Did the Adoption of IAS/IFRS by German Firms in 2005 Improve Earnings' Predictive Power with regard to Forecasting Future Operating Cash Flows?

An Empirical Analysis of German Publicly Listed Firms.

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Abstract—This study examines whether the adoption of International Accounting Standards and International Financial Reporting Standards by German firms in 2005 improved earnings' predictive power with regard to forecasting future operating cash flow. We consider earnings' predictive power as one dimension of accounting quality. We use a data sample of German DAX and MDAX firms ranging from 2001 to 2011. The sample is split into two distinct subsamples (time period before and after 2005, the year of the adoption of International Accounting Standards) to test whether earnings' predictive power has changed. We employ a disaggregated cash flow forecasting model in which earnings are split into the components cash flow and accruals. Accruals are further decomposed into individual accrual measures. We predict that the adoption of International Accounting Standards affected accruals differently and that the model's overall predictive power improves after the adoption. Our results do not support the IASB's claim that International Accounting Standards are superior to German-GAAP and have a significantly positive impact on earnings' predictive power.

Key words: cash flow forecasting model, accruals, predictive power of earnings, IAS, IFRS

I. INTRODUCTION

This study examines whether the adoption of International Accounting Standards and International Financial Reporting Standards (henceforth: IAS/IFRS) by German firms in 2005 improved earnings' predictive power¹ with regard to forecasting future operating cash flow. We consider earnings' predictive power as one dimension of accounting quality. The International Accounting Standards Board (henceforth: IASB) and other proponents of IAS/IFRS (e.g. national legislative bodies that transferred IAS/IFRS into national law) claimed prior to 2005 that the adoption of IAS/IFRS in Germany would lead to more transparent and reliable financial statements as

German Generally-Accepted Accounting Principles (henceforth: German-GAAP) gives too much leeway to the management in managing earnings with accruals, thereby rendering the predictive power of earnings to be low. In contrast to German-GAAP, IAS/IFRS place more weight on the accounting principle of fair presentation, also referred to as true and fair view, than on the principle of prudence. According to the IFRS Framework for the Preparation and Presentation of Financial Statements, fair presentation means "(...) to provide information about the financial position, performance, and changes in financial position of an entity; this information should be useful to a wide range of users for the purpose of making economic decisions." [1, par. 12].² The prudence principle implies that in financial statements all foreseeable risks and losses are taken into account and is thus more concerned with the preservation of capital and the protection of creditors³. Reference [3] summarizes the IAS/IFRS proponents' expectations as follows: "Regulators expect that the use of IFRS enhances the comparability of financial statements, improves corporate transparency, increases the quality of financial reporting, and hence benefits investors..." (p. 1086).

The implications of the IAS/IFRS proponents' arguments for the research question of this study are as follows: if IAS/IFRS really made financial reports more transparent and reliable they would also make accruals-related management assumptions and estimates more transparent and reliable as

² The fair presentation principle is also described in International Accounting Standard No. 1: Presentation of Financial Statements: "Fair presentation requires faithful representation of the effects of transactions, events and conditions in accordance with the definitions and recognition criteria for assets, liabilities, income and expenses set out in the Framework" ([2], par. 13, emphasis not added)).

³ The prudence principle is codified in the German Code of Commercial Law, *Handelsgesetzbuch*, art. 252, par. 1, no. 4.

¹ In this study the terms 'predictive power' and 'explanatory power' are used interchangeably.

more pressure is exerted on the management to make those assumptions and estimates accurately. Putting it differently, managers who misuse accruals to influence, i.e. manage earnings faced a higher probability of being detected. As a result, the accruals component of earnings became more reliable, thereby improving earnings' predictive power for cash flow forecasting.

However, there are reasons to be skeptical about the positive impact of IAS/IFRS as many studies have investigated this issue and come to mixed results. As [3] point out with regard to high expectations about the improvement of financial statements' quality: "From an economic perspective, there are reasons to be skeptical about these expectations and, in particular, the premise that simply mandating IFRS makes corporate reporting more informative or more comparable. Thus, the economic consequences of mandating IFRS reporting are not obvious." (p. 1086).

The relationship between future operating cash flow and current earnings is of great importance to practitioners, such as standard setters, legislators, auditors, appraisers, rating agencies and especially banks. In Germany, the majority of firms obtain their debt financing from banks and not the debt capital market. As a result, banks heavily rely on cash flow forecasting models to evaluate prospective clients' capability of making interest and principal payments in future periods. If the adoption of IAS/IFRS had an impact on earnings' predictive power it is critical for banks to understand its direction and significance.

This paper makes a contribution to the literature as it combines two streams of literature. One stream represents the vast area of studies investigating the impact of the adoption of IAS/IFRS on different variables (for details see the literature overview in the next section). Unfortunately, these studies do not consider the predictive power of earnings or any change in earnings' predictive power resulting from the IAS/IFRS adoption. The other stream deals with different types of cash flow forecasting models. However, insights from these studies are not linked to IAS/IFRS-related research questions. Therefore, in this study we make a contribution by using the insights from studies dealing with cash flow forecasting models and applying such a model to the question as to whether earnings' predictive power has changed due to the adoption of IAS/IFRS.

The paper is organized as follows: in Section 2 we present a literature overview of studies dealing with cash flow forecasting models, identify a research gap in this area of research and develop a research question and hypotheses based on the gap identified. In Section 3 we outline the method employed in this paper (research design and data) to address the research question. In Section 4 we describe the results found. Section 5 concludes.

II. RESEARCH GAP IN LITERATURE, DEVELOPMENT OF RESEARCH QUESTION, AND HYPOTHESES DEVELOPMENT

A. *Overview of literature related to cash flow forecasting models and identification of research gap*

To forecast future cash flows, a financial analyst could use current and/or past cash flows to identify a trend. According to [4] this approach is quite popular amongst practitioners as cash flows are a reliable measure that is hardly biased, i.e. the impact of management assumptions and estimates is minimal. However, the use of current and/or past cash flows as a proxy for future cash flows is contrary to common insights provided by accounting theory. According to accounting theory the usefulness of cash flows is limited as cash flows are not time-period specific, i.e. they are not spread across relevant time periods (refer to [4], and [5]). This makes cash flows volatile and less relevant for valuation purposes. For example, if a company invests in a tangible asset with a useful lifetime of ten years, the cash outflow only occurs at the beginning of the investment period ($t=0$). The utilization of the asset over the useful lifetime (from $t=1$ to $t=10$) is not considered.

Instead of using current and/or past cash flows the financial analyst could alternatively utilize earnings to forecast future cash flows. Earnings consist of two components: (1) 'cash flow' and (2) elements that are used to smooth cash flows across time periods, in the following referred to as 'accruals'. Reference [5] defines accruals as follows: "Accrual is the accounting process of recognizing noncash events and circumstances as they occur, specifically, accrual entails recognizing revenues and related increases in assets and expenses and related increases in liabilities for amounts expected to be received or paid, usually in cash, in the future..." (p. 179). As earnings contain not only cash flows but also accruals and thus information about the cash flows' utilization across time periods, they are generally considered in accounting theory to be highly relevant for valuation purposes. For the same reason, though, their reliability is limited. This is because accruals are based on management assumptions and estimates. If management is unwilling or unable to determine accruals accurately their usefulness is negligible. As [4] point out, there is a "trade-off between relevance and reliability" (p. 8) when it comes to the question as to whether current and/or past cash flows or earnings should be used to forecast future cash flows. Earnings are only more useful than cash flows if earnings' quality is high, i.e. if the accruals component accurately smoothes cash flows over time.

Regulators such as the Financial Accounting Standards Board (henceforth: FASB) in the United States follow the prevalent opinion in accounting theory that earnings have significant and even more explanatory power than cash flows alone. FASB states that "[Investors'] interest in an enterprise's future cash flows and its ability to generate favorable cash flows leads primarily to an interest in information about its earnings rather than information directly about its cash flows." [6, par. 43]. Academic research findings stress the usefulness of earnings as well. Reference [7] investigates "the relative ability of earnings and operating cash flow to predict future operating cash flows" (p. 3) and come to the conclusion that "earnings are consistently incrementally useful in forecasting

future cash flows at all horizons". Cash flows on the other hand "exhibit only modest incremental forecasting power, and the sign of their forecasting relation is not always positive or significant" (p. 20).

Given that future cash flows should be forecast using earnings the question arises as to whether aggregate or disaggregated earnings should be used. Many studies have investigated this question. Here, we will discuss three of them: [8], [9], and [10]. The discussion is important to derive the specific model used for the purposes of this paper. All three studies come to the conclusion that disaggregate earnings (earnings that are disaggregated into the components 'cash flow' and 'accruals') have a comparable advantage over aggregate earnings in explaining future cash flows. Moreover, further disaggregation of the accruals component of earnings yields even higher explanatory power of earnings.

Reference [8] provides a deep analysis of the issue, using data of firms in the United States as provided by Compustat for the time period 1987-1996. The authors find that the "disaggregated earnings specification has substantially more predictive ability" (p. 41) as measured by adjusted R squared than the first model.

Reference [9] replicates the analysis presented in [8] using United Kingdom data and comes to the same conclusion as [8] and find that "the disaggregation of earnings into cash flows and accruals, generates superior explanatory power with regard to future cash flows" (p. 861). The authors use the same models, that is, they compare models with aggregate earnings, disaggregate earnings but aggregate accruals, and disaggregate earnings including disaggregate accruals, respectively. As expected, [9] find that the coefficients of the independent variables used (accounts receivable, inventory etc.) are statistically significant and show the expected sign. After regressing operating cash flow against the above-mentioned independent variables, the authors compare the models' predictive power. Similar to the results in [8] adjusted R squared and thus explanatory power increases as the models become more disaggregated. These results are particularly robust for one-year-ahead forecasts.

Reference [10] discusses the usefulness of different cash flow forecasting models as well. However, unlike the other two studies that only used data of listed companies in the United States and United Kingdom, respectively, these authors use data of German Small and Medium-sized Enterprises of which only a small fraction is publicly listed. The authors find, in accordance with the other studies that a disaggregated model is best to forecast future cash flows.

B. Development of research question

In the literature dealing with the adoption of IAS/IFRS the impact of this accounting regime change on earnings' predictive power and the usefulness of cash flow forecasting models has not been addressed. Studies dealing with the (mandatory and/or voluntary) adoption of IAS/IFRS focus on various economic factors other than predictive power of

earnings.⁴ Specifically, none of these studies investigates whether mandatory IAS/IFRS adoption led to an improvement of earnings' predictive power with regard to forecasting future operating cash flows. Moreover, studies dealing with cash flow forecasting models (most notably [8], [9], and [10]) do not focus on the usefulness of the IAS/IFRS adoption either. These studies investigate what type of cash flow forecasting model yields the most reliable results but do not link their findings to question whether the adoption of IAS/IFRS improved these models.⁵ This study fills the gap in the literature in using insights from research dealing with different types of forecasting modes and applying these in an IAS/IFRS setting. More specifically, as current research thus far reveals that disaggregated earnings are more useful in predicting future operating cash flow, we apply a disaggregated cash flow forecasting model to test whether earnings' predictive power has changed after the adoption of IAS/IFRS.

C. Hypotheses development

Considering the fact that IAS/IFRS standards affect accruals differently we expect that the accruals used in the model (see below) differ with regard to their predictive power. Specifically, we do not expect significant changes in predictive power of accounts payable (there is no IAS/IFRS standard dealing explicitly with the accounting of accounts payable), expect minor changes in the predictive power of accounts receivable, inventory and depreciation (standards dealing with revenue recognition [IAS 18 Revenue], inventory valuation [IAS 2 Inventories] and the valuation of tangible assets [IAS 16 Property, Plant and Equipment] differ somewhat but not significantly from German-GAAP) and significant changes with regard to provisions and amortization. Here, IAS/IFRS rules differ significantly from German-GAAP (refer specifically to IFRS 3 Business Combinations and IAS 37 Provisions, Contingent Liabilities and Contingent Assets).

These considerations lead to the following hypotheses:

H1: Predictive power of the accrual measure 'accounts payable' does not change after the adoption of IAS/IFRS in Germany.

H2: Predictive power of the accrual measures 'accounts receivable', 'inventory' and 'depreciation' improves to some extent after the adoption of IAS/IFRS in Germany.

⁴ For example, there are studies focusing on earnings management ([11], [12], and [13]), the timeliness of loss recognition ([11] and [13]), the value relevance of accounting amounts [13]), market liquidity, Tobin's q, the cost of capital in general ([3]), income smoothing and the aggressiveness of accruals reporting ([11]) and the level of disclosure and the information asymmetry component of cost of capital ([14]).

⁵ The studies main findings are that the earnings measure is a good predictor of future operating cash flow and that disaggregated earnings (decomposed into the components cash flow and accruals) yield even higher predictive power than aggregated earnings. (Other studies on this topic include [7] and [15].)

H3: Predictive power of the accrual measures ‘amortization’ and ‘provisions’ improves significantly after the adoption of IAS/IFRS in Germany.

Moreover, to see whether IAS/IFRS had an overall effect on earnings’ predictive power we look at the R squared of each subsample. Given the IAS/IFRS proponents’ assertion that international standards are superior to German-GAAP we would expect an increase in R squared following the adoption of IAS/IFRS. This can be stated as a hypothesis (in alternative form) as follows:

H4: R squared in the time period before the adoption of IAS/IFRS is lower than R squared in the time period after the adoption.

III. METHOD

A. Research design

Given the preceding discussion, in this study we use a cash flow forecasting model with disaggregated earnings (earnings broken down into the components cash flow and accruals) as earnings better explain future cash flow than current cash flow. For the same reason, we further disaggregate the accruals component. In particular, the following accruals variables are used: depreciation, amortization, provisions, accounts receivable, inventory, and accounts payable. To operationalize these variables, depreciation and amortization is measured using the stated amounts from the cash flow statement. Provisions are proxied using provisions for risk and charges as stated in the balance sheet. Accounts receivable and accounts payable reflect net amounts as stated in the balance sheet. Inventory reflect total inventory as stated in the balance sheet. All variables are normalized to reflect the fact that firms used in the sample differ with regard to size. Therefore, cash flow was normalized using revenues. All other variables are normalized using total assets.

Conceptually, cash flow in period $t+1$ is regressed against the components of earnings, cash flow and accruals, in period t and accruals are further decomposed into various components. Here, the dependent variable, cash flow, is operationalized using operating cash flow as stated in the cash flow statement and the components of accruals used are accounts receivable, inventory, accounts payable, provisions, depreciation and amortization. Balance sheet accruals are operationalized using the one-period change of the respective accrual.

The model has the following form:

$$OCF_{i,t+1} = b_0 + b_1 OCF_{i,t} + b_2 DEPR_{i,t} + b_3 AMORT_{i,t} + b_4 \Delta PROV_{i,t} + b_5 \Delta ACCREC_{i,t} + b_6 \Delta INV_{i,t} + b_7 \Delta ACCPAY_{i,t} + e_{i,t}$$

where i and t denote firms and years, respectively; OCF denotes net operating cash flow as stated in the cash flow statement; $DEPR$ and $AMORT$ denote depreciation expense of tangible assets and amortization expense of intangible assets, respectively, as stated in the cash flow statement; $\Delta PROV$ denotes the one-period change in provisions for risks and charges as stated in the balance sheet; $\Delta ACCREC$, ΔINV , and $\Delta ACCPAY$ denote the one-period change in

accounts receivable, inventory, and accounts payable, respectively, as stated in the balance sheet.

B. Data

The overall panel data sample covers the time period from 2000 through 2011 and contains annual financial information of 67 firms. The sample is split into two distinct subsamples to test any change in earnings’ predictive power after the adoption of IAS/IFRS. The first subsample covers the years 2001 through 2004 (period before IAS/IFRS adoption) and the second subsample covers the period 2006 through 2011 (period after IAS/IFRS adoption). The year of adoption, 2005, was excluded to reflect the fact that firms needed some time to fully adopt the new standards. For comparison purposes, the both subsamples were also tested together.

Financial data were taken from ThomsonOne. Firms in the data sample comprise the German DAX (XETRDX; 30 firms) and MDAX (XMDAXIN; 50 firms) segment. Firms with main operations in the financial services sector were excluded based on the primary SIC code (primary SIC codes 6021 to 6799). As a result, 5 DAX and 8 MDAX firms were excluded, yielding a total set of 67 firms used for the analysis. For subsample one (two), comprising of four (six) years and 67 firms, 268 (402) observations were obtained. Due to data gaps 76 (48) observations had to be eliminated yielding 192 (354) observations that were used in the analysis (1,671 and 2,762 unique firm-year observations, respectively). For the entire data set, comprising of eleven years and 67 firms, 737 observations were obtained. Due to data gaps 136 observations had to be eliminated yielding 601 observations that were used in the analysis (4,875 unique firm-year observations). Table 1 shows descriptive statistics on the variables used.

< Insert Table 1 here >

IV. RESEARCH RESULTS

The results of the analysis are shown in Table 2. As predicted, accounts receivable are not strongly associated with one-year ahead operating cash flow. In contrast to our prediction, coefficients of the variables amortization expense and provisions are not statistically significant either. Accounts receivable and depreciation expense show significance in the first subsample (time period before adoption) but not in the second subsample (time period after adoption). Inventory is only significantly associated with the dependent variable in the overall data set.

With regard to the overall impact of IAS/IFRS on the predictive power of the forecasting model employed we can see that R squared improved after the adoption of IAS/IFRS (increase from 26.27% to 34.27%). In the overall sample, R squared amounts to 69.23%. However, this result may not be overly robust given that the F-test yields insignificant results.

< Insert Table 2 here >

V. CONCLUSION, IMPLICATIONS AND LIMITATIONS

In this study we outline how a disaggregated cash flow forecasting model can be applied to test whether earnings’

predictive power with regard to forecasting operating cash flow has changed for German firms as a result of the IAS/IFRS adoption. Such an analysis is of great importance as banks and other practitioners (e.g. rating agencies) heavily rely on cash flow forecasting models in Germany. The IASB (and other IAS/IFRS proponents) claimed prior to 2005 (the year of adoption) that IAS/IFRS are superior to German-GAAP as they place a higher weight to the true and fair view principle. In contrast, German-GAAP emphasizes the prudence principle. Due to the shift from the prudence to the true and fair view principle firms are now less able to manage earnings using accruals. As a result, overall accounting quality (and earnings' predictive power) improves.

Many studies have investigated whether the adoption of IAS/IFRS has been a success or not by looking at variables other than earnings' predictive power. Thus far, the results clearly indicate that IAS/IFRS have not improved accounting quality significantly as asserted by the IASB.

In this study we measure whether earnings' predictive power improves after the adoption of IAS/IFRS. Our results indicate that this is only the case to a limited extent. R squared of the second subsample is slightly higher than the R squared of the first subsample. However, the F-test indicates that this result must be interpreted with caution. Thus, we do not find that the adoption of IAS/IFRS had an obvious and significantly positive impact on earnings' predictive power.

However, this study has limitations. First, the data sample is rather small. This is due to the fact that ThomsonOne only provides data on accruals for large corporations. Therefore, we were limited to using German DAX and MDAX firms. Accruals data for firms in the small-stock segment are not available without significant data gaps. Second, only the most common accruals were considered in the model. In future studies it might be advisable to also include accrued expenses, deferred revenue etc. however, for the reasons stated above, these items may not be available from a common database but have to be hand-collected using the notes of the financial statements. Third, some accruals, e.g. depreciation and amortization expense, may not be free of overlap. It is possible that for a specific firm the data item 'depreciation expense' also contains amortization of intangible assets even though a separate data item with the label 'amortization expense' is available from the data base. The definitions provided by ThomsonOne do not allow excluding overlap entirely. Fourth, as we measure the effect of the adoption of IAS/IFRS in this study we make the assumption—as many other studies in this field—that accounting standards did not change over time. Obviously, this is not the case for every accounting standard considered. Finally, we avoid making the data sample even smaller as it already is we did not exclude firms that adopted IAS/IFRS voluntarily prior to 2005. Therefore, for some firms self-selection bias may be present.

To remedy the limited amount of data points it may be advisable in future analyses to consider extending the data set by using not only German but all IAS/IFRS firms. This would include large firms from across Europe and also non-European and non-U.S. firms following IAS/IFRS.

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APPENDIX

TABLE I. DESCRIPTIVE STATISTICS ON EXPLANATORY VARIABLES

PANEL A: OVERALL SAMPLE (2001—2011)						
Variable		Mean	Std. Dev.	Min	Max	Obs.
OCF_t	Overall	9.91%	9.07%	-35.18%	65.70%	709
	Between		8.42%	-11.87%	56.01%	67
	Within		3.74%	-13.40%	28.01%	11
DEPR_t	Overall	5.09%	4.74%	0.81%	62.19%	697
	Between		3.10%	1.78%	18.00%	67
	Within		3.72%	-11.16%	49.27%	10
AMORT_t	Overall	1.12%	1.98%	0.04%	38.67%	629
	Between		1.45%	0.17%	9.51%	67
	Within		1.45%	-5.11%	30.28%	9
Delta_PROV_t	Overall	-0.08%	4.66%	-21.13%	63.34%	705
	Between		1.20%	-2.20%	5.60%	67
	Within		4.53%	-21.32%	58.59%	11
Delta_AR_t	Overall	0.79%	3.76%	-27.43%	21.85%	714
	Between		1.29%	-3.46%	3.94%	67
	Within		3.54%	-24.65%	20.17%	11
Delta_INV_t	Overall	0.89%	3.42%	-15.84%	32.56%	714
	Between		1.17%	-1.28%	4.80%	67
	Within		3.22%	-16.16%	30.27%	11
Delta_AP_t	Overall	0.81%	2.55%	-11.42%	19.31%	707
	Between		0.94%	-0.72%	3.84%	67
	Within		2.39%	-10.09%	17.07%	11
PANEL B: SUBSAMPLE ONE (2001—2004)						
Variable		Mean	Std. Dev.	Min	Max	Obs.
OCF_t	Overall	9.48%	8.68%	-5.54%	65.70%	244
	Between		8.21%	-3.59%	59.37%	64
	Within		2.72%	0.18%	23.80%	4
DEPR_t	Overall	6.40%	6.98%	0.82%	62.19%	242
	Between		5.96%	1.07%	44.61%	63
	Within		3.77%	-36.46%	23.97%	4
AMORT_t	Overall	1.21%	1.23%	0.04%	9.84%	202
	Between		1.09%	0.09%	6.37%	62
	Within		0.73%	-2.25%	4.68%	3
Delta_PROV_t	Overall	-0.02%	7.12%	-21.13%	63.34%	244
	Between		5.48%	-5.08%	38.34%	64
	Within		6.20%	-29.03%	50.89%	4
Delta_AR_t	Overall	0.89%	4.09%	-11.95%	21.85%	247
	Between		2.58%	-3.03%	12.53%	64
	Within		3.36%	-13.45%	18.75%	4
Delta_INV_t	Overall	0.74%	3.98%	-8.22%	32.56%	248
	Between		2.35%	-2.55%	12.68%	64
	Within		3.38%	-12.20%	27.48%	4
Delta_AP_t	Overall	0.60%	2.62%	-4.75%	19.31%	244
	Between		1.68%	-1.73%	7.82%	64
	Within		2.15%	-7.77%	12.79%	4

TABLE I. DESCRIPTIVE STATISTICS ON EXPLANATORY VARIABLES (CONT.)

PANEL C: SUBSAMPLE TWO (2006—2011)

Variable		Mean	Std. Dev.	Min	Max	Obs.
OCF_t	Overall	10.25%	9.32%	-35.18%	60.44%	401
	Between		8.51%	-15.36%	53.33%	67
	Within		3.92%	-9.56%	27.81%	6
DEPR_t	Overall	4.37%	2.75%	0.81%	24.33%	392
	Between		2.42%	1.60%	17.27%	67
	Within		1.30%	-0.81%	14.42%	6
AMORT_t	Overall	1.14%	2.40%	0.05%	38.67%	369
	Between		1.71%	0.11%	12.11%	67
	Within		1.62%	-6.68%	27.70%	6
Delta_PROV_t	Overall	0.04%	2.13%	-19.76%	17.53%	398
	Between		0.75%	-2.97%	2.62%	67
	Within		1.99%	-16.75%	14.95%	6
Delta_AR_t	Overall	0.68%	3.50%	-27.43%	18.43%	402
	Between		1.34%	-5.04%	3.94%	67
	Within		3.23%	-22.05%	15.16%	6
Delta_INV_t	Overall	0.91%	3.09%	-15.84%	20.05%	401
	Between		1.33%	-1.81%	8.18%	67
	Within		2.80%	-18.12%	12.78%	6
Delta_AP_t	Overall	0.85%	2.55%	-11.42%	14.53%	399
	Between		0.98%	-0.86%	4.27%	67
	Within		2.36%	-9.70%	11.54%	6

NOTES:

This table presents descriptive statistics for the overall data sample (Panel A) and the two subsamples (Panel B and C). Panel A comprises 11 years (2001 – 2011) and 67 firms (4875 unique firm-year observations). Panel B comprises 4 years (2001 – 2004) and 67 firms (1671 unique firm-year observations). Panel C comprises 6 years (2006 – 2011) and 67 firms (2762 unique firm-year observations). The year of adoption, 2005, was omitted from the analysis due to the fact that firms needed some time to adapt to the changing regulatory environment. Dependent variable is the one-year ahead operating cash flow (ThomsonOne acronym: TF.FN.NetCashFlowOperatingCFStmt). Asterisks *, **, and *** denote statistical significance at the 10%, 5%, and 1% level of significance, respectively. OCF_t (ThomsonOne acronym: TF.FN.NetCashFlowOperatingCFStmt) is the operating cash flow in period t as stated in the cash flow statement. DEPR_t (ThomsonOne acronym: TF.RF.DepreciationCFStmt) is the depreciation expense in period t as stated in the cash flow statement. AMORT_t (ThomsonOne acronym: TF.FN.AmortizationOfIntangAssetsCFStmt) is the amortization expense in period t as stated in the cash flow statement. Delta_PROV_t (ThomsonOne acronym: TF.FN.ProvisionForRisksAndCharges) is the one-period change in provisions for risks and charges in period t as stated in the balance sheet. Delta_AR_t (ThomsonOne acronym: TF.RF.AccountsReceivableTradeNet) is the one-period change in accounts receivable in period t as stated in the balance sheet. Delta_INV_t (ThomsonOne acronym: TF.RF.TotalInventory) is the one-period change in accounts receivable in period t as stated in the balance sheet. Delta_AP_t (ThomsonOne acronym: TF.RF.AccountsPayable) is the one-period change in accounts receivable in period t as stated in the balance sheet. All variables were normalized to account for firm size of the firms used. Operating cash flow was normalized using revenue (ThomsonOne acronym: TF.RF.TotalRevenue). All other variables were normalized using total assets (ThomsonOne acronym: TF.RF.TotalAssets).

TABLE II. REGRESSION RESULTS OF FIXED EFFECTS (WITHIN) REGRESSION

$$\text{OCF}_{i,t+1} = b_0 + b_1 \text{OCF}_{i,t} + b_2 \text{DEPR}_{i,t} + b_3 \text{AMORT}_{i,t} + b_4 \text{DeltaPROV}_{i,t} + b_5 \text{DeltaACCREC}_{i,t} + b_6 \text{DeltaINV}_{i,t} + b_7 \text{DeltaACCPAY}_{i,t} + e_{i,t}$$

PANEL A: OVERALL SAMPLE (2001—2011)

Number of observations: 601; number of groups: 67; R-squared (overall): 0.6923; Prob > F: 0.000

Variable	Coefficient		Std. Error	t-statistic	P-value
Constant	0.079066	***	0.005482	14.4	0.000
OCF_t	0.221411	***	0.045470	4.9	0.000
DEPR_t	-0.051343		0.044075	-1.2	0.245
AMORT_t	-0.163485		0.113304	-1.4	0.150
Delta_PROV_t	-0.043032		0.046202	-0.9	0.352
Delta_AR_t	0.019936		0.058983	0.3	0.736
Delta_INV_t	0.184582	**	0.067854	2.7	0.007
Delta_AP_t	-0.048190		0.090196	-0.5	0.593

PANEL B: SUBSAMPLE ONE (2001—2004)

Number of observations: 192; number of groups: 60; R-squared (overall): 0.2627; Prob > F: 0.0509

Variable	Coefficient		Std. Error	t-statistic	P-value
Constant	0.105206	***	0.011948	8.8	0.000
OCF_t	-0.018851		0.099875	-0.2	0.851
DEPR_t	-0.141093	*	0.067381	-2.1	0.038
AMORT_t	-0.237013		0.372944	-0.6	0.526
Delta_PROV_t	-0.101521		0.056631	-1.8	0.075
Delta_AR_t	-0.231993	*	0.102226	-2.3	0.025
Delta_INV_t	0.019215		0.131689	0.2	0.884
Delta_AP_t	0.144973		0.193870	0.8	0.456

PANEL C: SUBSAMPLE TWO (2006—2011)

Number of observations: 354; number of groups: 67; R-squared (overall): 0.3427; Prob > F: 0.4093

Variable	Coefficient		Std. Error	t-statistic	P-value
Constant	0.099172	***	0.011223	8.8	0.000
OCF_t	0.085953		0.063624	1.4	0.178
DEPR_t	-0.145116		0.207444	-0.7	0.485
AMORT_t	-0.108477		0.133076	-0.8	0.416
Delta_PROV_t	0.111063		0.119543	0.9	0.354
Delta_AR_t	0.036283		0.097832	0.4	0.711
Delta_INV_t	0.163804		0.091696	1.8	0.075
Delta_AP_t	-0.093779		0.120387	-0.8	0.437

NOTES:

This table presents regression results of a fixed effects (within) regression for the overall data sample (Panel A) and the two subsamples (Panel B and C). Panel A comprises 11 years (2001 – 2011) and 67 firms (4875 unique firm-year observations). Panel B comprises 4 years (2001 – 2004) and 67 firms (1671 unique firm-year observations). Panel C comprises 6 years (2006 – 2011) and 67 firms (2762 unique firm-year observations). The year of adoption, 2005, was omitted from the analysis due to the fact that firms needed some time to adapt to the changing regulatory environment. Dependent variable is the one-year ahead operating cash flow (ThomsonOne acronym: TF.FN.NetCashFlowOperatingCFStmt). Asterisks *, **, and *** denote statistical significance at the 10%, 5%, and 1% level of significance, respectively. OCF_t (ThomsonOne acronym: TF.FN.NetCashFlowOperatingCFStmt) is the operating cash flow in period t as stated in the cash flow statement. DEPR_t (ThomsonOne acronym: TF.RF.DepreciationCFStmt) is the depreciation expense in period t as stated in the cash flow statement. AMORT_t (ThomsonOne

acronym: TF.FN.AmortizationOfIntangAssetsCFStmnt) is the amortization expense in period t as stated in the cash flow statement. Delta_PROV_ t (ThomsonOne acronym: TF.FN.ProvisionForRisksAndCharges) is the one-period change in provisions for risks and charges in period t as stated in the balance sheet. Delta_AR_ t (ThomsonOne acronym: TF.RF.AccountsReceivableTradeNet) is the one-period change in accounts receivable in period t as stated in the balance sheet. Delta_INV_ t (ThomsonOne acronym: TF.RF.TotalInventory) is the one-period change in accounts receivable in period t as stated in the balance sheet. Delta_AP_ t (ThomsonOne acronym: TF.RF.AccountsPayable) is the one-period change in accounts receivable in period t as stated in the balance sheet. All variables were normalized to account for firm size of the firms used. Operating cash flow was normalized using revenue (ThomsonOne acronym: TF.RF.TotalRevenue). All other variables were normalized using total assets (ThomsonOne acronym: TF.RF.TotalAssets). The model was also tested using a random effects model. The coefficients of the fixed and random effects model were compared using the Hausman test (see [16]). The untabulated result of this test yielded a rejection of the null hypothesis that the difference in the coefficients is not systematic. Hence, a fixed effects model was employed in this analysis.