INTERNAL CONTROLS AND FINANCIAL STATEMENT ANALYSIS

Thomas D. Dowdell, Jr., PhD
North Dakota State University
811 2nd Ave N
Fargo, ND 58102
701-231-5876
thomas.dowdell@ndsu.edu

Bonnie K. Klamm, PhD, CPA
North Dakota State University
811 2nd Ave N
Fargo, ND 58102
701-231-8813
bonnie.klamm@ndsu.edu

Margaret L. Andersen, PhD
North Dakota State University
811 2nd Ave N
Fargo, ND 58102
701-231-9765
margaret.andersen@ndsu.edu

Keywords: Internal controls; financial statement analysis; return on net operating assets

INTERNAL CONTROLS AND FINANCIAL STATEMENT ANALYSIS

ABSTRACT

This study provides evidence on the relationship between internal controls and firm profitability by investigating the association of internal controls over financial reporting (ICFR) with return on equity and other ratios commonly used in financial statement analysis. More importantly, the relationship between measures of core activities (operating return) and of financing/investing activities (non-operating returns) with ICFR is examined. Regression analysis, using a variety of return measures as the dependent variable and a dummy variable for the presence or absence of material weaknesses in ICFR as the independent variable of interest, is the primary methodology. In addition, the relationship between changes in the variables is also examined. The results provide evidence that good internal control is closely related to better operating returns and not as closely related to better non-operating returns. There is also evidence that changes in internal control are related to operating returns but not to non-operating returns. The results provide support for the position that good internal control helps companies improve their profitability. These results provide insights into the impact of ICFR on firm operations and are useful to those analyzing financial statements for investing or lending purposes. Finally, the results provide management with evidence of the relationship between ICFR and firm operations. The paper extends the current literature by investigating the impact of internal controls on ratios commonly used in financial statement analysis.

INTRODUCTION

Numerous studies find that companies with effective internal control over financial reporting (ICFR) are more profitable than companies with ineffective ICFR (e.g., Ge and McVay 2005; Klamm and Watson 2009; Klamm *et al.* 2012; Lai *et al.* 2017). However, these studies use return on equity, return on assets, or the ratio of operating cash flows to assets to measure profitability. Managers, investors, and lenders use financial statement analysis (FSA) to investigate profitability in more detail by decomposing return on equity into operating and non-operating components and thus separating the core operations of the firm from its financing aspects. This distinction is important in investigating the ICFR/profitability relationship because ICFR could differentially affect a firm's core operations and its financing activities. This paper provides additional evidence on the relationship between internal control and company profitability by investigating whether ICFR affects operating and non-operating profitability measures differently and whether ICFR effects are observable in ratios commonly used in FSA.

Understanding the relation between ICFR and profitability can aid in evaluating the benefits and costs of internal control in general and Section 404 reports of the Sarbanes-Oxley act of 2002 (SOX 404) more specifically. The costs of SOX 404 have been well-documented. Leech and Leech (2011 p.295) assert that "Section 404 has almost certainly proven to be the most costly regulatory intervention in the history of securities regulation, costing billions of dollars each year." Other research (e.g., Montana, 2007) reports benefits of SOX, including improved financial controls and reporting. Surveyed managers appear to think the costs exceed the benefits because they believe that SOX has improved internal controls but do not believe that these improvements have enhanced profitability (Alexander *et al.* 2013). Perhaps managers would be more convinced of the benefits of improved internal control if they were aware of its effects on ratios commonly used in FSA.

Do improved internal controls impact operating *and* non-operating profitability? Prior research suggests that they do, but previous research has not used FSA ratios to investigate these questions. Cheng *et al.* (2018) find that their operational efficiency measure is higher for firms with effective ICFR compared to firms with ineffective ICFR. Costello and Wittenberg-Moerman (2011), Dhaliwal *et al.* (2011), and Kim *et al.* (2011) find that disclosure of a material weakness in internal controls leads to an increase in a firm's cost of debt. This paper extends these papers and provides additional evidence on the benefits of internal control and SOX 404 reports by investigating whether these internal control effects are observable in ratios used in FSA.

Consistent with prior research, the results indicate that effective ICFR is positively associated with the return on equity (e.g., Feng, *et al.* (2015). Companies with effective ICFR have higher return on average equity (ROE) compared to companies with ineffective ICFR. When the return on equity ratio is separated into operating and non-operating components, there is a stronger positive association between effective ICFR and operating performance than with non-operating performance.

This paper also investigates whether changes in ICFR are related to changes in returns. Firms that improve their ICFR have higher increases in ROE and operating returns compared to firms

whose ICFR stayed effective. In contrast, the results indicate that increases in non-operating returns are not higher for firms with ICFR improvement. Firms with ICFR that has deteriorated experience larger decreases in ROE than firms whose ICFR stayed effective.

The results provide insights into the implications of ICFR in relation to firm operations and are useful to those analyzing financial statements for investing or lending purposes. In addition, the results provide management with evidence of the relationship between ICFR and firm operations. Regulators, considering the policy issues associated with the required disclosure of internal control weaknesses, may benefit from empirical evidence on the impact of ICFR on organizations' profitability and returns, as well.

The remainder of this paper is organized as follows. The next section provides background information. Section three provides the hypotheses. Section four reports the methods and results. Section five concludes.

BACKGROUND

Internal Control and Profitability

Firms face numerous risks that may adversely affect operations and in turn adversely affect return on net operating activities. To mitigate these risks, firms implement internal controls, which is defined as a process "designed to provide reasonable assurance regarding the achievement of objectives. . . ", whereby the objectives are "the effectiveness and efficiency of operations, the reliability of financial reporting, and compliance with applicable laws and regulation" (COSO 2013). The reliability of financial reporting is the focus of the Sarbanes Oxley Act of 2002 (SOX). Section 404 focuses specifically on internal controls requiring management to attest to and report on the effectiveness of internal controls. Moreover, if ineffective, management must disclose internal control weaknesses.

The only public information on a firm's internal control is on internal controls over financial reporting (ICFR). Management's reports on ICFR improve reporting quality (Dowdell et al 2014), but whether ICFR affect operations is up for debate. On the one hand, some corporate managers

believe that SOX and the reporting of material internal control weaknesses have improved internal control, but they do not believe that these improvements have enhanced profitability (Alexander et al 2013). On the other hand, Ge and McVay (2005) and Feng *et al.* (2015) find that companies with effective ICFR are more profitable than companies with ineffective ICFR, and Feng *et al.* (2015) find that companies that improve their ICFR increase their profitability. Stoel and Muhanna (2011) and Kuhn *et al.* (2013) find that companies with information technology (IT) internal control weaknesses are more profitable compared to companies that do not have IT control weaknesses. The results presented in this paper are concerned with the relation between ICFR and overall profitability rather than ICFR and operations or IT specifically.

Feng *et al.* (2015) investigate the relation between ICFR and operations by concentrating on a specific type of internal control weakness. They find that firms with inventory-related weaknesses have lower inventory turnover and higher inventory impairments than firms with effective controls. Additionally, they find that companies that remediate their inventory-related weaknesses significantly improve their inventory turnover, sales, gross margin, and operating cash flows. Their results provide evidence that better inventory internal control improves operations.

Cheng *et al.* (2018) examine the relation between internal controls and operational efficiency which was measured using Data Envelopment Analysis (DEA). DEA is based on the relation between inputs and outputs (Cheng *et al.*, 2018, p. 1104 footnote 8). They find that operational efficiency is significantly higher for firms with effective ICFR compared to firms with ineffective ICFR. They also find that companies that improve their ICFR increase their operational efficiency. DEA methodology has been used extensively in academic research, both in operations and management accounting research to evaluate organizations' efficiency (Callen, 1991), but DEA has not been widely used in practice by management, investors, and lenders. This paper extends Cheng *et al.* (2018) by investigating the relation between internal controls and operating returns through the lens of FSA done by management, investors, and lenders.

Operational efficiency and profitability focus on firm operations, but internal controls, or the lack

thereof, may affect a portion of the non-operating returns, i.e., the returns related to financing and investing (non-operational assets) decisions. On the one hand, it could be expected that a well-managed firm with effective controls would face a lower cost of debt and would more likely show a positive financing return. On the other hand, poorly managed firms with ineffective controls will be riskier and thus face a higher cost of debt. Consequently, their financing return is more likely to be lower or even negative.

There is evidence that disclosure of a material weakness in internal controls leads to an increase in a firm's cost of debt (Kim *et al.* 2011; Costello and Wittenberg-Moerman 2011, Dhaliwal *et al.* 2011). One possible explanation is that weak internal controls may increase the probability of misappropriation of cash flows by management, which may increase default risk or weak internal controls may result in less reliable information increasing estimation risk for debt investors (Dhaliwal et al 2011). Each instance could result in an increase in the cost of debt.

Thus, the evaluation of a firm for investing or financing purposes requires the analysis of the firm's operations, i.e., its ability to generate profit on core operations. In addition, the evaluation requires an analysis of the firm's credit risk, its ability to borrow funds at a reasonable rate, and the ability to make its interest and debt payments. The decomposition of return on equity into operating and non-operating components facilitates this analysis.

Financial Statement Analysis

Financial statement analysis and valuation includes an analysis of the business environment, a review and analysis of financial statements, and the ability to predict future cash inflows to determine firm value, and thus serve as the basis of investing in a company or lending funds to a company. The Financial Accounting Standards Board states, "To assess an entity's prospects for future net cash inflows, existing and potential investors, lenders, and other creditors need information about the resources of the entity, claims against the entity, and how efficiently and effectively the entity's management and governing board have discharged their responsibilities to use the entity's resources" (FASB 2018, para. OB4). The use of such information includes, in part, profitability ratio analysis, and management's ability to maintain effective internal controls.

Return on net operating assets (RNOA)

A common overall performance measure, return on equity (ROE), can be decomposed into two returns: return on operating activities and return on non-operating (financing) activities. The operating return is operating income (after tax) expressed as a percentage of the net operating assets and liabilities computed from the balance sheet. This is the RNOA measure used in this study. The non-operating return is the expense (income) expressed as a percentage of the net non-operating obligation (assets) computed from the balance sheet.

The operating return represents profitability that is the core to firm value (Nissim and Penman, 2001). Use of this return recognizes that the creation of value is through the core operations of the company (Easton et al 2018). Separating the operating and financing components allows for the development of growth measures from the analysis of operating activities; the application of growth rates to the return on operating activities provides a basis for determining firm value. Weaknesses in operational internal controls could have a negative effect on the operating return. There is evidence of this effect related to mergers and acquisitions.

When an acquiring firm has ineffective controls prior to an acquisition, the post-acquisition period reveals a negative effect on operations (Harp and Barnes 2018). There is also evidence that ineffective inventory-related controls are associated with lower inventory turnover ratios (Feng, et al 2015), which is a component of operating return and indicates that the control weaknesses are related to a reduction in the productive use of assets. Both examples reflect decision-making at the firm level. However, the impact of ineffective controls may extend to external stakeholders who are interested in the analysis of returns on operating income.

Financial analysts use RNOA in various ways to evaluate companies. For example, Ychart, a cloud-based investment decision-making platform, uses RNOA in firm analysis and states, “It is a good indicator of how well a firm uses operating assets to create

profit. Investors are generally more interested in companies with higher RNOA."[1] Morningstar uses a similar metric termed return on invested capital (ROIC). Morningstar states that this measure "gives the clearest picture of exactly how efficiently a firm is using its capital, and whether its competitive positioning allows it to generate solid returns from that capital."[2] Morningstar further explains the need to compute the numerator (net operating profit after tax) and the denominator (net investment, measured as (Total Assets) - (Excess Cash) - (Non-Interest-Bearing Current Liabilities)). The Motley Fool uses the same metric to evaluate a firm's ability to create shareholder value.[3]

Companies also use operating returns in their annual reports and in bonus calculations. For example, Target computes return on invested capital (ROIC) in its MD&A, and measures the denominator as debt plus shareholders' equity less cash and cash equivalents, plus capitalized operating leases.[4] Nordstrom's ROIC computation defines the denominator as average total assets less average non-interest bearing current liabilities and average estimated capitalized leases and uses ROIC as a variable in its executive incentive computations.[5]

Nissim and Penman (2001) extend accounting-based valuation research by separating ROE into operating (RNOA) and non-operating returns, and then splitting RNOA into profit margin (PM) and asset turnover (ATO). Soliman (2008) states, "PM is often derived from pricing power, such as product innovation, product position, brand name recognition, first mover advantage, and market niches. ATO measures asset utilization and efficiency, which generally comes from the efficient use of property, plant, and equipment; efficient inventory processes; and other forms of working capital management." Profitability and efficient use of assets depends, in part, on internal controls, i.e., controls designed to mitigate the risk of net losses and inefficient use of

[1] https://ycharts.com/glossary/terms/return_on_net_operating_assets (last accessed June 5, 2017)
[2] http://news.morningstart.com/classroom2/course.asp?docID-145095&page=9 (last accessed June 5, 2017)
[3] http://www.fool.com/investing/general/2007/01/05/quick-accounting-basics-roic.aspx (last accessed June 5, 2017)
[4] https://www.sec.gov/Archives/edgar/data/27419/000002741916000043/tgt-20160130x10k.htm page 24 (last accessed June 5, 2017)
[5] https://www.sec.gov/Archives/edgar/data/72333/000007233316000260/jwn-1302016x10k.htm page 26 (last accessed June 5, 2017)

assets. Soliman (2008), following Fairfield and Yohn (2001), analyzes RNOA and its components by focusing on the *changes* in the components rather than in the levels of the measures.

The focus on RNOA provides analysts and investors with insights as to management's performance attributable to business operations, which represents a large portion of ROE. For the 34-year period ending in 2008, the average ROE in all publicly traded companies was 12.2%, and RNOA represents, on average, 84% of ROE (Schmidt 2016). For those investors that prefer companies with no debt, RNOA's percentage of ROE will be closer to 100%. For example, Warren Buffet prefers companies with little or no debt (Buffet and Clark 2002, p.129). For companies with no debt and excess cash, and assuming that the excess cash earns a return that is lower than the return on operations, ROE may be less than RNOA.

Non-operating return (RNØA)

Companies that do incur debt in general do so with the intention of borrowing money at a rate that is lower than the return on operations. These companies then have a portion of ROE that is attributable to financing decisions (RNØA***)***. Such decisions benefit the shareholders by increasing ROE. But, if the cost of debt is higher than the operating return, leverage is ineffective and will result in a decrease in ROE.

HYPOTHESES

To investigate the relationship between control effectiveness and firm performance, this paper begins with return on equity (ROE) and then disaggregates ROE into two components: operating and non-operating. The nonoperating return component of ROE is examined further to investigate the relationship between internal controls and financing activities. The operating component is further disaggregated into profit margin and asset turnover. The hypotheses are stated in the alternative form and address both level of performance and changes in performance.

The first research hypothesis addresses the relationship between return on equity and internal controls:

H1: Internal control effectiveness is associated with a higher return on equity. Improved (deteriorated) internal control effectiveness is associated with increased (decreased) return on equity.

An important aspect of financial statement analysis uses the return on net operating assets to focus on the profitability generated by operating activities. The second research hypothesis examines the relationship between internal control effectiveness and the return on net operating assets.

H2: Internal control effectiveness is associated with a higher return on net operating assets. Improved (deteriorated) internal control effectiveness is associated with increased (decreased) return on net operating assets.

DuPont analysis separates return on net operating assets into profit margin and asset turnover (Nissim and Penman 2001). Improvements in operational profitability caused by effective internal control could lead to a higher profit margin and/or asset turnover. This is investigated with the third hypothesis:

H3: Internal control effectiveness is associated with higher profit margin and asset turnover. Improved (deteriorated) internal control effectiveness is associated with increased (decreased) profit margin and asset turnover.

Finally, financial statement analysts can separate overall firm profitability (return on equity) into return on net operating assets and non-operating return. If effective internal control is primarily related to operating activities, then non-operating returns would not be higher for companies with effective ICFR as compared to companies with ineffective ICFR. Alternatively, if effective internal control also affects the cost of debt, then non-operating returns could also be higher for companies with effective ICFR as compared to companies with ineffective ICFR. Profitable companies can make their profits from operating activities, non- operating activities, or both. Therefore, the fourth research hypothesis is the following:

H4: Internal control effectiveness is associated with non-operating returns. Improved (deteriorated) internal control effectiveness is associated with increased (decreased)

non- operating returns.

METHODOLOGY AND RESULTS

Sample

The sample consists of firms with Research Insight data available to calculate the four profitability measures: ROE, RNOA, RNØA, and MARGIN along with an asset efficiency measure, TURNOVER. For proper calculation of RNOA it is required that its denominator, i.e., net operating assets, is positive. The resulting sample of firms are matched to Audit Analytics data on SOX 404 audit reports on internal control over financial reporting. The resulting sample is 19,445 firms from 2004 to 2017 which includes 18,569 with effective ICFR and 876 with ineffective. To reduce the impact of outliers the data is winsorized at the first and 99th percentiles.

Table 1: Descriptive statistics

Variable	N	Mean	Std Dev	Minimum	Maximum
ROE	19,445	0.052	0.313	-1.628	0.905
RNOA	19,445	0.057	0.431	-2.691	1.319
RNØA	19,445	0.000	0.430	-1.771	2.707
ProfitMar	19,445	0.008	0.359	-2.662	0.422
AssetTO	19,445	2.293	2.594	0.139	17.266
IC_Dummy	19,445	0.955	0.207	0.000	1.000
Cap intensity	19,445	6.521	2.129	1.824	11.742
Sales volatility	19,445	0.126	0.112	0.009	0.660
Growth	19,445	0.094	0.256	-0.504	1.285
Size	19,445	7.317	1.750	3.886	11.787
Loss	19,445	0.218	0.413	0.000	1.000
Pr_ROE	19,445	0.073	0.266	-1.137	0.947
Pr_RNOA	19,445	0.071	0.415	-2.516	1.395
Pr RNØA	19,445	0.012	0.407	-1.388	2.718
Pr profit mar	19,445	0.016	0.330	-2.378	0.432
Pr asset TO	19,445	2.345	2.630	0.144	17.452

The descriptive statistics for the sample are presented in Table 1. The average ROE, RNOA, RNØA, MARGIN for the sample firms are positive. The size of the firms, measured as the lagged market value, in the sample ranged from $48.7 million (ln = 3.886) to $131,531 million (ln = 11.787) with an average of $1,506 million (ln = 7.317).

Table 2 (shown in Appendix B) presents the Pearson correlation coefficients for the sample. As

would be expected, the return measures (ROE, RNOA, RNØA, MARGIN) are significantly positively related to each other. The measure of ICFR, IC_Dummy is positively significantly associated with all return measures. The control variables (CAP INTENSITY, SALES VOL, GROWTH, SIZE, and LOSS) are significantly related to the variables of interest, indicating that their inclusion in the analysis is important. As expected, each prior-year value of the return measures, as well as the TURNOVER measure, are positively significantly associated with the corresponding current- year measure.

Univariate Tests

Table 3 presents mean profitability measures for firms with effective and ineffective ICFR along with statistical comparisons between the two groups. Consistent with prior research, the mean ROE is higher for firms with effective ICFR compared to firms with ineffective ICFR. Further, the mean ROE for firms with ineffective controls is not only significantly lower (a 13.7% difference), but is negative. Because ROE represents the effect of both return on operations (RNOA) and the effect of non-operating activities (RNØA), these components are compared in this paper.

Table 3: Profitability and ICFR

	ICFR is Effective n=18,569	**ICFR is Ineffective n=876**	
Variable	*Mean*	*Mean*	*T stat (p-value)*
ROE	0.0587	-0.0786	12.7 *(<.0001)*
RNOA	0.0618	-0.0532	7.72 *(<.0001)*
RNØA	0.0017	-0.0350	2.47 *(0.0136)*
MARGIN	0.0118	-0.0815	7.52 *(<.0001)*
TURNOVER	2.3001	2.1511	1.66 *(0.0967)*

The results for RNOA are similar: firms with effective controls have a significantly higher return on operating assets than firms with ineffective controls. The mean for firms with ineffective controls is negative and is 11.5% lower than the mean for firms with effective ICFR. This is also true for RNØA, which reflects the return related to non-operating activities, i.e., financing and investing. For all four return measures investigated (ROE, RNOA, RNØA, MARGIN), the firms with effective internal controls significantly exceed those for firms with ineffective controls. The asset turnover ratio is higher for firms with effective ICFR than with those with ineffective ICFR. The

difference in the means is significant, but only at the 10% level.

Regression Analysis

Regressions are used to investigate the effect of internal controls on the financial statement analysis (FSA) variables of interest: ROE, RNOA, RNØA, MARGIN, and TURNOVER. Equation 1 shows the regression model:

$$\text{FSA variable}_t = \text{IC\_dummy}_t + \text{IC\_dummy}_{t-1} + \text{control variables}_{t-1} + \text{FSA variable}_{t-1} + e_t$$

(Equation 1)

The variables are defined in the Appendix, but the IC_dummy variables deserve special comment. IC_dummy is a dummy variable coded 1 if the firm reported effective controls in its 10-K filing (as retrieved from Audit Analytics), and 0 otherwise.

Table 4 presents the regression results. When ROE is the variable of interest, the results show that the IC_dummy variable for both the current year and the past year are significant ($p \leq 0.001$) and positively related to ROE. This is in support of the first hypothesis (H1: Internal control effectiveness is associated with a higher return on equity.) ROE is higher when the internal controls are effective in the current year by, on average 4.4% and the prior year (an approximate 4% increase on average). Of the control variables included, capital intensity, sales growth, the prior year's ROE, size, and loss are all significant, as expected. Sales volatility, while significantly correlated with ROE (see Table 2), is the only control variable that is not significant. It would seem that its impact is captured by the other variables in the regression. This regression model has an R^2 of .438, which indicates the model has a relatively high explanatory power.

The results for RNOA are similar to those of ROE. The IC_dummy variable for both the current year and the past year are significant ($p \leq 0.01$) and positively related to RNOA. This supports the second hypothesis (H2: Internal control effectiveness is associated with a higher return on net operating assets.) The R^2 is 0.599 with the model explaining about 60% of the variability of RNOA. The control variable results are mixed for the RNOA model. The size and prior-year return

coefficients are similarly positive and significant, but the capital intensity and loss coefficients switch signs, and the growth coefficient is not significant. The model explains about 60% of the variability of RNOA ($R^2 = 0.599$).

Table 4: Regression table

	ROE	RNOA	RNØA
IC_dummy	0.044***	0.027**	0.027*
IC_dummy1	0.039***	0.031**	0.013
Cap intensity	-0.008***	0.005*	-0.013***
Sales volatility	0.002	-0.031	0.026
Growth	-0.030***	-0.009	-0.047***
Pr_ROE	0.624***		
Pr_RNOA		0.768***	
Pr_RNØA			0.660***
Size	0.032***	0.016***	0.014***
Loss	-0.022***	0.018**	0.033***
Industry and year fixed effects	Yes	Yes	Yes
R^2	0.438	0.599	0.426
N	19,445	19,445	19,445
F-Statistic	23.57***	45.11***	22.48***

*, **, *** indicates significance at the $p \leq 0.05$, $p \leq 0.01$, and $p \leq 0.001$, respectively.
See Appendix A for variable definitions

When the dependent variable in the model is RNØA, the results are different. It is only the current year internal control variable (IC_dummy) that is significant. The prior year's internal control effectiveness does not impact current-year RNØA. Except for sales volatility, the control variables do continue to be significant. The explanatory power ($R^2 = 0.426$) remains relatively high. The fourth hypothesis *Internal control effectiveness is associated with a higher return on non-operating assets* is thus partially supported. The effective controls have only a marginal effect on the outcomes of financial decisions.

For the three return measures, the current-year effectiveness of internal controls has a significant, positive impact. The results are similar to what others have found; effective internal controls improve operational efficiency (e.g., Cheng, *et al.* 2018 and Feng, *et al.* 2015). It is to be expected

that improved operational efficiency will increase profitability and also improve the return measures from FSA.

Following the DuPont model, widely used in financial statement analysis, RNOA is decomposed into profit margin multiplied by asset turnover. Regression results for both of these variables are provided in Table 5. Not surprisingly, the results for profit margin are similar to those for the return measures just discussed. The profit margin is significantly and positively impacted by current-year internal control effectiveness, but not that of the prior year. The control variables are significant (with the exception of growth) and have the expected signs. The model does a good job of explaining the profit margin, as evidenced by the R^2 = .598. Asset turnover is positively (significantly) influenced by the current internal control effectiveness, but not that of the prior year. All control variables are significant with the expected signs. The explanatory power of the model is quite high; R^2 = .819. Thus, the results partially support the third hypothesis: H3: Internal control effectiveness is associated with higher profit margin and asset turnover.

Table 5: Regression table with the DuPont measures

	MARGIN	TURNOVER
IC_dummy	0.033***	0.128**
IC_dummy1	0.013	-0.036
Cap intensity	0.008***	-0.029***
Sales volatility	0.042*	1.085***
Growth	-0.002	-0.403***
Pr_Margin	0.796***	
Pr_Turnover		0.843***
Size	0.008***	0.025**
Loss	0.014**	0.252***
Industry and year fixed effects	Yes	Yes
R^2	0.598	0.819
N	19,445	19,445
F-Statistic	44.93***	137.21***

*, **, *** indicates significance at the $p \leq 0.05$, $p \leq 0.01$, and $p \leq 0.001$, respectively.
See Appendix A for variable definitions

The discussion to this point has focused on the levels of the variables of interest. However, to

gain additional understanding of the nature of the relationships, it is necessary to investigate the impact of changes in the variables. Three-year time intervals are used to evaluate changes in internal control effectiveness and changes in operating and non-operating returns. This analysis includes an examination of the change in profit margin and asset turnover, providing insights on the relationship between internal controls and profitability and efficient use of assets.

It may take time to experience a change in the return measures after a change in internal control effectiveness occurs. Because of this, the change in the return measures between year t and year t-2 (e.g., $ROE_t - ROE_{t-2}$) is examined. Changes in return measures for two groups of firms: 1) firms which were ineffective in year t-2 but were effective in years t-1 and t (improve) and 2) firms which were effective in year t-2 but were ineffective in years t-1 and t (deteriorate) are examined. Return changes for both of these groups of firms are compared to firms with effective internal control in all three years (stay effective).

These comparisons are examined by estimating a regression equation similar to equation 1 but with a dependent variable of returns changes. For independent variables, a dummy variable is set equal to one for improved or deteriorated ICFR firms and zero for stay effective. Changes in the equation 1 control variables between years t and t-2 and the return measure for year t-2 are included. Similar to the original regression analysis, variables are winsorized at 1 and 99% and there are controls for industry and year fixed effects.

Table 6 compares return changes for the 653 improve firms to the 16,240 stay effective. For the ROE change, the improved dummy coefficient (0.031) is positive and significant (p-value < 0.01). This implies that firms which remediate internal control weaknesses will, on average, experience a 3% increase in ROE in two years. There is a a similar result for the RNOA change (coefficient = 0.046; p-value < 0.01). The regression model, when the change in RNØA is the dependent variable, is not significant. For the profit margin and asset turnover changes, there are positive dummy coefficients (0.017 and 0.132, respectively) with p-values of 0.07 and less than 0.01, respectively. Consequently, there is evidence in support of H1 through H3 that improved internal

controls is associated with higher increases in ROAE, RNOA, profit margin, and asset turnover. But H4 that improved internal control is associated with higher increases in RNØA is not supported.

Table 6: Comparison of firms: Firms with three years of controls that are ineffective, effective, effective, vs. firms that stay effective for three years

Panel A Change in ROE, RNOA and RNØA

	ChROE	ChRNOA	ChRNØA
IEE (=1), StayE (=0)	.031**	.046**	-.031
Ch_Cap intensity	-.122***	-.111***	-.017
Ch_Sales volatility	.000***	.000*	.000
Ch_Growth	-.001	.000	-.001
LagPr_ROE	.049***		
LagPr_RNOA		-.009	
LagPr_RNØA			.010
Ch_Size	.101***	.088***	.024***
Ch_Loss	-.014*	-.025***	.004
Industry and year fixed effects	Yes	Yes	Yes
R^2	.1522	.0890	.0445
N	16,893	16,893	16,893
F-Statistic	3.77***	2.05***	.98

Panel B Change in Margin and Turnover

	ChMARGIN	ChTURNOVER
IEE (=1),StayE (=0)	.017	.132**
Ch_Cap intensity	-.055***	-.827***
Ch_Sales volatility	.000	.000***
Ch_Growth	-.000	.004
LagPr_Margin	.019**	
LagPr_Turnover		-.068***
Ch_Size	.036***	.040*
Ch_Loss	-.016***	.143***
Industry and year fixed effects	Yes	Yes
R^2	.1240	.1150
N	168,93	16,893
F-Statistic	2.98***	2.73***

*, **, *** indicates significance at the $p \leq 0.05$, $p \leq 0.01$, and $p \leq 0.001$, respectively. See Appendix A for variable definitions

Table 7 Comparison of firms: Firms with three years of controls that are effective, ineffective, ineffective vs. firms that stay effective for three years

Panel A Changes in ROE, RNOA, and RNØA

	ChROE	ChRNOA	ChRNØA
EII (=1), StayE (=0)	-.073**	-.0373	-.043
Ch_Cap intensity	-.119***	-.107***	
Ch_Sales volatility	.000***	.000**	-.020
Ch_Growth	-.001	-.000	.000
LagPr_ROE	.056***		
LagPr_RNOA		-.014	
LagPr_RNØA			.003
Ch_Size	.101***	.086***	.028***
Ch_Loss	-.015**	-.028***	.004
Industry/year fixed effects	Yes	Yes	Yes
R^2	.1563	.0901	.046
N	16,393	16,393	16,393
F-Statistic	3.77***	2.01***	.97

*, **, *** indicates significance at the p ≤ 0.05, p ≤ 0.01, and p ≤ 0.001, respectively. See Appendix A for variable definitions

Panel B Change in Margin and Turnover

	ChMARGIN	ChTURNOVER
EII (=1), StayE (=0)	-.045*	-.008
Ch_Cap intensity	-.049***	-.822***
Ch_Sales volatility	.000	.000
Ch_Growth	-.001	.003
LagPr_Margin	.026***	
LagPr_Turnover		-.072***
Ch_Size	.037***	.037
Ch_Loss	-.015***	.133***
Industry/year fixed effects	Yes	Yes
R^2	.1303	.1160
N	16,393	16,393
F-Statistic	3.05***	2.67***

*, **, *** indicates significance at the p ≤ 0.05, p ≤ 0.01, and p ≤ 0.001, respectively. See Appendix A for variable definitions

Table 7 compares return changes for the 153 deteriorated ICFR firms to the 16,240 firms for which the internal controls stayed effective. For the ROE change, the deteriorated dummy variable coefficient (-0.073) is negative and significant (p-value < 0.01). Firms with initially effective internal

controls which allow their controls to deteriorate can expect to experience a 7% decline in ROE (on average) in two years. However, the internal control dummy variable is not significant in the RNOA change regression and the RNØA change model is not significant overall.

For the profit margin change, there is a negative and significant coefficient (- 0.045; p-value = 0.019), but there is no significant impact for the IC dummy variable and the asset turnover change variable. Therefore, there is evidence in support of H1 and H3 that deteriorated internal control is associated with larger decreases in ROE and profit margin. But there is no evidence in support of H2, H3, and H4 that deteriorated internal control is associated with larger decreases in RNOA, asset turnover, and RNØA.

CONCLUSION

Discussion of Results

This paper examines the impact of SOX internal controls requirements on return measures in relation to financial statement analysis. The intent is to provide evidence that the effectiveness of internal controls over financial reporting extends to and is associated with a company's operations as reflected by common financial statement analysis ratios. This is of importance to analysts, management, and regulators.

The analysis includes variables that separate the core operating activities from the financing activities of a company. This is important since a company's core operations play a major role in the company's current and future profits and cash flows. Strong internal controls over financial reporting contribute to efficient and effective operations, and thus increase the return on operations. The effect of internal controls on financing decisions to discern what role, if any, effective controls play a role in non-operating returns is also investigated.

Effective controls in the current year and in the previous year are associated with increases in RNOA. Further analysis of RNOA indicates that the effective controls contribute to both profit margin and asset turnover. The associations with the non-operating return is less

apparent. Changes in controls are related to changes in overall and operating returns and to profit margin and asset turnover changes but not to changes in non-operating returns.

LIMITATIONS AND FUTURE RESEARCH

As with all empirical research, the results of this study are dependent upon operationalizing the variables and the appropriateness of the methodology. To better understand the effect of ICFR on operations and financial statement analysis, a more explicit examination of weaknesses would be beneficial, for example, examining weaknesses related to revenues and the effect on RNOA. In addition, further disaggregation of the DuPont model – profit margin and turnover – would provide more insights as to specific reasons for changes in RNOA. Lastly, this study controls for industry effect, but does not analyze the data by industry. An analysis of the banking industry, or a comparison of service firms to non-service firms would provide useful information to analysts.

REFERENCES

Alexander, C., S. Bauguess, G. Bernile, Y-H. Lee, and J. Marietta-Westberg (2013), "Economic effects of SOX Section 404 compliance: A corporate insider perspective", *Journal of Accounting and Economics* 56, 267-290.

Buffett, M. and D. Clark (2002), *The New Buffettology,* Rawson Associates. Scribner. New York, New York.

Callen, J. (1991), "Data envelopment analysis: Partial survey and applications for management accounting", Journal *of Management Accounting Research* 3, 1, 35-56.

Cheng, Q., B.W. Goh, and J.B. Kim (2018), "Internal control and operational efficiency", *Contemporary Accounting Research* 35, 2, 1102-1139.

Committee of Sponsoring Organizations of the Treadway Commission (COSO). 2013. *Internal Control-Integrated Framework*.

Costello, A., and R. Wittenberg-Moerman (2011), "The impact of financial reporting quality on debt contracting: Evidence from internal control weakness reports", *Journal of Accounting Research* 49, 1, 97-136.

Dhaliwal, D., C. Hogan, R. Trezevant, and M. Wilkins (2011), Internal control disclosures, monitoring, and the cost of debt", *The Accounting Review* 86, 4, 1131-1156.

Dowdell, T. D., D. N. Herda and M.A. Notbohm (2014), "Do management reports on internal control over financial reporting improve financial reporting?" *Research in Accounting Regulations* 26, 104-109.

Easton, P.D., M.L. McAnally, G.A. Sommers, and X. Zhang (2018), Financial *Statement Analysis & Valuation* Fifth Ed. Cambridge Business Publishers. Westmont, IL.

Fairfield, P.M. and T.L. Yohn (2001), "Using asset turnover and profit margin to forecast changes in profitability", *Review of Accounting Studies* 6, 4, 371-385.

Feng, M., C. Li, S. McVay, and H. Skaife (2015), "Does ineffective internal control over financial reporting affect a firm's operations? Evidence from firms' inventory management", *The Accounting Review* 90, 2, 529-557.

Financial Accounting Standards Board (FASB). (2018), Statement of Financial Accounting Concepts No. 8. *Conceptual Framework for Financial Reporting.* August 2018.

Ge, W., and S. McVayn (2005), "The disclosure of material weaknesses in internal control after the Sarbanes-Oxley Act", *Accounting Horizons* 19, 137-158.

Harp, N.L. and B.G. Barnes (2018), "Internal control weaknesses and acquisition performance", *The Accounting Review*, 91, 1, 235-258.

Kim, J., B.Y. Song, and L. Zhang (2011), "Internal control weakness and bank loan contracting: Evidence from SOX Section 404 disclosures", The *Accounting Review* 86, 4, 1157-1188.

Klamm, B.K., K.W. Kobelsky, and M. Weidenmeir Watson (2012), "Determinants of the persistence of internal control weaknesses", Accounting *Horizons* 26, 2, 307-333.

Klamm, B. K. and M. Weidenmeir Watson (2009), "SOX 404 reported internal control weaknesses: A test of COSO Framework components and information technology", *Journal of Information Systems* 23, 2, 1-23.

Kuhn Jr., J. R., Ahuja, M. and Muller, J. (2013), "An examination of the relationship of IT control weakness to company financial performance and health", International *Journal of Accounting and Information Management* 21, 227-240.

Lai, S., H. Li, H. Lin and F. Wu (2017), "The influence of internal control weaknesses on firm performance", Journal *of Accounting and Finance* 17, 6, 82-95.

Leech, T. and L. Leech (2011), "Preventing the next wave of unreliable financial reporting: Why US Congress should amend Section 404 of the Sarbanes-Oxley Act", International *Journal of Disclosure & Governance* 8, 4, 295-322.

Montana, J. (2007), "The Sarbanes—Oxley Act: Five years later", The *Information Management Journal* 41, 6, 48-53.

Nissim, D. and S. H. Penman (2001), "Ratio analysis and equity valuation: Form research to practice", Review *of Accounting Studies* 6, 109-154.

Schmidt, Michael (2016), Investopedia http://www.investopedia.com/articles/fundamental-analysis/09/financial-ratios.asp (last accessed June 5, 2017).

Soliman, M. T. (2008), "The use of DuPont analysis by market participants", The *Accounting Review* 83, 3, 823-853.

Stoel, M.D. and Muhanna, W. A. (2011), "IT internal control weaknesses and firm performance: An organizational liability lens", International *Journal of Accounting Information Systems* 12, 280-304.

Appendix A.
Variable Definitions

Variable	Definition
ROE	Return on average equity measured as net income divided by average stockholders' equity
RNOA	Return on net operating assets measured as operating income after tax divided by average net operating assets
RNØA	Return on net non-operating obligations measured as the difference between ROE and RNOA
MARGIN	Profit margin measured as operating income after tax divided by sales
TURNOVER	Asset turnover measured as sales divided by net operating assets
IC_DUMMY	Indicator variable equal to 1 for firms that reported effective internal controls in their annual filing; 0 for ineffective internal controls
IC_DUMMY_{t-1}	Indicator variable equal to 1 for firms that reported effective internal controls in their annual filing in previous year; 0 for ineffective internal controls
CAP INTENSITY	Natural logarithm of gross property, plant and equipment
GROWTH	Percentage sales growth
SALES VOLATILITY	Standard deviation of annual sales over the previous seven years
SIZE	Natural logarithm of market value of equity
LOSS	Indicator variable equal to 1 for firms that reported loss before extraordinary items; 0 for firms that reported income
PR_ROE	Prior year return on average equity
PR_RNOA	Prior year return on net operating assets
PR_RNØA	Prior year return on net non-operating obligations
PR_MARGIN	Prior year profit margin
PR_TURNOVER	Prior year asset turnover
ChROE	Change in ROE between year t and year t-2
ChRNOA	Change in RNOA between year t and year t-2
ChRNØA	Change in RNØA between year t and year t-2
ChMARGIN	Change in MARGIN between year t and year t-2
ChTURNOVER	Change in TURNOVER between year t and year t-2

Appendix B.

Table 2 - Pearson Correlation Table

	ROE	*RNOA*	*RNØA*	*PM*	*ASSETTO*	*IC_ DUMMY*	*CAP INTENSITY*	*SALES*	*GROWTH*	*SIZE*	*LOSS*	*PR_ROE*	*PR_ RNOA*	*PR_ RNØA*	*PR_PM*	*PR_ ASSETTO*
ROE	1.00															
RNOA	0.638 ***	1.00														
RNØA	0.134 ***	-0.620 ***	1.00													
PM	0.597 ***	0.700 ***	-0.306 ***	1.00												
ASSETTO	0.075 ***	0.084 ***	-0.041 ***	0.018 *	1.00											
IC_DUMMY	0.091 ***	0.055 ***	0.018 *	0.054 ***	0.012	1.00										
CAP INTENSITY	0.193 ***	0.190 ***	-0.053 ***	0.228 ***	-0.248 ***	0.085 ***	1.00									
SALES VOL	-0.050 ***	-0.020 **	-0.019 **	-0.023 **	0.439 ***	-0.017 *	-0.224 ***	1.00								
GROWTH	0.014 *	0.025 ***	-0.027 ***	0.020 **	-0.000	-0.008	-0.110 ***	-0.049 ***	1.00							
SIZE	0.328 ***	0.270 ***	-0.029 ***	0.255 ***	-0.125 ***	0.108 ***	0.759 ***	-0.226 ***	0.020 **	1.00						
LOSS	-0.436 ***	-0.386 ***	0.081 ***	-0.355 ***	-0.004	-0.076 ***	-0.201 ***	0.098 ***	-0.113 ***	-0.336 ***	1.00					
PR_ROE	0.603 ***	0.478 ***	-0.020 **	0.409 ***	0.050 ***	0.068 ***	0.201 ***	-0.058 ***	0.090 ***	0.351 ***	-0.672 ***	1.00				
PR_RNOA	0.476 ***	0.760 ***	-0.486 ***	0.552 ***	0.072 ***	0.040 ***	0.171 ***	-0.006	0.068 ***	0.268 ***	-0.509 ***	0.650 ***	1.00			
PR_RNØA	-0.083 ***	-0.542 ***	0.636 ***	-0.357 ***	-0.034 ***	0.006	-0.057 ***	-0.043 ***	-0.008	-0.047 ***	0.089 ***	0.033 ***	-0.685 ***	1.00		
PR_PM	0.445 ***	0.583 ***	-0.307 ***	0.740 ***	-0.020 **	0.036 ***	0.236 ***	-0.035 ***	0.086 ***	0.266 ***	-0.489 ***	0.595 ***	0.713 ***	-0.399 ***	1.00	
PR_ASSETO	0.097 ***	0.119 ***	-0.062 ***	0.023 **	0.897 ***	0.006	-0.247 ***	0.438 ***	0.050 ***	-0.110 ***	-0.053 ***	0.115 ***	0.147 ***	-0.065 ***	0.017 *	1.00

*, **, *** indicates significance at the $p \leq 0.05$, $p \leq 0.01$, and $p \leq 0.001$, respectively.