Fraudulent financial reporting and cash flows

Henry Elrod
University of the Incarnate Word

Megan Jacqueline Gorhum
University of the Incarnate Word

ABSTRACT

Financial statement fraud in the United States may average $100 billion per year (Association of Certified Fraud Examiners, 2008). This study was to determine the extent, if any, that correlations between (a) cash flows from operating activities and (b) earnings from continuing operations were different for firms with detected financial reporting fraud compared to firms without detected financial reporting fraud. This information may be important to auditors, security analysts, investors, regulators, and other users of financial statement information. The study included analysis of the correlations between the dependent variables for a fraud sample of firms with detected fraudulent financial reporting, compared to a control group sample of firms without detected fraudulent financial reporting.

For the control group the correlation between cash flow from operating activities and income from continuing operations was positive and strong, at .96, and positive but moderate at .45 for the fraud group. The difference in the r values was significant and the hypothesis of equality of the correlations was rejected (z = 25.05, a = .05, p (2-tailed test) 0.0).

Recent historic relationships between cash flows from operating activity and income from continuing operations may be examined, taking note of unexplained changes. Unexplained substantive changes in the relationship between cash flows from operating activities and earnings from continuing operations may be taken as warranting further examination and investigation

Keywords: Fraud, financial reporting, cash flows, accounting.

INTRODUCTION

Auditors, accountants, investors, financial analysts, regulators, and others need financial statements free of material misstatement, whether caused by error or fraud (Financial Accounting Standards Board, 1978), and therefore are interested in identifying fraudulent financial reporting. Financial statement fraud in the United States is estimated to average $100 billion per year (Association of Certified Fraud Examiners, 2008). The research reported in this paper was to examine the extent to which analysis of the relationship between (a) cash flows from operating activities and (b) earnings from continuing operations might be used to detect financial reporting fraud.

Financial statement fraud has become a problem in the United States (Albrecht, Albrecht, & Albrecht, 2006; Sessions, 1990; Wells, 1997). The recent media attention of the fraud committed by WorldCom, Enron, and others, have brought the issue into public view, as seen by the response of the United States Congress' enactment of the Sarbanes-Oxley Act. ("Public Company Accounting Reform and Investor Protection Act," 2002). The Occupational fraud losses in the United States may be as much as $994 billion per year, and financial statement reporting fraud may average as much as $100 billion per year (Association of Certified Fraud Examiners, 2008).

The central premise of the research was to examine the extent to which analysis of the relationship between (a) cash flows from operating activities and (b) earnings from continuing operations may be used to detect financial reporting fraud. These dependent variables, cash flows from operating activities and earnings from continuing operations, were chosen for the focus of the research because of the simplicity if the idea: a simple measure may become a more practical tool for stakeholder users of financial statements. By intuition based on understanding of the principles of double entry bookkeeping, financial statement users grasp the relationship of these two elements, and acknowledge, at least for fraud involving revenue recognition and accounts receivable, financial statement reporting fraud is an independent variable that should affect the relationship of cash flows and earnings. In its simplest form, for instance, if fictitious sales are recorded as credit sales, the receivables will not convert into cash receipts, and the relationship between cash flows from operating activities and earnings from continuing operations will be disrupted.

Two research questions were developed to guide the focus of the statistical analysis of the relationship between cash flows from operating activities and earnings from continuing operations:

Q1: To what extent, if any, was there a correlation between (a) cash flows from operating activities and (b) earnings from continuing operations?

Q2: To what extent, if any, were the correlations between (a) cash flows from operating activities and (b) earnings from continuing operations different for firms with detected financial reporting fraud compared to firms without detected financial reporting fraud?

Previous research (Elrod, 2010) using quasi-experimental static pre and post treatment tests, did not show significant differences in the ratios cash flows from operating activities and earnings from continuing operations, for samples firms engaged in fraudulent financial reporting compared to a control group without identified financial reporting fraud. The current research was intended to build on the work of Beneish (1999), Lee et al. (1999), Dechow et al. (1995) and Elrod, to determine whether cash flows from operating activities and earnings from continuing operations were indeed statistically related, and whether that relationship was different for firms

with financial statement reporting fraud compared to a control group without financial statement reporting fraud. This information may be useful to auditors, regulators, investors, and others in detecting fraudulent financial statement reporting.

STUDY

The primary independent variable driving the correlation between (a) cash flows from operating activities and (b) earnings from continuing operations was fraudulent financial reporting, particularly involving revenue recognition and accounts receivable. The dependent variables were cash flow from operating activities and earnings from continuing operations. Data sets were drawn, including the components of the cash flows from operating activities, income from continuing operation, total assets, total revenues, and other descriptive and identifying points such as company name, ticker symbol, industrial classification number, etc. There were two primary data sets: (a) a control group drawn at random from a the securities listed on the New York Stock Exchange, excluding mutual funds, exchange traded funds, real estate investment trusts, and the like, (b) a group of companies that had engaged in financial reporting fraud, as noted in the press and in Securities and Exchange Commission Litigation reports. The fraud group was further classified into data before restatement of their financial statements, and the fraud group after discovery and restatement of their financial statements.

There is anecdotal evidence in the accounting and fraud detection literature to indicate the size of a firm, measured either in assets or revenues, may be a component contributing to the relative strength (weakness) of firms' internal accounting control systems, and ceteris paribus, a contributor to financial statement reporting fraud (Albrecht, et al., 2006; Association of Certified Fraud Examiners, 2008). Additionally, Albrecht, et al. note that in financial statement reporting fraud, the most common accounts manipulated are accounts receivable and revenues. Size as a factor in fraud prediction models has been partially confirmed in the academic literature (Beneish, 1999). Accordingly, in this research size was deemed a secondary independent variable.

The null hypotheses for the research were: (a) there were no statistically significant differences in the correlations between cash from operating activities and earnings from continuing operations (i.e., the components of the cash ratio) among the three data groups, and (b) there were no statistically significant differences in the correlations between the components of the cash ratios when the data groups are subdivided according to the relative sizes of the firms represented in each group.

Additionally, the null hypothesis of no statistical difference in the correlations between (a) revenue and assets, (b) revenue and cash flows from operating activities, (c) revenue and income from continuing operations, (d) assets and cash flows from operating activities, (e) assets and income from continuing operations, and (f) cash flows to income from continuing operations was tested for the fraud sample, for firms above and below the mean assets in the sample.

RESULTS

The *r* values for each of the data groupings are set out in Table 1. The statistic used to evaluate the significance of the difference in two independent correlations, *z*, was calculated following the method recommended by Fisher (Aczel & Sounderpandian, 2006). Results were confirmed by the statistic u to evaluate the difference between two correlations, as computed by

the correlation comparison computation software available at http://peaks.informatik.uni-erlangen.de/cgi-bin/usignificance.cgi, following the procedures outlined therein (Maier, 2009).

The analysis confirmed size measured by total assets as a factor in the correlations between the income from continuing operations and cash flows from operating activities. The *r* values, presented in Table 3, compare the relationships between (a) revenue and assets, (b) revenue and cash flows from operating activities, (c) revenue and income from continuing operations, (d) assets and cash flows from operating activities, (e) assets and income from continuing operations, and (f) cash flows to income from continuing operations. The figures above the diagonal represent results of calculations for firms engaged in fraudulent financial reporting, before restatement, with assets above the mean assets for the group. The figures below the diagonal represent results of calculations for firms engaged in fraudulent financial reporting, before restatement, with assets below the mean assets for the group. Table 4 shows the results for testing the significance of the difference in the *r*'s from Table 3, for the hypothesis $r_1 = r_2$.

The results of the research were that there was a predicted statistical correlation between the cash from operating activity and earnings from continuing operations components of the cash ratio, for both the control group and the fraud sample. For the control group the correlation between cash flow from operating activities and income from continuing operations was positive and strong, at .96, and positive but moderate at .45 for the fraud sample. The difference in the r values was significant and the hypothesis of equality of the correlations was rejected (z = 25.05, a = .05, p (2-tailed test) 0.0). For the control group, as predicted, the correlations between revenue and cash flows from operating activity, and between revenue and income from continuing operations, were positive and strong at r = .96 and .98, respectively. For the fraud sample, correlations between revenue and cash flow for operating activity, and between revenue and income from continuing operations were positive and moderate, at r = .66 for the revenue to cash flow statistic, and positive and weak at r = .17 for the revenue to income from continuing operations correlation. As the data in Table 2 show, the correlations for the control group were statistically different from those for the fraud group, and the hypotheses of equality of the r values were rejected (metrics in Table 2.)

For the fraud sample, bifurcated above and below mean total assets, the correlations between cash flows from operating activities and income from continuing operations were positive and moderate (r = .48 above the mean and .38 below the mean), and these correlations were not statistically different (a = .928, p (2-tailed test) .3212) from one another. See Tables 3 and 4 for the other tests and metrics.

CONCLUSION

This study confirmed the intuitive notion that, for firms without known fraud, users of financial statements may expect a strong positive correlation between cash flows from operating activities and income from continuing operations. These results showed the correlations between cash flows from operating activities and income from continuing operations were positive and moderate for firms with known fraudulent financial reporting involving sales or accounts receivable. The differences between the strong correlations for the control group and the moderate correlations in the fraud group were statistically significant. This information should be useful to auditors, regulators, investors and other users of financial statements. For a given firm, recent historic relationships between cash flows from operating activity and income from continuing operations may be examined, taking note of changes in that relationship not explained

or explainable by reference to changes in company policy such as terms of sale or credit policy, or circumstances such as substantial change in product mix, etc. Such unexplained substantive changes in the relationship between cash flows from operating activities and earnings from continuing operations may be taken as warranting further examination and investigation.

FURTHER STUDY

The magnitudes of the changes in the relationship between cash flows from operating activities and earnings from continuing operations, in the presence of fraud, and the direction of such changes may be subjects for further study. Additional areas for further study along the lines of studies of this kind, as well as the previous work by Dechow (1995), Benish (1999), Lee, et al. (1999), and others are confounded in two ways. First, data from firms where financial reporting fraud is present are tainted, by their fraudulent natures. Such data contain fraudulent elements by definition, including attempts by management to mask their fraudulent activities. Second, control group data, intended to be free from fraudulent financial reporting, but being representative of the general population, must have some fraudulent content, as yet undiscovered. Accordingly, data from either group, fraud sample or control group, may not behave has expected. These two phenomena may also warrant further study.

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APPENDIX

Table 1

r values for correlations among the variables as a function of fraud.

		1	2	3	4	*M*	*SD*
1	Revenue	-	.77	.96	.98	28.95	254.41
2	Assets	.69	-	.81	.80	86.83	334.32
3	Cash flow, operations	.66	.68	-	.97	4.88	35.97
4	Income continuing operations.	.17	.28	.45	-	2.33	18.35
M		4.19	11.82	0.56	-0.05		
SD		12.80	61.33	4.77	3.31		

Note: Control group is above the diagonal; $n = 420$. Fraud group before restatement is below the diagonal; $n = 594$. Means and standard deviations in millions.

Table 2

z values for significance of differences in *r*'s from fraud & control samples (Table 1) for $r_1 = r_2$.

	R			
	Fraud sample	Control sample	z ($\alpha=.05$)	p (2-tail)	
Revenue v. assets	.69	.77	2.69	<0.01	Reject
Revenue v. cash flows from operations	.66	.96	18.03	0.0	Reject
Revenue v. income from cont. operations	.17	.98	33.40	0.0	Reject
Assets v. cash flows from operations	.68	.81	4.66	0.0	Reject
Assets v. income from cont. operations	.28	.80	12.68	<.001	Reject
Cash flows v. income from cont. operations	.45	.97	25.05	0.0	Reject

Note: n for fraud sample = 594; n for control group = 420.

Table 3

r values for correlations among the variables in the fraud sample, as a function of size.

		1	2	3	4	*M*	*SD*
1	Revenue	-	.61	.67	.25	28.58	26.70
2	Assets	.63	-	.65	.33	4.89	16.61
3	Cash flow, operations	.50	.33	-	.48	97.19	159.47
4	Income continuing operations.	.26	.25	.38	-	-.52	9.86
M		1.09	.97	.049	.005		
SD		3.15	1.91	.191	.275		

Note: Fraud group before restatement, above mean total assets is above the diagonal; $n = 67$.
Fraud group before restatement, below mean total assets, is below the diagonal; $n = 527$.
Means and standard deviations in millions.

Table 4

z values for significance of differences in r's from fraud sample (Table 3) for $r_1 = r_2$.

	r, fraud sample				
	Below mean	Above mean	z $(\alpha=.05)$	p (2-tail)	
Revenue v. assets	.61	.63	2.45	.4929	Reject
Revenue v. cash flows from operations	.67	.50	1.97	.4759	Reject
Revenue v. income from cont. operations	.25	.26	.081	.0319	Accept
Assets v. cash flows from operations	.65	.33	3.27	.4994	Reject
Assets v. income from cont. operations	.33	.25	.660	.2454	Accept
Cash flows v. income from cont. operations	.48	.38	.928	.3212	Accept

Note: n for above the mean = 67; n for below the mean =5 27; both from the fraud sample.