

Using Nonfinancial Measures to Assess Fraud Risk

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Disclosure

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RESEARCH REPORT SUMMARY

For several decades, the audit profession has attempted to find efficient and effective methods of improving auditors' fraud risk assessments so as to enhance audit quality, reduce auditor liability, and improve investor protection. This study examines whether internal and external auditors or other interested parties (e.g., directors, lenders, investors or regulators) can effectively use nonfinancial measures to assess the reasonableness of financial performance and help detect financial statement fraud (hereafter, fraud). If nonfinancial measures (e.g., facilities growth) can be identified that are correlated with financial measures (e.g., revenue growth), inconsistent patterns between the nonfinancial and financial measures can be used to detect organizations with high fraud risk. We find that the *difference* between nonfinancial measures and financial performance is significantly greater for fraud organizations than for their nonfraud competitors. In short, for fraud organizations, the performance portrayed by their financial statements is not supported by their nonfinancial measures. Overall, our results provide empirical evidence suggesting that nonfinancial measures can be effectively used to assess the likelihood of fraud.

I. INTRODUCTION

During former HealthSouth CEO Richard Scrushy's trial, federal prosecutors argued that Scrushy must have known something was amiss with HealthSouth's financial statements since there was a discrepancy between the organization's financial and non-financial performance. The prosecutor noted that twice during the seven-year fraud, revenues and assets increased even though the number of HealthSouth facilities decreased. "And that's not a red flag to you?" asked prosecutor Colleen Conry during the trial (WSJ 2005). Conry's question implied:

Because HealthSouth's financial statement data was inconsistent with its nonfinancial measures, the risk of financial statement fraud (hereafter, fraud) at HealthSouth was obviously high. The defense witness responded that the inconsistency was not apparent at the time and — importantly — HealthSouth's external auditors also failed to take note of the inconsistency.

This investor brief summarizes our academic paper (see Brazel et al. 2008 for the full academic paper) that investigates whether publicly available nonfinancial measures (NFM) can be used to assess the likelihood of fraud. Examples of NFMs include number of employees, number of retail outlets, square footage of production facilities, and number of patents. NFMs are typically presented in the management discussion and analysis alongside financial statements in organizations' 10K filings and annual reports.

Using a matched-pair sample of fraud organizations and nonfraud competitors, we show that fraud organizations are more likely than nonfraud organizations to report inconsistent revenue growth relative to their growth in NFMs. In short, we show that there is a close relationship between revenue growth and NFM growth for nonfraud organizations, but for fraud organizations, revenue growth is not supported by corresponding growth in NFMs. Thus, we provide evidence showing that comparisons between financial measures and NFMs can be effectively used to assess fraud risk.

This paper is organized in five sections. Section II develops our hypothesis. Section III explains our sample selection and research method. Section IV provides the results, and Section V concludes the summary.

II. HYPOTHESIS DEVELOPMENT

Prior Research

The use of NFMs in evaluating organization performance has garnered much attention since Kaplan and Norton (1996) published the “The Balanced Scorecard.” Proponents of using NFMs claim they are not subject to the limitations of traditional financial measures (i.e., short-term focus, emphasis on narrow groups of stakeholders, and limited guidance for future actions; see Langfield-Smith 2003). Professional auditing standards suggest that auditors should consider NFMs when determining the reasonableness of their clients’ financial statements (SAS No. 56, AICPA 1988).

The effectiveness of using NFMs to help assess fraud risk is dependent on whether NFMs are correlated with current financial performance. If NFMs are correlated with current financial performance and auditors can detect fluctuations in NFMs that appear unusual given reported financial performance, NFMs may help auditors (both internal and external) and others assess fraud risk. Prior research has found relationships between financial measures and NFMs (e.g., Ittner and Larcker 1998). For example, in the retail industry, Lundholm and McVay (2006) find that growth in retail outlets and same-store sales data can be modeled to provide sales forecasts that are as accurate as analysts’ forecasts.

In addition to this research, anecdotal evidence suggests that considering NFMs in conjunction with financial results should help auditors identify fraudulent financial statements. For example, Delphi Corporation appears to have boosted net income through sham sales of assets during a period when Delphi and its competitors were laying off workers and experiencing production cuts (Lundegaard 2005). Similar to the HealthSouth prosecutor’s comments noted previously, it appears that Delphi’s auditors might have detected this fraud if they had noted the inconsistency between the organization’s reported performance and its NFMs. In addition, both short-sellers and fraud examiners appear to consider NFMs when evaluating the reasonableness of sales growth that exceeds expectations (Eisinger 2005).

The Public Company Accounting Oversight Board (PCAOB) has recognized the potential for NFMs to be a powerful, independent benchmark for evaluating the validity of financial statement data and recently endorsed their usage to improve fraud detection (PCAOB 2007). The main reason that NFMs may be a good test of the validity of financial reports is that manipulating some NFMs may be difficult to accomplish and/or conceal. First, while financial controls can be overridden by management and financial statements are produced internally, some NFMs are produced and reported by independent sources (e.g., customer satisfaction ratings produced by J.D. Power and Associates). Second, when management reports an NFM it may be verifiable by an auditor (e.g., number of acquisitions, production facilities, or employees) whereas many financial results can be difficult to verify (e.g., the estimation of the allowance for doubtful accounts). Third, if management attempts to manipulate its NFMs to conceal a fraud, it will need to expand the perpetrator pool to conceal the misstated NFM. For example, if a CFO needs to report an increase in the number of employees to support an overstatement of revenue, he or she

will probably need to involve human resources and payroll personnel to ensure that the misstated NFM agrees to their records and is therefore concealed. Last, the manipulation of an NFM involves another set of data that management will need to falsify and therefore adds complexity to the act of fraud.

Example

We provide an example of a fraud organization where a comparison of financial and nonfinancial measures suggested fraud was occurring. Del Global Technologies (Del) makes electronic components, assemblies, and systems for medical, industrial, and defense uses. The U.S. Securities and Exchange Commission (SEC) alleges that in fiscal years 1997-2000, Del engaged in improper revenue recognition when it held open quarters, prematurely shipped products to third-party warehouses, and recorded sales on products that Del had not yet manufactured (SEC 2004). Del overstated pretax income in 1997 by at least US \$3.7 million or 110 percent. Del's revenue *increased* 25 percent from US \$43.7 million in 1996 to US \$54.7 million in 1997. However, Del reported a *decrease* in the total number of employees over the same period. Employees decreased from 440 in 1996 to 412 in 1997. In addition, Del's total number of distributors also *decreased* from 400 to 250 from 1996 to 1997. This case illustrates how an unusual relationship between NFMs (i.e., total number of employees and of distribution dealers) and financial data (i.e., revenue) could help an auditor assess fraud risk. In contrast, one of Del's competitors, Fischer Imaging Corp., realized a 27 percent decrease in revenue over the same period accompanied by a comparable 20-percent decrease in employees and a 7-percent decrease in distributors.

Hypothesis

One general challenge in studying fraud is a shortage of data; this study is no exception. Levitt and Dubner (2005) posit that one reason academics know very little about the practicalities of fraud is the paucity of good data. Ideally, a study of NFMs would focus on common NFMs, which are industry specific. Compiling a reasonable database of fraud organizations in one industry is problematic because publicized fraud cases are costly but rare. To overcome this limitation, we construct a measure that is consistent across organizations in different industries with different NFMs. We do so by using NFMs with an expected positive correlation with revenue and determining whether inconsistencies between revenue growth and NFM growth discriminate between fraud and nonfraud organizations.¹ For example, we select the number of retail outlet stores as an NFM for an organization in the retail industry. Then, we examine the difference between an identified fraud organization's percentage change in revenue and percentage change in retail outlets from the year before the fraud to the year of the fraud. We

¹ With respect to our sample, we focus on revenue frauds, revenue as a financial performance measure, and NFMs related to firm capacity that should be correlated with revenues. We concentrate our analyses on revenues due to the concentration of frauds and restatements related to improper revenue recognition. SAS No. 99 explicitly advises auditors that revenue recognition should be considered a high fraud risk area and, consequently, auditors should compare recorded revenue amounts with relevant NFMs. In addition, any future PCAOB guidance on fraud is likely to contain required procedures related to revenue recognition (e.g., Beasley et al. 1999; AICPA 2002; PCAOB 2004; Gullapalli 2005).

then compare this difference with that of an industry competitor with the expectation that the difference between revenue growth and the growth in the NFM will be larger for fraud organizations than for their nonfraud competitors. Then we test the hypothesis:

H1: Fraud organizations will have greater differences between their percent change in revenue growth and percent change in NFMs than their non-fraud competitors.

III. SAMPLE SELECTION AND RESEARCH METHOD

Sample

Our fraud sample includes organizations charged by the SEC with having fraudulently reported revenue on at least one 10-K filing. We identified our fraud sample from three sources. First, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) published “Fraudulent Financial Reporting: 1987-1997 — An Analysis of U.S. Public Companies” (Beasley et al. 1999). This study investigated frauds that were identified in SEC Accounting and Auditing Enforcement Releases (AAERs) issued during the years 1987–1997. Second, we performed our own AAER search for AAERs issued during the years 1998–2007. We used “fraud” as a search term. Our third source came from searching the popular press (e.g., *The Wall Street Journal*). Our final fraud sample consists of 50 fraud organizations that, according to the SEC, intentionally manipulated revenues. For our analysis of only one NFM available on the Compustat database, number of employees, our sample size expands to 110 fraud organizations. The frauds in our sample occurred during a 10-year period between 1993 and 2002. Table 1 provides the frequency of observations across industries (Panel A) and years (Panel B).

TABLE 1

<i>Frequency of Observations Across Industries</i>			
<i>Panel A:</i>			
SIC Code	Industry	Number	Percent
1300-1399	Oil and Gas Extraction	1	2%
1600-1699	Heavy Construction	1	2%
2000-2099	Food and Kindred Products	1	2%
2300-2399	Apparel and Other Finished Products	3	6%
2600-2699	Paper and Allied Products	1	2%
2800-2899	Chemicals and Allied Products	1	2%
3100-3199	Leather and Leather Products	1	2%
3300-3399	Primary Metal Industries	1	2%
3400-3499	Fabricated Metal Products	1	2%
3500-3599	Industrial and Commercial Machinery and Computer Equipment	5	10%
3600-3699	Electronic and Other Electrical Equipment and Components	4	8%
3800-3899	Measuring, Analyzing, and Controlling Instruments	5	10%
4800-4899	Communications	1	2%
4900-4999	Electric, Gas, and Sanitary Services	3	6%
5000-5099	Wholesale Trade - Durable Goods	2	4%
5100-5199	Wholesale Trade - Nondurable Goods	1	2%
5300-5399	General Merchandise Stores	1	2%
5600-5699	Apparel and Accessory Stores	1	2%
5900-5999	Miscellaneous Retail	2	4%
7300-7399	Business Services	12	24%
7900-7999	Amusement and Recreation Services	1	2%
8000-8099	Health Services	1	2%
		50	100%

*Frequency of Observations Across Years**Panel B:*

Year	Number	Percent
1994	2	4%
1995	1	2%
1996	1	2%
1997	12	24%
1998	11	22%
1999	7	14%
2000	11	22%
2001	4	8%
2002	1	2%
	50	100%

Table 2 presents the types of alleged accounting fraud in our sample organizations as obtained from the AAERs.

TABLE 2*Type of Alleged Accounting Fraud*

Accounts and Other Factors Involved in Fraud	Number of Organizations	% of Fraud Sample
Revenues	50	100%
Accounts Receivable/Allowance for Doubtful Accounts	33	66%
Expenses	17	34%
Other Assets	16	32%
Inventory	9	18%
Debt	6	12%
Cost of Sales	5	10%
Accounts Payable and Other Accrued Expenses	5	10%
Related Parties	2	4%
Acquisitions and Mergers	2	4%
Other Gains/Losses	1	2%
Total	146 *	

* Does not sum to the number of organizations in the sample because of the dual-entry nature of accounting (i.e., early revenue recognition generates a fraudulent credit to revenue and debit to accounts receivable) and several organizations are accused of engaging in multiple types of fraudulent behavior (e.g., manipulation of revenue and expenses).

Methodology for Collecting NFM Data

Students enrolled in undergraduate and graduate auditing courses at three universities performed the duties of selecting the nonfraud competitors and collecting NFM data for our sample of fraud organizations. Emulating audit practice, we asked the students to assume the role of staff assistant with each student assigned to a different auditee (i.e., fraud organization) and informed them that their audit task involved NFM collection for the client and a competitor of their choice. The students were also told the current fiscal year-end under audit (initial fraud year) and the prior fiscal year-end (pre-fraud year). We also provided the students with three of the client's closest competitors (nonfraud organizations) as identified by Hoover's Online database.

Students were then instructed to collect up to four quantitative NFMs (along with the source references), which were identical for both the client and one competitor of their choosing for the initial fraud year and the prior fiscal year-end. We instructed the students to target NFMs that have positive contemporaneous correlations with revenue. The students were asked to perform an exhaustive search of 10-Ks, Hoover's Online, Proquest, ABI-Inform, LexisNexis, Standard and Poor's Market Insight, and Google for NFMs for each fraud organization and one competitor of their own choosing. It should be noted that the majority of NFMs were obtained from 10-K filings publicly available to investors.

Our sample includes all NFMs that were quantitative, nonfinancial, and had a relation to firm capacity. For example, several NFMs involved the capacity of the organization's operational space available, including square feet of operations, manufacturing space, floor space, and warehousing space. Other measures involved the number of facilities available to the organization such as the number of retail outlets, number of facilities, and number of stores. Some measures were explicitly given the label of capacity by the organization, including annual capacity in tons and energy-producing capacity. Others were deemed to reflect capacity such as gas reserves, distribution dealers, and number of product lines.

Models

We create a variable that measures the difference between the percent change in revenue and the percent change in NFMs for each fraud organization and competitor. The difference for each organization is measured from the year before the fraud to the year of the fraud. The variable is measured as follows:

$$\text{CAPACITY DIFF}_t = \text{REVENUE GROWTH}_t - \text{NFM GROWTH}_t$$

where,

REVENUE GROWTH	= (Revenue _t – Revenue _{t-1}) / Revenue _{t-1}
NFM GROWTH	= (NFM _t – NFM _{t-1}) / NFM _{t-1}
REVENUE	= Total Revenue
NFM	= Nonfinancial Measure
t	= Initial year of the Fraud

Hypothesis 1 posits that fraud organizations will have, on average, a greater value for CAPACITY DIFF than nonfraud organizations (i.e., competitors). When we were able to collect multiple NFMs for a matched pair, we used the *average* change in NFMs to calculate CAPACITY DIFF.

As an alternative test of Hypothesis 1, we examine whether our hypothesis is supported using one form of NFM — total number of employees (Compustat data #29). We refer to this variable as EMPLOYEE DIFF. In sum, we calculate EMPLOYEE DIFF for 110 matched pairs (220 observations) as opposed to the 50 matched pairs (100 observations) for CAPACITY DIFF.

IV. RESULTS

Table 3 provides descriptive statistics for our study's two main variables of interest: CAPACITY DIFF and EMPLOYEE DIFF.

TABLE 3

Descriptive Statistics and Comparison of Means for Fraud and Nonfraud Samples

Variable		Mean	Difference	Median
CAPACITY DIFF	Fraud=F	0.30		0.28
	No Fraud=NF	0.11	0.19 **	0.09
EMPLOYEE DIFF	F	0.20		0.14
	NF	0.04	0.16 ***	0.03

Significance Levels: ***<.01, **<.05, *<.1

All variables are defined as follows: t = year of the fraud. Statistics for CAPACITY DIFF are derived from the sample of 50 fraud organizations and 50 control organizations and statistics for EMPLOYEE DIFF are derived from a sample of 110 fraud organizations and 110 control organizations. $CAPACITY\ DIFF_t = REVENUE\ GROWTH - NFM\ GROWTH$. $REVENUE\ GROWTH = ((Revenue_t - Revenue_{t-1}) / Revenue_{t-1})$ and $NFM\ GROWTH = ((NFM_t - NFM_{t-1}) / NFM_{t-1})$. NFM is Nonfinancial Measure. If an organization has more than one capacity NFM, then we use the average NFM GROWTH to calculate CAPACITY DIFF. $EMPLOYEE\ DIFF = REVENUE\ GROWTH - EMPLOYEE\ GROWTH$. $EMPLOYEE\ GROWTH = (Employees_t - Employees_{t-1}) / Employees_{t-1}$.

Hypothesis 1 predicts a greater difference between revenue growth and NFM growth (CAPACITY DIFF) for the fraud sample than for the nonfraud sample. The results in Table 2 support Hypothesis 1 as CAPACITY DIFF is significantly greater ($p < .05$) for the fraud sample relative to the sample of nonfraud competitor organizations. Thus, for fraud organizations, there appears to be a larger inconsistency between the performance portrayed by their financial statements and that portrayed by their NFMs. For their competitors we observe a mean CAPACITY DIFF of .11. For nonfraud organizations, revenues appear to grow faster than their NFMs, but the percentage difference appears reasonable given the expected noise between financial statement data and NFMs. However, for the fraud organizations, we observe a much larger mean CAPACITY DIFF of .30. Thus, Hypothesis 1 is supported in that fraud organizations appear to have greater differences between their percent change in revenue growth and percent change in NFMs than their nonfraud competitors. A greater CAPACITY DIFF may be indicative of greater fraud risk. For auditors, investors, regulators, or other parties that are examining CAPACITY DIFF in future applications, our descriptive results provide a benchmark for a reasonable CAPACITY DIFF (.11) and what might be considered unreasonable (.30) and therefore require an explanation from management. The results are stronger for EMPLOYEE DIFF ($p < .01$). It is interesting to note the close relationship between revenue growth and employee growth for nonfraud organizations (mean EMPLOYEE DIFF = .04).

V. CONCLUDING COMMENTS

The purpose of this research summary is to document whether comparing financial data to NFMs can aid auditors and others in assessing fraud risk. We investigate whether organizations that fraudulently misstate their financial statements are less likely to concurrently misstate NFMs that are indicative of their true financial condition. We predict and find that fraud organizations have greater differences in percent change in revenue growth and percent change in NFMs than their nonfraud competitors.

Our findings have implications for future audit practice and other parties interested in assessing fraud risk. First, the prior literature suggests that fraud goes undetected when auditors fail to understand the environments in which organizations operate (Erickson et al. 2000). We provide evidence suggesting that fraud risk assessment models that incorporate NFMs can help prevent these failures. Thus, understanding the various NFMs for the industries in which an audit client operates and comparing the NFMs to reported financial results has the potential to be a powerful fraud detection tool. Substantial differences between financial statement data and NFMs should serve as a red flag to auditors and lead them to ask pointed questions of management, corroborate and test management's responses, and, if necessary, serve as a tipping point for consulting forensic specialists. Second, our study provides empirical evidence to support policy makers who currently are considering the required use of NFMs in auditing standards (e.g., PCAOB 2004). Last, our descriptive results provide auditors and other parties (e.g., investors, directors, regulators) with benchmarks as to what might be unreasonable inconsistencies between financial performance and NFMs.

REFERENCES

- American Institute of Certified Public Accountants (AICPA). 1988. *Statement on Auditing Standards No. 56: Analytical Procedures*. New York City: AICPA.
- , 2002. *Statement on Auditing Standards No. 99: Consideration of Fraud in a Financial Statement Audit*. New York City: AICPA.
- Beasley, M., J. Carcello, and D. Hermanson. 1999. *Fraudulent Financial Reporting: 1987-1997 An Analysis of U.S. Public Companies*. Committee of Sponsoring Organizations of the Treadway Commission.
- Brazel, J. F., K. Jones, and M. Zimbelman. Using Nonfinancial Measures to Assess Fraud Risk. Working Paper, North Carolina State University. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=886545
- Eisinger, J. "Cerner's Growth has Been Healthy, But Its Accounting Could Be Ailing." *The Wall Street Journal*. (December 14, 2005): C1.
- Erickson, M., B. Mayhew, and W. Felix. 2000. "Why Do Audits Fail? Evidence from Lincoln Savings and Loan." *Journal of Accounting Research* 38 (Spring): 165-194.
- Gullapalli, D. "To Err is Human, to Restate Financials, Divine: Companies Redo Reports in Record Numbers, Partly Due to Sarbanes-Oxley." *The Wall Street Journal* (January 20, 2005): C3.
- Hogan, C. E., Z. Rezaee, R. A. Riley, and U. Velury. 2006. *Financial Statement Fraud: Insights from the Academic Literature*. Working Paper. Michigan State University.
- Ittner, C. and D. Larcker, 1998. "Are Nonfinancial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction." *Journal of Accounting Research* 36 (Supplement): 1-35.
- Kaplan, R. and D. Norton. 1996. *The Balanced Scorecard*. Boston, MA: Harvard Business School Press.
- Langfield-Smith, K., 2003, *Management Accounting*, 3rd edition, McGraw-Hill.
- Levitt, S. D. and S. J. Dubner. 2005. *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*. New York, NY: HarperCollins.
- Lundegaard, K. 2005. "Delphi Discloses Accounting Problems." *The Wall Street Journal* (March 7, 2005): A3.

Lundholm, R. and S. McVay. 2006. Forecasting Sales: A Model and Some Evidence from the Retail Industry. Working Paper. University of Michigan.

Public Company Accounting Oversight Board (PCAOB). 2004. PCAOB Standing Advisory Group Meeting: Meeting Agenda (September 8-9). Available at: http://pcaobus.org/News_and_Events/Events/2004/09-08-09.aspx.

PCAOB. 2007. Observations on Auditors' Implementation of PCAOB Standards Relating to Auditors' Responsibilities with Respect to Fraud. Available at: http://pcaob.org/inspections/other/01-22_release_2007-001.pdf.

U.S. Securities and Exchange Commission (SEC). 2004. Accounting and Auditing Enforcement Release No. 2027.

The Wall Street Journal (WSJ). 2005. "Defense Expert: HealthSouth Fraud Too Complex for Detection." May 6.

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