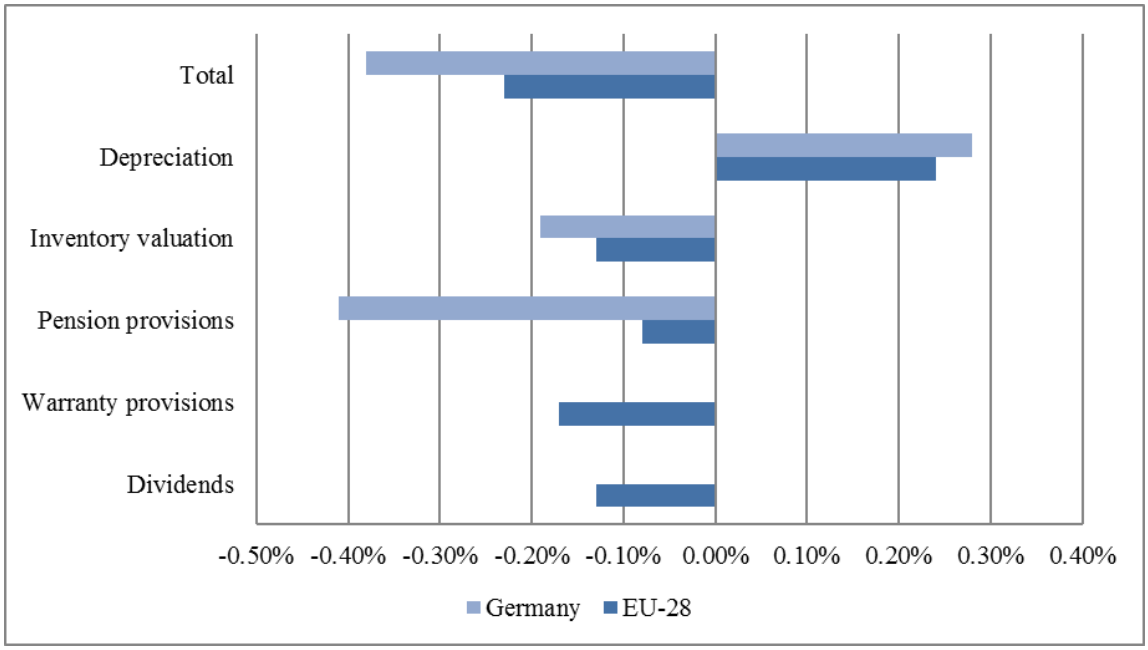
The interest advantage, as highlighted above, will be lower than in the past due to the decrease in the interest rate level. Hence, temporary periodization effects lose in importance (Anzinger (2016a), p. 1767). To sum up, it can be concluded that the demonstrated means of tax accounting policy fundamentally become less relevant when interest rates are low. Thus, the outlined tax sheltering incentives (see chapter 3) become less pronounced.

The fact that periodization effects take a backseat (due to the low interest rate level) impacts in addition on the chances of success of a harmonization of the corporate tax base in the EU. Since the European Commission (EC) presented a first draft directive (DD) for a „Common (Consolidated) Corporate Tax Base (CC(C)TB)“ in 2011 (European Commission (2011)), the concept consistently reappeared on the political agenda.[201] The current discussion is mainly focused on the first step; an EU-wide harmonization of the tax base and the corresponding norms. This has also been expressed by the recently

[201] See latest EU action plan dated 06/17/2015, European Commission (2015a).

published revised DD for a CC(C)TB (European Commission (2016e, 2016f)). Fundamentally, the proposed concept to determine taxable profits, except for several matters of detail that still need to be resolved,[202] can be accepted, as it seems to be compatible with the tax systems of the member states.[203] Fiscal consequences for the member states can thus be expected to be low. A current quantitative assessment of the effective tax burdens of corporations in all 28 EU-member states, using the European Tax Analyzer (ten-period-consideration), shows that the profit determination in accordance with the 2011 DD would trigger only small changes in tax burdens compared to current domestic legislations (see Figure 10: EU-wide: -0.23%, Germany: -0.38%).[204] The most significant periodization differences persist with regard to depreciation allowances, inventory valuation as well as recognition and valuation of provisions.

Figure 10: Change in effective tax burden related to the introduction of the DD and isolated impact of single regulations



As these periodization differences become less important in the current low interest rate environment, the tax effects of an introduction of a CC(C)TB would be further reduced. This could in turn lead to an improved acceptance in the member states and thus to a higher political enforceability, provided that a CC(C)TB, in addition to an increase in transparency of corporate taxation in the EU, promises further advantages (Scheffler and Köstler (2014b)).

[202] See chapter 4.1; Evers et al. (2015).
[203] For further details see Spengel and Zöllkau (2012).
[204] For further details see Evers et al. (2015), p. 369 ff.

4.3.4 Discounting of Liabilities in Financial and Tax Accounts

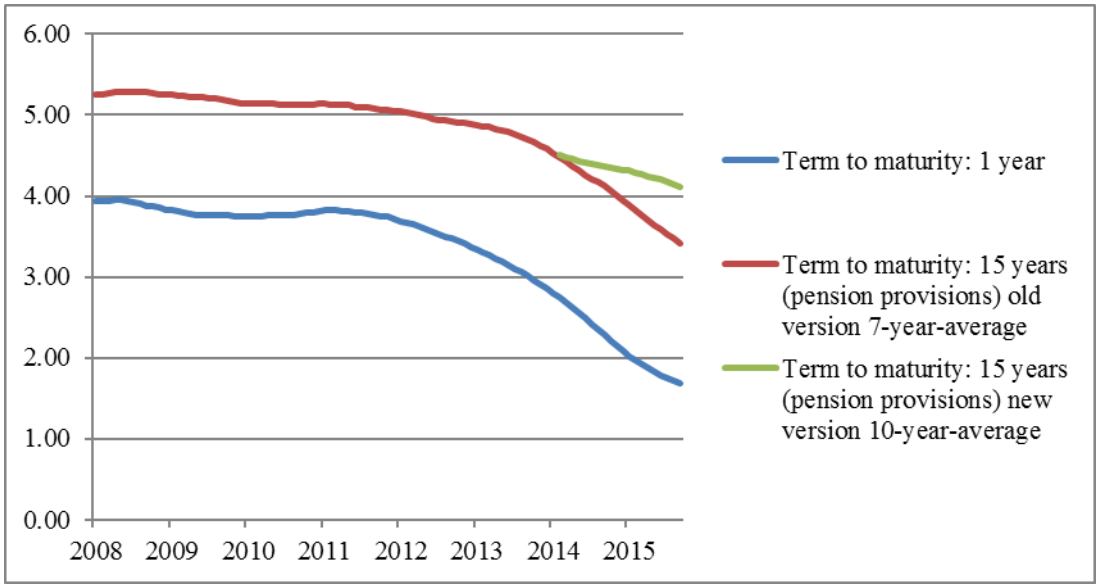
4.3.4.1 Status Quo

The low interest rate environment influences the discounting of balance sheet provisions in accordance with GAAP and tax law as well as the resulting book-tax differences. While provisions have to be depreciated at a fixed rate independent of the current market environment according to tax law, i.e. provisions with a term to maturity of more than one year at 5.5% (Sec. 6 par. 1 no. 3a EStG) and pension provisions at 6% (Sec. 6a par. 3 EStG), the actuarial interest rate according to HGB is floating, based on the market interest rate. Pursuant to Sec. 253 par. 2 HGB, provisions with a term to maturity of more than one year have to be discounted at the appropriate, i.e. the interest rate for similar maturities, average market interest rate over the past seven years. Pension provisions and retirement benefits can be discounted at the average market interest rate, assuming a standardized term to maturity of 15 years. Recently, the German federal cabinet decided on a change in the valuation of pension provisions on 27 January 2016, extending the calculation of the average to the last 10 years.[205] The regulation is supposed to take effect for business years ending after 31 December 2015, but can optionally be applied retrospectively for the business year 2015. The following figure (Figure 11)[206] depicts the development of the actuarial interest rate since 2008. Due to the averaging involved in the computation, the low actuarial interest rate has a delayed effect on German financial accounts. Since 2012, this discount rate has been subject to a notable decrease, and currently amounts to 1.69% (term to maturity of one year) as well as 4.11% (new version: 10-year-average) and 3.42% (old version: 7-year-average) respectively for pension provisions.

[205] See Gesetz zur Umsetzung der Wohnimmobilienkreditrichtlinie und zur Änderung handelsrechtlicher Vorschriften dated 03/11/2016, BGBl I 2016, p. 396; for further details see Zwirner (2016), p.1.

[206] Source: https://www.bundesbank.de/Navigation/DE/Statistiken/Zeitreihen_Datenbanken/Geld_und_Kapitalmaerkte/geld_und_kapitalmaerkte_node.html, last update: September 2016.

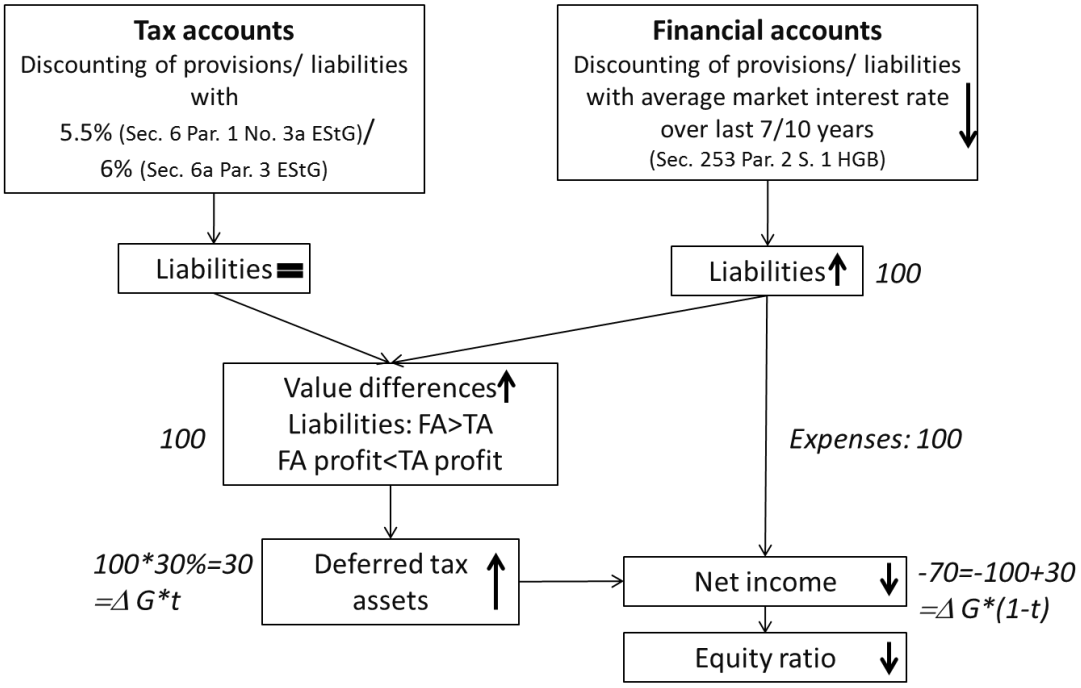
Figure 11: Actuarial interest rate according to Sec. 253 par. 2 HGB



While the plummeting interest rates do not have an effect on the present value of liabilities in tax accounts, they cause an increase in value for liabilities in financial accounts. The related expenditures have to be considered in the profit and loss statement, ultimately reducing the net income (and potentially lowering the equity ratio) (Wobbe and Gutzmann (2015), p. 490). At the same time, the disparate valuation in financial and tax accounts leads to an increase in book-tax differences (liabilities in financial accounts > liabilities in tax accounts) and therefore the emergence of deferred tax assets. The recognition of this balance sheet item is, in accordance with Sec. 274 HGB, optional. Exercising the option has a positive effect on the annual profit according to financial accounts, as deferred tax revenues will be recorded (compensation for the greater tax revenue and expense respectively). However, Sec. 268 par. 8 HGB includes a payout block equal to the amount of net recognized deferred tax assets (Geberth (2015), p. 18).

The following figure (Figure 12) depicts the interdependencies between discounting for tax and financial accounting purposes in a low interest environment using a simplified example (excess liabilities in financial accounts due to discounting: 100 MU; tax rate: 30%). It demonstrates that the expense, resulting from the increased settlement value in financial accounts, directly influences net income (-100 MU). At the same time, deferred tax revenue (30 MU) – provided that the option to capitalize deferred tax assets is exercised – offsets the reduction in profits at least partially (net impact: -70 MU). This profit is, however, as mentioned above, subject to a payout block.

Figure 12: Interdependencies between discounting for financial and tax account purposes in a low interest rate environment



The demonstrated interdependencies have to be evaluated critically for several reasons. Firstly, it has to be mentioned that the low interest rate environment – due to the fixed discounting for tax accounts – only entails very limited liquidity effects. The changes in value of financial balance sheet items are not recorded on the tax balance sheet and thus the tax burdens of corporations are not reduced (Wobbe and Gutzmann (2015), p. 490; Anzinger (2016a), p. 1772). Hence, the taxation of profits will be too high as compared to distributable profits, which are reduced due to the increased book value of provisions. Furthermore, the potentially increased value of deferred tax assets can introduce problems. If these turn out not to be realizable in future periods (e.g. due to insufficient profits), the firm's equity is threatened (Ehrmann and Kühnapfel, FAZ 04.01.2016; Kröner and Beckenhaub (2008), p. 13 and 20f; Prinz and Keller (2016b), p. 1033ff). In conclusion, the actuarial interest rate for tax purposes of 5.5% and 6% respectively can be considered as significantly too high relative to the current market environment. Factual obligations – for long term provisions in particular – are thus not represented in correspondence to their actual economic substance and, due to undervaluation, a risk of hidden charges on the tax balance sheet exists (Prinz and Keller (2016a), p. 313).[207]

[207] Geberth (2015), p. 18: The measurement of pension provisions according to IFRS is, for example, often about 100% higher than the obligation according to tax accounts.

From a conceptual and economic point of view, a reduction in the actuarial interest rate would be necessary. This could, however, be opposed to fiscal-political interests: Geberth (2015), for example, estimates that a reduction in the actuarial interest rate for pension provisions by 1 percentage point (to 5%) would increase book values by about 15%, i.e. EUR 41 bn. This in turn would lead to a onetime reduction in tax revenue of about EUR 10 bn,[208] which would be difficult to enforce politically.

4.3.4.2 Reform Considerations

In the following, considerations regarding potential reforms, aimed at accounting for an appropriate actuarial interest rate for tax purposes, while at the same time also being practicable and fiscal-politically acceptable, will be presented. Furthermore, these proposals seek to reduce the demonstrated book-tax differences as well as the related problems resulting from the disparate discounting regulations.

In view of an appropriate actuarial interest rate for tax purposes, the first question that needs to be answered is whether this interest rate should be of fixed or of floating nature. It can be held in favor of a fixed interest rate, as it is currently part of the German tax code, that it is associated with planning and legal certainty for corporations. Additionally, a fixed interest rate is coherent with respect to the principle of continuity of the taxable profit and guarantees formal comparability and absence of arbitrariness by introducing a (materially) homogeneous determination of profits for subsequent fiscal years (Herzig (2004), p. 25 f.). In contrast, a floating interest rate would rather meet the economic calculation of values, allowing for opportunity costs and the alternate use of funds respectively to be recorded, as the flexible interest rate would reflect the current market environment. Furthermore, experience and practice have shown that the actuarial interest rate for tax purposes does not necessarily have to be fixed but can well be floating, e.g. based on the borrowing rate. In 1960, for example, the discount rate for pension provisions was increased from 3.5% (since 1955) to 5.5% ("Steueränderungsgesetz 1960") (Law of 30 July 1960, p. 617) and later to 6% ("zweites Haushaltsstrukturgesetz 1981") (Law of 22 December 1982, p. 1523). Similarly, the EC's proposed CC(C)TB-DD includes a variable interest rate for long-term provisions, based on the 12M-Euribor average (2015: 1.68%) (European Commission (2011), Art. 25 par. 2 l. b). Thus, it can be concluded that it is certainly possible to implement a floating actuarial interest rate for

[208] This calculation is based on an average corporate income tax rate of less than 30%.

tax purposes (as already applied for financial accounting purposes) and that this is, considering the current market environment, even necessary.

Furthermore, it has to be considered which interest rate, i.e. debit or credit interest rate, should be used as a basis for the actuarial interest rate. According to the explanatory memorandum to the 1960 tax code amendment, the recognition of pension provisions involves tax and financial advantages; as corporations have the ability, by recognizing pension provisions, to employ temporary funds for investments that could have otherwise not been undertaken or only by a drawdown of loans (internal financing) (BT-Drucks. III/1811, p. 9). Consequently, the current reasoning is rather based on the assumption of capital substitution. Proceeding from this viewpoint, a debit interest rate that, for example, is oriented at the yield of long-term commercial bonds would be appropriate. In contrast, the reasoning related to financial accounting rather assumes capital accumulation. This is based on the argumentation that capital tied up in provisions is available for additional investments, leading to realizable revenues (IDW (2009), p. 82). Therefore, the interest rate should at least amount to the return the respective corporation could realize with the capital bound in provisions in the long-term. Oftentimes, these tied funds are held at high liquidity to finance employee pensions. Based on this view, a credit interest rate, i.e. the interest rate on long-term investments at the capital market, would be appropriate.[209]

As capital substitution and accumulation usually occur simultaneously in a corporation, a mixed interest rate, based on debit and credit interest rates, would be appropriate to discount provisions.[210] The current actuarial interest rate for financial purposes already includes such a mixed interest rate (Anzinger (2016b), p. 1830). It is presently based on a zero-coupon-Euro interest-rate swap curve plus a markup for corporate bonds of all maturities with high-class credit ratings denoted in Euro (Sec. 2 RückAbzinsV).[211] The actuarial interest rate for tax purposes could conceptually well be oriented at the floating rate for financial purposes. Similarly, a multi-period view of 10 years for pension provisions and a 7-year-view for all other provisions (Sec. 253 par. 2 HGB) would be appropriate for the tax actuarial interest rate to eliminate revenue fluctuations that are not

[209] For more on capital substitution and capital accumulation for pension provisions, see Spengel (1995), p. 187 f.

[210] This approach was basically also followed in the explanatory memorandum to the 1960 tax code amendment, see BT-Drucks. III/1811, 9; Prinz and Keller (2016b), p. 1033 ff.

[211] Advantages of a zero-coupon-Euro interest-rate swap curve are i.e. the range of maturities, low influences due to fluctuations in demand, the liquidity of the markets as well as the validity for the whole eurozone. A calculation of the yield curve exclusively based on corporate bonds with high-class credit ratings denoted in Euro especially with long-term maturities would entail major uncertainties, see IDW (2009), p. 82.

rooted in a corporation's business (IDW (2009), p. 82). It can therefore be drawn as an interim conclusion that the alignment of the tax actuarial interest rate to the financial actuarial interest rate would be reasonable.[212] This furthermore entails the advantage of reducing book-tax differences.

To improve the fiscal-political enforceability of such an alignment, regulations for transitional and onetime effects related to the current value of provisions in tax accounts would need to be established. It may be conceivable to gradually reduce the tax actuarial interest rate to match the corresponding interest rate under GAAP (e.g. 0.5% or 1% per year) instead of performing an over-night-transition. Table 22 demonstrates such a stepwise implementation using the example of pension provisions.

Table 22: Stepwise alignment of the actuarial interest rate for tax accounting purposes to the discount rate of financial accounting

Pension prov.	**Status Quo**	**Year$_1$**	**Year$_2$**
Financial Accounts	4.11%	+/- 4.11%	+/- 4.11%
Tax Accounts	6%	5%	+/- 4.11%
Revenue effects		**approx. -10 bn. €**	**…**
Effects on profits		**approx. -40 bn. €**	**…**

Based on Geberth (2015), an assumed reduction in the discount rate for tax purposes of 1% in Germany would trigger a decline in corporate profits of approx. EUR 40 bn and of EUR 10 bn in tax revenues. These consequences would not be acceptable for neither corporations nor tax authorities. A high, onetime revenue reduction can, in some cases, result in (after-tax) losses that, due to the minimum taxation (Sec. 10d par. 2 EStG), are only of limited use in future periods or, in case of a change in ownership, can get lost (Sec. 8c KStG). The fiscal authority will not be willing to accept such exceptionally high onetime losses, even if additional revenues in the future, due to the lower actuarial interest rate, are likely to have an offsetting effect.

The fiscal impact, i.e. the profit and revenue effects related to the current book value of pension provisions, could therefore be stretched over a longer time horizon by introducing further transitional regulations. This would, for example, be possible by recording a prepaid expense, i.e. a profit increasing item, in tax accounts that would be reversed over

[212] This corresponds with the opinion of the Arbeitskreises Bilanzrecht Hochschullehrer Rechtswissenschaft; see Giersberg, FAZ, 02/15/16.

10 years as an expense.[213] In doing so, the determination of the exact timeframe would be a political decision. In case of an increase in the actuarial interest rate in the future, an analogous procedure would be appropriate.

4.3.5 Summary

(1) Due to the low interest levels, corporations' net interest expenses are decreasing, increasing pre-tax profits as well as tax burdens.

(2) Furthermore, international tax planning using traditional channels (debt financing in particular) as well as tax accounting policies lose in importance.

(4) The reduced relevance of periodization effects leads, in addition, to a potentially higher political enforceability of an EU-wide harmonization of the corporate tax base.

(5) Given that the actuarial interest rate for tax accounts is kept fixed at the current level, book-tax differences will increase. This (potentially) leads to an increase in the amount of deferred tax assets. From a conceptual and economic point of view, a reduction in the actuarial tax interest rate would be necessary.

(6) A gradual alignment of the tax actuarial interest rate to the moving average actuarial interest rate for financial accounting purposes can be justified. In this case, onetime effects (profit and tax revenue effects) can be mitigated by stretching the transition period. The determination of the timeframe in this context is a political decision. In case of a future increase in the actuarial interest rate, an analogous procedure would be appropriate.

[213] See for the reversed application: profit-decreasing reserve in the course of the „Steuerentlastungsgesetz 1999/2000/2002“ to the first-time discounting of provisions.

5 Conclusions

(1) The general book-tax conformity (BTC) discussion has triggered a huge body of tax accounting literature, especially in the US. We have identified two major interrelated strands dealing with the association between book-tax conformity and opportunistic reporting behavior, which have been surveyed in chapter 2: The first one examines whether book-tax differences actually are indicative of aggressive reporting. In the second strand, it is analyzed which particular drivers impact on book-tax differences (BTD) and on earnings management (EM)/tax sheltering (TS), respectively.

(2) As a first step, the systematic literature review reveals great heterogeneity in measures applied. While the majority of studies use a rough estimate of the book-tax gap, other investigations exploit more precise proxies or use measures for BTC by means of cross-country studies. Moreover, only a minority of investigations is based on actual tax return data, while most studies have to rely on measures of tax variables estimated from financial accounts. Similarly, there are numerous variables used to capture EM and/or TS.

(3) In a second step, we employ meta regression analysis (MRA) as an innovative tool in the empirical accounting literature to derive a consensus estimate in terms of the sign and statistical significance level on the association between BTD/BTC and opportunistic reporting behavior (first strand of literature). Our MRA results point to a statistically significant and positive association between BTD and EM/TS, indicating that BTD are indeed indicative of both EM and TS, and even more so of EM. This association is, however, less pronounced for studies that only capture BTD roughly instead of using more precise proxies. Moreover, examining actual BTD computed from tax returns instead of only approximating them from financial statements strongly increases the effects. Even though we cannot draw a definite conclusion with regard to BTC, our results as well as the alleged inverse correlation between BTC and BTD suggest a negative association between BTC and EM/TS. We interpret this as a first indicator for higher conformity being indeed effective in reducing aggressive reporting.

(4) For the second strand of literature, we derive insights on the direction and significance of the major drivers of BTD. We provide evidence for a positive impact of *profitability*, the *NOL dummy*, *leverage*, *PPE*, *capital intensity*, *R&D expenses*,

accruals and *foreign operations* on BTD by using the Stouffer combined test. Therefore, we conclude that these variables are positively related to increased levels of EM and/or TS and should certainly be taken into account in future studies on this topic. Our results are not entirely unambiguous with regard to *intangibles*, *equity income in earnings*, *Big 4 dummy*, and *institutional ownership*. In terms of *size* and *liquidity*, we conclude that our results are indicative of a negative association with EM/TS, given that we consistently find negative results in relation to more precise BTD measures. Hence, it can be concluded that it is essential to choose an appropriate BTD measure for the respective research question at hand.

(5) Building on the insights provided in chapter 2, we conduct an own empirical analysis (chapter 3) to contribute to the ongoing book-tax conformity debate. Firstly, we take into account that our MRA results have shown that efforts taken to accurately determine BTD seem to be worthwhile when it comes to the explanatory power for opportunistic reporting. Therefore, our study builds on a unique dataset of linked individual financial statements and actual tax return data for 150 incorporated firms in a panel including the years 2008 to 2012. Secondly, our MRA results can only provide a first hint that higher conformity is indeed effective in reducing aggressive reporting. To substantiate this finding, we examine how a real change in book-tax conformity affects firms' reporting behavior. To this end, we exploit the Accounting Law Modernization Act as a quasi-natural experiment which implied a decrease in book-tax conformity in Germany in 2010. In particular, this reform allows firms to exercise tax accounting options independently from financial accounting.

(6) In our empirical analysis, we directly exploit the 2010 Reform Act in a difference-in-differences regression approach. Our results show that companies actually use the newly introduced reporting leeway to manage taxable income downwards despite of additional documentation costs. More precisely, we find that profitable companies which have a clear tax sheltering incentive exhibit comparably higher (positive) book-tax differences subsequent to the decrease in conformity. This is especially attributable to companies exploiting favorable tax depreciation rules. Moreover, we find larger opportunistic tax reporting responses for small companies with less complex and predominantly domestic group structures. Finally, we observe that a decrease in book-tax conformity induces a decrease in the general persistence of taxable income, but at the same time gives rise to higher financial

earnings persistence. This corroborates our finding that the increase in book-tax differences is due to tax sheltering rather than earnings management.

(7) In terms of the core research question of this dissertation and the policy contribution, our results show that the discretion for opportunistic reporting in a low conformity system is indeed exploited despite additional documentation requirements. This finding supports the position of proponents of increased book-tax conformity and is consistent with the results of chapter 2 which indicate that book-tax conformity is indeed effective in reducing opportunistic reporting. At the same time, we show that detaching financial and taxable income increases the persistence of financial income, thus suggesting an increased information content of financial earnings in a two-book system. This finding is in line with the arguments put forward by the opponents of increased conformity, who maintain that both accounting lines provide divergent information content parts of which are lost in case of an alignment. Thus, we would propose to either fully align financial and tax accounts (one-book system) which might possibly come along with a loss of information or to induce a two-book system without any (tax) accounting options and discretion to effectively curb opportunistic reporting behavior.

(8) The implementation of the first step of a Common (Consolidated) Corporate Tax Base (CC(C)TB), i.e. a harmonization of the determination of taxable profits in Europe, would induce such a full detachment of tax accounting from financial accounts and, thus, a transition to a two-book system in all European countries. The proposed CCTB rules lack, however, detailed definitions of legal terms such that there are still numerous regulatory gaps as well as discretion in reporting which cannot be eliminated by referring to national (civil) laws. As discussed, this would leave room for tax sheltering and, therefore, not comply with our recommendation. A possible solution would be to base the harmonization of the tax base in Europe on a cash flow-oriented taxation/modified net income method (chapter 4.1). This concept would gear the profit determination more strongly towards the cash-principle and limit accrual accounting and periodical adjustments as far as possible. In some areas, the CCTB rules are already in line with the principles of a cash flow-oriented taxation (e.g. periodization of long-term liabilities). Further adaption is necessary, in particular regarding the cash-principle, the abolishment of existing accounting options and discretion as well as the specification of undefined legal terms. These changes and thus a greater movement towards a more strongly cash-

oriented profit determination would lead to more clarity and uniformity as well as to less scope for opportunistic reporting behavior. Furthermore, its stronger orientation towards the taxation practices of the European member states would imply lower tax-related compliance costs as well as a better political enforceability. Material taxation consequences are, in addition, likely to be minor.

(9) In order to further increase transparency in tax reporting in Europe and to limit Base Erosion and Profit Shifting (BEPS), the Organization for Economic Co-Operation and Development (OECD) and the European Commission have put forward several proposals for a Country-by-Country Reporting (CbCR). Our findings (chapter 4.2) suggest that neither consolidated or individual financial statements nor other existing data sources seem to be an appropriate basis for providing such country-specific information. Instead, it would be necessary to define detailed and harmonized regulations to ensure comparability. The outlined concept of a CC(C)TB (chapter 4.1) could be a promising avenue in that regard as well. The discussion on benefits and costs of a CbCR reveals that benefits (partially) lack a theoretical foundation and, overall, do not seem to outweigh associated costs. We, therefore, contend that CbCR does not seem to be a convincing measure to prevent multinationals from profit shifting. Instead, it appears to be more reasonable to combat tax aggressiveness by removing gaps and loopholes in national and international tax laws and by enforcing, for example, thin-cap rules and transfer pricing regulations.

(10) Several market conditions, including the persistent low interest environment, further impact on the various tax (accounting) dimensions (chapter 4.3). First, due to the low interest levels, corporations' net interest expenses are decreasing, increasing pre-tax profits as well as tax burdens. Furthermore, international tax planning strategies using traditional profit shifting channels as well as tax sheltering policies lose in importance. The reduced relevance of periodization effects leads, in addition, to a potentially higher political enforceability of a CC(C)TB in Europe. Given that the actuarial interest rate for tax accounts is kept fixed at the current level in Germany, book-tax differences will increase. From a conceptual and economic point of view, a reduction in the actuarial tax interest rate would be necessary. In Germany, a gradual alignment of the tax actuarial interest rate to the moving average actuarial interest rate for financial accounting purposes could be justified.

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Appendix

Table A- 1: Journal abbreviations

Abbreviation	Journal title
AIA	Advances in Accounting, incorporating Advances in International Accounting
AJPT	Auditing: A Journal of Practice & Theory
CUBR	China-USA Business Review
CAR	Contemporary Accounting Research
EAR	European Accounting Review
IBR	International Business Research
IJAES	International Journal of Accounting and Economics Studies
IJAAPE	International Journal of Accounting, Auditing and Performance Evaluation
IJBM	International Journal of Business and Management
IJEF	International Journal of Economics and Finance
JAE	Journal of Accounting and Economics
JAF	Journal of Accounting and Finance
JAR	Journal of Accounting Research
JAAF	Journal of Accounting, Auditing & Finance
JBF	Journal of Banking and Finance
JBFA	Journal of Business Finance & Accounting
JFE	Journal of Financial Economics
JIFMA	Journal of International Financial Management & Accounting
JATA	Journal of the American Taxation Association
RAR	Research in Accounting Regulation
RAST	Review of Accounting Studies
TAR	The Accounting Review
IJA	The International Journal of Accounting
REST	The Review of Economics and Statistics
WP	Working Paper

Table A- 2: Overview of authoritative principle pre- and post-BilMoG

Commercial code	Tax law	Pre-BilMoG	Post-BilMoG
Compulsory regulation	No regulation	BS = TBS authoritative principle	BS = TBS authoritative principle
Compulsory regulation	Option	BS = TBS authoritative principle (pseudo option)	BS =/≠ TBS (abolishment of reverse authoritative principle)
Compulsory regulation	Compulsory regulation	BS =/≠ TBS precedence of tax law (departure from authoritative principle)	BS =/≠ TBS precedence of tax law (departure from authoritative principle)
Option	Compulsory regulation	BS =/≠ TBS precedence of tax law (departure from authoritative principle)	BS =/≠ TBS precedence of tax law (departure from authoritative principle)
Option	No regulation	BS =/≠ TBS authoritative principle *	BS =/≠ TBS authoritative principle *
Option	Option	BS = TBS reverse authoritative principle	BS =/≠ TBS (abolishment of reverse authoritative principle)

Note: This table provides an overview of the impact of the (reverse) authoritative principle with regard to potential deviations between financial and tax accounting, pre- and post-reform.

Table A- 3: Overview of accounting items with BTD pre- and post-BilMoG

Assets

				Deviations				
				Deviation		**deterministic/discretionary**		**divergence/ convergence**
Balance sheet item	**German GAAP pre-BilMoG**	**German GAAP post-BilMoG**	**Tax Balance Sheet**	pre-BilMoG	post-BilMoG	with regard to financial accounting	with regard to tax balance sheet	*
Fixed Assets								
Intangible assets								
Internally created intangible assets	Capitalization prohibited	Option to capitalize	Capitalization prohibited	no	possible	discretionary	deterministic	divergence
Derivative goodwill	Option to capitalize	Capitalization required	Capitalization required	possible	no	deterministic	deterministic	convergence
Tangible assets								
Buildings	Subsequent costs of acquisition: capitalization required (irrespective of distance of time and amount of costs relative to initial acquisition)	Subsequent costs of acquisition: capitalization required (irrespective of distance of time and amount of costs relative to initial acquisition)	Expenses for maintenance/modernisation within 3 years after acquisition and in excess of 15% of initial expenses: capitalization required	possible	possible	deterministic	deterministic	-
Low-value assets	≤ 150 EUR: immediately expensed; or capitalization and deprecation (useful life) > 150 EUR, ≤ 410 EUR: immediately expensed; or capitalization and deprecation (useful life); or pool depreciation (5 years) (only if not material) > 410 EUR, ≤ 1.000 EUR: capitalization and deprecation (useful life); or pool depreciation (5 years) (only if not material)	≤150EUR: immediately expensed; or capitalization and deprecation (useful life) > 150 EUR, ≤ 410 EUR: immediately expensed; or capitalization and deprecation (useful life); or pool depreciation (5 years) (only if not material) > 410 EUR, ≤ 1.000 EUR: capitalization and deprecation (useful life); or pool depreciation (5 years) (only if not material)	≤150EUR: immediately expensed; or capitalization and deprecation (useful life) > 150 EUR, ≤ 410 EUR: immediately expensed; or capitalization and deprecation (useful life); or pool depreciation (5 years) > 410 EUR, ≤ 1.000 EUR: capitalization and deprecation (useful life); or pool depreciation (5 years)	no	possible	discretionary	discretionary	divergence
Financial assets								
Shares in affiliated companies								

Shares in partnerships Recognition	Acquisition costs	Acquisition costs	Distinct, divergent valuation method ("mirror image method")	yes	yes	deterministic	deterministic	-
Subsequent measurement	Permanent impairment: write-down required; non-permanent impairment: write-down optional	Permanent impairment: write-down required; non-permanent impairment: write-down optional	Write-down prohibited	possible (non-permanent impairment)/ yes (permanent impairment)	possible (non-permanent impairment)/ yes (permanent impairment)	discretionary (non-permanent impairment) /deterministic (permanent impairment)	deterministic	-
Current assets								
Inventories								
Simplifying valuation methods	Fifo, Lifo, Hifo; weighted average	Fifo, Lifo; weighted average	Lifo; weighted average	no	possible	discretionary	discretionary	divergence
Receivables								
Dividend receivables	Capitalization required (under certain conditions)	Capitalization required (under certain conditions)	Capitalization prohibited	yes	yes	deterministic	deterministic	-
Bad debt allowance	Permanent impairment: write-down required; non-permanent impairment: write-down optional	Permanent impairment: write-down required; non-permanent impairment: write-down optional	Permanent impairment: write-down optional; non-permanent impairment: write-down prohibited	no (permanent impairment) / possible (non-permanent impairment)	possible	discretionary	deterministic (non-permanent impairment)/ discretionary (permanent impairment)	divergence
Production costs								
Materials and production overhead; depreciation	Option to capitalize	Capitalization required	Capitalization required	possible	no	deterministic	deterministic	convergence
General administration costs, expenses for social purposes, voluntary social benefits, company pension scheme	Option to capitalize	Option to capitalize	Option to capitalize	no	possible	discretionary	discretionary	divergence
Interest	Option to capitalize	Option to capitalize	Option to capitalize	no	possible	discretionary	discretionary	divergence
Research and distribution costs	Capitalization prohibited	Capitalization prohibited	Capitalization prohibited	no	no	deterministic	deterministic	-
Depreciation								
General principles	Rational commercial judgment (no statutory specification of method); switch from declining balance method to straight line depreciation possible	Rational commercial judgment (no statutory specification of method); switch from declining balance method to straight line depreciation possible	Straight line (useful life; indication: "AfA-Tables") or unit-of-production method; declining balance method applicable only until 31.12.2010	no	possible	discretionary	discretionary	divergence

Fixed assets							
Intangible assets	Depreciation according to expected useful life (< 20 years; straight line method unless another method is better suited to the usage pattern) straight line (4 years) or straight line (useful life)	Depreciation according to expected useful life (< 20 years; straight line method unless another method is better suited to the usage pattern) straight line 5 years (otherwise justification necessary)	Straight line method (useful life) Straight line, 15 years	possible possible	possible possible	discretionary discretionary	deterministic (method), discretionary (length of useful life) deterministic	- -
Goodwill								
Tangible assets	Rational commercial judgment	Rational commercial judgment	Straight line (useful life; indication: "AfA-Tables") or unit-of-production method; declining balance method applicable only until 31.12.2010	no	possible	discretionary	discretionary	divergence
Buildings	Rational commercial judgment	Rational commercial judgment	Straight line (33-50 years)	possible	possible	discretionary	deterministic	-
Exceptional depreciation								
Fixed assets								
Non-permanent impairment	Write-down optional (companies of certain legal status: only in case of financial assets)	write-down optional (but limited to financial assets)	Write-down prohibited	possible	possible (financial assets)	discretionary	deterministic	-
Permanent impairment	Write-down required	Write-down required	Write-down optional	no	possible	deterministic	discretionary	divergence
Current assets								
Non-permanent impairment	Write-down required ("strict lowest value principle")	Write-down required ("strict lowest value principle")	Write-down prohibited	yes	yes	deterministic	deterministic	-
Permanent impairment	Write-down required ("strict lowest value principle")	Write-down required ("strict lowest value principle")	Write-down optional	no	possible	deterministic	discretionary	divergence
Special tax depreciation	Reverse authoritative principle: adoption of special tax depreciation	Abolishment of reverse authoritative principle: no adoption of special tax depreciation	Diverse, e.g. accelerated depreciation (promotion of SME); valuation discounts; increased depreciation (restored buildings)	no	possible	discretionary	discretionary	divergence
Pre-paid expenses								
Tariffs/Excise taxes/value added tax on customer advances	Capitalization optional	Capitalization prohibited	Capitalization required	possible	yes	deterministic	deterministic	divergence
Debt discount	Capitalization optional	Capitalization optional	Capitalization required	possible	possible	discretionary	deterministic	-

*Deviation: implied divergence or convergence of book and tax income? (- : no change/no clear tendency)

				Deviations				
				Deviation		**deterministic/ discretionary**		**divergence/ convergence**
Balance sheet item	**German GAAP pre-BilMoG**	**German GAAP post-BilMoG**	**Tax Balance Sheet**	pre-BilMoG	post-BilMoG	with regard to financial accounting	with regard to tax balance sheet	*
Equity								
Special item with reserve component	Recognition optional	Recognition prohibited	Recognition optional (reinvestment reserve, subsidy reserve, replacement reserve, gains from confusion)	no	possible	-	discretionary	divergence
Provisions								
Pension provisions								
Recognition								
Pension provisions (New provisions)	Recognition required (uncertain liability)	Recognition required (uncertain liability)	Recognition required if conditions fulfilled, otherwise recognition prohibited	possible	possible	deterministic	deterministic	no change
Pension provisions (Existing provisions)	Recognition optional	Recognition optional	Recognition optional (as German GAAP)	no	no	-	-	no change
Indirect commitments from pension promise	Recognition optional	Recognition optional	Recognition prohibited	possible	possible	discretionary	-	no change
Measurement								
General measurement	No requirement concerning measurement, modified discount value method	No requirement concerning measurement, possibly transition to projected unit credit method, no modified discount value method	Modified discount value method (proceedings for equal distribution)	possible	possible	deterministic	deterministic	divergence
Consideration of salary and pension trends	Depending on economic situation (following tax law)	Consideration required	Consideration prohibited	possible	yes	deterministic	deterministic	divergence
Discounting	Depending on economic situation 3-6% (following tax law)	Required, average market interest rate of previous 7 years, option for general fixing at 15 years	Required, 6%	possible	possible	deterministic	deterministic	divergence

Vacation provisions	Consideration of pay increases after balance sheet date, yearly agreed-upon fringe benefits such as bonuses, allocations to pension provisions, proportionate overhead costs; for determining of daily rate: actual working days usually 220 days per year	Consideration of pay increases after balance sheet date, yearly agreed-upon fringe benefits such as bonuses, allocations to pension provisions, proportionate overhead costs; for determining of daily rate: actual working days usually 220 days per year	No consideration of pay increases after balance sheet date, yearly agreed-upon fringe benefits such as bonuses, allocations to pension provisions, proportionate overhead costs; for determining of daily rate: regular working days (250 working days per year)	possible	possible	deterministic	deterministic	-
Other provisions								
Recognition								
Provisions for contingent losses	Recognition required	Recognition required	Recognition prohibited	yes	yes	deterministic	deterministic	no change
Provisions for deferred maintenance (catching up within three months)	Recognition required	Recognition required	Recognition required, only for liabilities against third parties	possible	possible	deterministic	deterministic	no change
Provisions for deferred maintenance(catching up after three months but within the following financial year)	Recognition optional	Recognition prohibited	Recognition prohibited	possible	no	-	-	convergence
Provisions for infringement of patents, authority or similar property rights	If sufficiently concretized recognition required, otherwise prohibited	If sufficiently concretized recognition required, otherwise prohibited	Under certain conditions recognition required, otherwise prohibited	possible	possible	deterministic	deterministic	no change
Provisions for anniversary bonuses	Recognition required	Recognition required	Only under certain conditions recognition required, otherwise prohibited	possible	possible	deterministic	deterministic	no change
Provisions for costs to be capitalized in future periods	Recognition required	Recognition required	Recognition prohibited	yes	yes	deterministic	deterministic	no change
Provisions for harmless disposal of radioactive waste material	Recognition required	Recognition required	Recognition prohibited	yes	yes	deterministic	deterministic	no change
Provisions that only need to be fulfilled when future earnings or gains accrue	Recognition required	Recognition required	Recognition prohibited, only when earnings or gains accrue	yes	yes	deterministic	deterministic	no change

Measurement								
General measurement	Settlement amount according to rational commercial judgement	Settlement amount according to rational commercial judgement	Settlement amount	possible	possible	deterministic (possibly powers of discretion: discretionary)	deterministic (possibly powers of discretion: discretionary)	no change
Future price and cost increases	Consideration prohibited	Consideration required	Consideration prohibited	no	yes	deterministic	deterministic	divergence
Discounting (maturity > 1 year)	Prohibited	Required, average market interest rate of previous 7 years	Required, 5.5%	yes	possible	deterministic	deterministic	no clear tendency/convergence
Liabilities								
Recognition								
Liabilities that need only be fulfilled when future earnings or gains accrue	Recognition required (rational commercial judgement)	Recognition required (rational commercial judgement)	Recognition prohibited, only when earnings or gains accrue	yes	yes	deterministic	deterministic	no change
Measurement								
General measurement	Value at time of accrual or higher repayment amount respectively	Settlement amount	(Discounted) settlement amount	possible	possible	deterministic	deterministic	no change
Discounting (maturity > 1 year)	No present value estimate	No present value estimate	Required, 5.5%	yes	yes	deterministic	deterministic	no change
Reflection of uncertainty	Rational commercial discretion	Rational commercial discretion	Going-concern value; consideration of probability that only part of the liability needs to be fulfilled	possible	possible	deterministic	deterministic	no change

* Deviation: implied divergence or convergence of book and tax income? (- : no change/no clear tendency)Note: This table lists (possible) deviations between financial and tax accounting at the level of single balance sheet items, pre- and post-reform.

Table A- 4: Descriptive Statistics

Variable	Pooled (2008-2012)	Pre-BilMoG (2008-2009)	Post-BilMoG (2010-2012)
BTD	-0.001	-0.006	0.003
	(0.082)	(0.071)	(0.092)
Profitability	0.847	0.844	0.849
	(0.360)	(0.363)	(0.358)
PPE	0.142	0.147	0.137
	(0.199)	(0.201)	(0.197)
Inventories	0.113	0.109	0.118
	(0.169)	(0.162)	(0.176)
Financials	0.224	0.225	0.223
	(0.322)	(0.322)	(0.321)
Provisions	0.167	0.170	0.165
	(0.190)	(0.191)	(0.189)
Leverage	20.005	16.327	23.656
	(115.731)	(85.228)	(139.645)
Reorganization	0.188	0.214	0.163
	(0.391)	(0.411)	(0.370)
Size	17.410	17.400	17.419
	(1.967)	(1.942)	(1.994)
Liquidity	126.377	226.554	27.933
	(2592.468)	(3678.415)	(181.622)

Note: This table displays the mean of the variables used in the regression analysis for the full sample (1) or a sample split for the years 2008-2009 pre-reform (2) and the years 2010-1012 post-reform (3) respectively. Standard errors are shown in parentheses.

Table A- 5: Correlation Matrix

	BTD	Profitability	PPE	Inventories	Financials	Provisions	Leverage	Reorgani-zation	Size	Liquidity
BTD	1.0000									
Profitability	0.1005*	1.0000								
PPE	-0.0246	0.0391	1.0000							
Inventories	0.0503	0.1169*	0.0331	1.0000						
Financials	-0.0460	-0.1274*	-0.3397*	-0.3139*	1.0000					
Provisions	-0.0327	0.1010*	0.0247	0.0214	-0.3800*	1.0000				
Leverage	-0.0070	0.0066	-0.0501	-0.0017	-0.0912	0.0541	1.0000			
Reorganization	-0.0868	-0.0832	-0.1063	-0.0439	-0.0430	0.0698	-0.0602	1.0000		
Size	-0.0998*	0.0379	0.1700*	-0.1240*	0.2832*	0.0185	-0.0305	0.0780	1.0000	
Liquidity	-0.0077	-0.0883	-0.0261	-0.0299	-0.0299	-0.0343	-0.0078	-0.0191	-0.0636	1.0000

Note: This table displays the correlation between the variables used in the regression analysis. * represents a 1% significance level

Kurzlebenslauf

Ina Meier

Akademischer Werdegang:

07/2016 – 09/2016	Forschungsaufenthalt, The University of Chicago Law School, USA
09/2012 – 01/2017	Wissenschaftliche Mitarbeiterin, Lehrstuhl für ABWL und Betriebswirtschaftliche Steuerlehre II, Prof. Dr. Christoph Spengel
09/2010 – 07/2012	Master-Studium der Betriebswirtschaftslehre, Universität Mannheim
07/2009 – 12/2009	Auslandssemester, Queensland University of Technology, Brisbane, Australien
09/2007 – 06/2010	Bachelor Studium der Betriebswirtschaftslehre, Universität Mannheim
06/2007	Abitur, Gymnasium Wendalinum, St.Wendel