

# Analyzing Earnings Quality as a Financial Forensic Tool

## WHY EARNINGS QUALITY

Earnings quality is an important aspect of evaluating a company's financial health. It has been studied since at least 1934, as referenced in Graham and Dodd's *Security Analysis*. Indeed, Warren Buffett considers the book's guidance as one of the four most treasured books that he owns.<sup>1</sup> Earnings Quality relates to the ability of a company's reported earnings to best symbolize its true earnings. Earnings quality also refers to the stability, or lack thereof, in a company's reported earnings.

Analysts, investors and management have deployed dozens of forensic indices that aid the forensic accountant in assessing the probability of earnings manipulation by a suspect company. The wide variety of forensic indices was developed to evaluate earnings quality, and identify whether a company's financial statements may potentially reflect manipulated earnings. The quality of a company's earnings is one facet of an investigation that is often overlooked in the financial forensic process.

This article discusses various aspects of earnings quality, and discusses a method for detecting earnings manipulation. The Beneish M-Score Model (Beneish Model), deployed as a financial forensic tool, can assist in evaluating the probability of earnings manipulation in a company, as well as identifying areas that may require greater scrutiny.

## DETERMINING EARNINGS QUALITY

Earnings quality focuses on the extent to which the reported net income deviates from the actual, true earnings of a company. A review of a company's earnings over time may be an indica-

tion of how consistent, and repeatable, the earnings are for a particular period and in the future. However, as the financial statements are the responsibility of the company's management, transactions can be structured to best achieve a desired accounting result by reporting key financial transactions to the company's advantage. Therefore, the impact of a given transaction can vary from company to company, as well as between different industries. In addition, the earnings determination process becomes more problematic, and increasingly difficult to benchmark, as a result of the myriad reporting practices that individual companies employ to report profits, such as operating earnings, net income and income before taxes. All of these differing factors create variability, which could increase the chances that a company's reported earnings may have been manipulated, and not uncovered.

Some examples of accounting manipulations to be aware of when examining financial statement data for a company's earnings quality include:

- Recording revenue too soon or with questionable quality
- Recording fictitious revenue
- Boosting income with one-time gains
- Shifting current expense to a different period
- Capitalizing otherwise currently recognizable expenses
- Failing to record, or improperly reducing, liabilities

The earnings reported by a company are a result of its accounting methods, in conjunction with its customary business practices. In this connection, accruals function as temporary adjustments to address the timing of compa-



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ny transactions by providing management's best assumptions and estimates. As a result, accruals could represent acceptable accounting estimates, based on rational assessments of the future, or a prime management tool for committing earnings manipulation. Although large accruals are not automatically an indication of fraud, the forensic accountant should be aware that a fundamental component of many financial statement frauds is centered on earnings manipulation utilizing accruals. It is often difficult to differentiate between the two, but the magnitude and purpose of accruals can be used as a barometer to assist the forensic accountant in the detection of earnings manipulation.

The balance sheet, income statement and statement of cash flows are interrelated and should be analyzed together. When the numbers within these statements do not make sense, a more in-depth investigation is

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## expert TIP

The Beneish M-Score Model (Beneish Model), deployed as a financial forensic tool, can assist in evaluating the probability of earnings manipulation in a company, as well as identifying areas that may require greater scrutiny.

required. Generally, the statement of cash flows may be considered a more objective measure of performance, and a better predictor of a company's true earnings and future stability. A disparity between a company's reported high net income and its low cash flow should prompt an investigation.

**DETECTING EARNINGS MANIPULATION**

One quantitative forensic indexing method developed to assist in detecting whether a company has manipulated its earnings is the Beneish Model, developed by Professor Messod Beneish.<sup>2</sup> The Beneish Model is similar to the Altman Z-Score,<sup>3</sup> but is used to uncover earnings manipulation rather than as a predictor of bankruptcy. Companies with higher Beneish scores are more likely to be manipulators. In his study, Beneish's Model was able to identify as many as three quarters of the companies who had manipulated their earnings. The Beneish Model can be calculated by using a company's annual financial statements, and differentiates manipulators from non-manipulators by applying variables from the financial statements. Further investigation must be completed to identify potential legitimate causes for resulting abnormalities.

The Beneish Model uses eight financial variables viewed as being indicators of companies prone to financial statement manipulation. There is an increased probability for manipulation when company financial statements reveal statistically significant changes in accounts receivable, deteriorating gross margins, decreasing asset quality, sales growth and increasing accruals, among others.

The eight variables employed in the Beneish Model are presented below as "indexes" to avoid confusion with financial "ratios" (note: the current year financial statement numbers are indicated as "cy" and the prior year financial statement numbers are indicated as "py"):

1) *Days' Sales in Receivables Index* (DSRI) – Measures the ratio of the days

that sales are in accounts receivable, and benchmarks this ratio against the prior year. A result of greater than 1.0 would indicate that accounts receivable, as a percentage of sales, has increased from the prior year. Therefore, although a disproportionate increase in accounts receivable relative to sales could be the result of a company's normal operations, such as legitimate end-of-month sales or general business credit deci-

$$\frac{\frac{\text{Accounts Receivable (cy)}}{\text{Sales (cy)}}}{\frac{\text{Accounts Receivable (py)}}{\text{Sales (py)}}}$$

sions, it may also be indicative of inflated revenues.

2) *Gross Margin Index* (GMI) – Measures the ratio of a company's prior year's gross margin to the current year's gross margin. The company's gross margin has deteriorated when the results are greater than 1.0. Gross margin deterioration is a negative indicator of a company's prospects, making such companies more prone to manipulate earnings.

$$\frac{\frac{\text{Sales (py)} - \text{Cost of Sales (py)}}{\text{Sales (py)}}}{\frac{\text{Sales (cy)} - \text{Cost of Sales (cy)}}{\text{Sales (cy)}}}$$

3) *Asset Quality Index* (AQI) – Measures the quality of a company's assets by calculating the ratio of non-current assets, other than plant, property and equipment (PPE), to total assets. It indicates the amount of total assets that are less certain to be ultimately realized, identified as asset quality. An AQI greater than 1.0 indicates that the company has potentially increased its cost deferral or increased its intangible assets, and created earnings manipulation. Therefore, the greater the AQI, indicating a reduction in asset quality, the greater the probability of earnings manipulation.

$$\frac{1 - (\text{Current Assets (cy)} + \text{PPE (cy)}) / \text{Total Assets (cy)}}{1 - (\text{Current Assets (py)} + \text{PPE (py)}) / \text{Total Assets (py)}}$$

4) *Sales Growth Index* (SGI) – A result of greater than 1.0 represents sales growth compared to that of the prior year. Sales growth itself is not indicative of earnings manipulation, however, growth companies are more likely to commit earnings manipulation.

$$\frac{\text{Sales (cy)}}{\text{Sales (py)}}$$

5) *Depreciation Index* (DEPI) – A DEPI greater than 1.0 may be an indication of an upward revision of the estimated lives of a company's property, plant and equipment, which would increase its income.

$$\frac{\frac{\text{Depreciation Expense (py)}}{\text{Depreciation Expense (py)} + \text{PPE (py)}}}{\frac{\text{Depreciation Expense (cy)}}{\text{Depreciation Expense (cy)} + \text{PPE (cy)}}}$$

6) *Sales, General and Administrative Expenses Index* (SGAI) – Measures the ratio of a company's SGAI to sales. A disproportionate increase in sales, as compared to SGAI, would serve as a negative indication concerning a company's future prospects.

$$\frac{\frac{\text{Sales, General and Administrative Expenses (cy)}}{\text{Sales (cy)}}}{\frac{\text{Sales, General and Administrative Expenses (py)}}{\text{Sales (py)}}}$$

7) *Total Accruals to Total Assets Index* (TATA) – Accruals, calculated in this formula as working capital<sup>4</sup> other than cash, are estimates of the short term forecasted inflow and outflow activities of a company. Excluding any major changes within the company, these accruals should be fairly consistent within some acceptable measure of statistical variation. However, accruals have consistently provided a conventional opportunity to perpetrate

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$$\frac{(\text{Working Capital (cy)} - (\text{py})) - (\text{Cash (cy)} - (\text{py})) + (\text{Income Tax Payable (cy)} - (\text{py})) + (\text{Current Portion of Long Term Debt (cy)} - (\text{py})) - \text{Deprec. \& Amort. Expense (cy)}}{\text{Total Assets (cy)}}$$

**Total Assets (cy)**

a fraud. As a result, higher positive accruals are associated with the potential for earnings manipulation, as shown above.

8) *Leverage Index (LVGI)* – Measures the ratio of a company’s total debt to total assets. When the LVGI is greater than 1.0, it indicates an increased leverage and, therefore, a company more prone to financial statement manipulation.

$$\frac{\text{Long Term Debt (cy)} + \text{Current Liabilities (cy)}}{\text{Total Assets (cy)}}$$

$$\frac{\text{Long Term Debt (py)} + \text{Current Liabilities (py)}}{\text{Total Assets (py)}}$$

Although each variable can be used individually to assess a specific component of a company’s financial statement data, the Beneish Model takes a company’s results of these eight variables and applies them in the following formula:

$$M = -4.84 + (0.92 * DSRI) + (0.528 * GMI) + (0.404 * AQI) + (0.892 * SGI) + (0.115 * DEPI) - (0.172 * SGAI) + (4.679 * TATA) - (0.327 * LVGI)$$

The figure of -4.84 is applied as a constant in the formula, and each of the eight variables is multiplied by its respective constant number. When applying the Beneish Model, a score of greater than -2.22 (i.e., less of a negative) is an indication that the company’s financial statements may have been manipulated.

**APPLICATION OF THE BENEISH M-SCORE MODEL**

The following two companies have been well-publicized for earnings manipulation of their respective financial statements. The forensic indices from the Beneish Model had been applied to these two companies for a

specific year, prior to when the company fraud was reported to the public. The results are quite interesting, and revealing, from the perspective of a financial forensic application.

**Enron Corporation**

Enron Corporation (Enron) represented one of the largest fraud scandals in the history of the United States. Before its collapse in 2001, Enron was number 7 on the *Fortune* list of the 500 largest companies. At that time, Enron was known as one of the most advanced, and well-regarded, businesses in the world.

Enron employed an assortment of deceptive and fraudulent accounting practices to obscure its actual financial position. However, there were financial forensic warning signs revealed in the Company’s financial statements prior to its downfall and eventual bankruptcy filing on Decem-

ber 2, 2001. Two of these warning signs were how Enron measured, and reported, its total revenues, and its negative operating cash flows. However, the biggest red flag in Enron’s financial statements were signs of poor earnings quality as indicated by several key forensic measures.

The application of the Beneish Model to Enron’s financial statements indicated that the Company may have been manipulating its earnings as far back as 1997. The calculations for the first two columns of Table 1, below, represent the Beneish findings<sup>5</sup> and categorize the companies into two groups, non-manipulators and manipulators. The column to the right, titled Enron, represents the results of applying the Beneish Model to Enron’s 1997 financial statements.

Table-1 demonstrates that Enron scored close to, or higher, than manipulators in three of the eight variables: Gross Margin Index (GMI), Asset Quality Index (AQI) and Sales Growth Index (SGI).

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**Table 1**  
**Enron Corporation**  
**Benchmarking to the Beneish M-Score Model**  
**Per Beneish-Mean<sup>6</sup>**

Variables	Non-Manipulators	Manipulators	Enron <sup>7</sup>
Days in Sales in Receivables (DSRI)	1.031	1.465	0.625
Gross Margin (GMI)	1.014	1.193	1.448
Asset Quality (AQI)	1.039	1.254	1.308
Sales Growth (SGI)	1.134	1.607	1.526
Depreciation (DEPI)	1.001	1.077	1.017
Sales, General and Administrative (SGAI)	1.054	1.041	0.649
Total Accruals to Total Assets (TATA)	0.018	0.031	0.012
Leverage (LVGI)	1.037	1.111	1.041

Based upon its financial statements, the gross margin for Enron decreased from 21.15 percent in 1996 to 14.61 percent in 1997, and then to 6.22 percent in 2000.<sup>8</sup> Enron's *Gross Margin Index* of 1.448 exceeded the mean index of 1.193 for the manipulators' category by 21.4 percent.

The *Asset Quality Index* for Enron of 1.308 was higher than the manipulators mean index of 1.254, and 25 percent greater than the mean of 1.039 for non-manipulators.

The *Sales Growth Index* for Enron was 1.526, which represented an index close to the mean of manipulators as determined by the Beneish Model. Enron used inflated revenues as its strategy in order to give the impression to outside investors that the Company was an innovative, high-growth investment. In the four-year period prior to its collapse, Enron's reported revenues increased from \$13.3 billion in 1996 to \$100.8 billion in 2000, representing an incredible 750 percent gain. The growth of Enron's reported revenues for the period 1999<sup>9</sup> to 2000, from \$40.1 billion to \$100.8 billion, was 151 percent and unprecedented in any industry.

The overall result for Enron when applying the Beneish Model calculations was -1.89, which is greater than the -2.22 standard used to measure the likelihood of manipulation. This result places Enron as a potential candidate of financial statement earnings manipulation in 1997, years before the fraud became public.

The detailed calculations for Enron, using the Beneish Model, are presented in Table 2 at top right.

**ZZZZ Best Company, Inc.**

Another real life example of financial statement earnings manipulation was the ZZZZ Best Company, Inc. (Z-Best), and the activities of its founder Barry Minkow. Z-Best appeared to be an extremely successful carpet-cleaning and restoration company, but was a façade for a massive Ponzi scheme. In January 1986, Z-Best went public. Three years later, in 1989, Mr. Minkow

**Table 2**  
**Calculation of the Beneish M-Score Model**  
**Applied to Enron's 1997 and 1996 Financial Statements**

$$M = -4.84 + 0.92 \cdot DSRI + 0.528 \cdot GMI + 0.404 \cdot AQI + 0.892 \cdot SGI + 0.115 \cdot DEPI - 0.172 \cdot SGAI + 4.679 \cdot TATA - 0.327 \cdot LVGI$$

$$M = -4.84 + (0.92 \cdot 0.625) + (0.528 \cdot 1.448) + (0.404 \cdot 1.308) + (0.892 \cdot 1.526) + (0.115 \cdot 1.017) - (0.172 \cdot 0.649) + (4.679 \cdot 0.012) - (0.327 \cdot 1.041)$$

$$M = -4.84 + .5750 + .7645 + .5284 + 1.3612 + .1170 - .1116 + .0561 - .3404$$

$$M = (1.8898) \text{ rounded to } (1.89) = \text{greater (less of a negative) than } (2.22)$$

was sentenced to 25 years in prison for securities fraud, money laundering, tax evasion, and other charges.

Table 3 below is a summary of selected variables calculated from Z-Best's 1986 financial statements, and compares the results of four mean variables from the Beneish Model.

*Days' Sales in Receivables Index* for manipulators, according to the Beneish Model, had a mean index of 1.465, and Z-Best's index was an incredible 177,622. Z-Best had no accounts receivable in 1985, but reported almost \$700,000 in 1986. It was determined later that the 1986 accounts receivable were fictitious.

The mean *Asset Quality Index* is 1.039 for non-manipulators and 1.254 for manipulators. Z-Best had an index of 2.043, or 63 percent higher than the mean for manipulators, and 97 percent higher than the mean for non-manipulators. Z-Best's AQI of 2.043 at the end of 1986 was the result of increased non-current (soft) assets. Z-Best, as with many companies that commit fraud, was guilty of capitalizing certain expenditures as deferred costs. At December 31, 1985, Z-Best's non-current assets were approximately 40 percent of its total assets. By December 31,

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**Table 3**  
**ZZZZ Best Company, Inc.**  
**Benchmarking to the Beneish M-Score Model**  
**Per Beneish-Mean<sup>10</sup>**

Variables	Non-Manipulators	Manipulators	Z-Best <sup>11</sup>
Days in Sales in Receivables (DSRI)	1.031	1.465	177,622
Asset Quality (AQI)	1.039	1.254	2.043
Sales Growth (SGI)	1.134	1.607	3.905
Total Accruals to Total Assets (TATA)	0.018	0.031	0.064

1986, the non-current assets represented over 65 percent of Z-Best's total assets.

The mean *Sales Growth Index* for non-manipulators and manipulators was 1.134 and 1.607, respectively. Z-Best had an astonishing index of 3.905, or a 143 percent increase over the mean manipulators. Sales growth by itself is not an indicator of fraud. However, Z-Best, being a company in a growth mode, was more inclined to commit fraud due to the pressures placed upon it to continue its pattern of rapidly growing sales. Sales increased from \$1,240,534 in 1985 to \$4,845,347 in 1986, almost 300 percent. Not surprisingly, fictitious sales were part of Z-Best's fraudulent financial reporting.

*Total Accruals to Total Assets* for non-manipulators had a mean index of 0.018, and the manipulators' category had a mean index of 0.031. Z-Best's index of 0.064 was over 100 percent higher than the mean manipulators' category.

**CONCLUSION**

Quality of earnings continues to be an important element in the investigation of a company's financial statements. The accrual quality, a component of earnings quality, can be determined by the extent these accruals ultimately are realized in the company's cash flows.

The Beneish Model starts with utilizing the existing analytical ratios and applies its indexes to develop a strong predictor of earnings manipulation. The strength of the Beneish Model is that it applies eight unique indices, both individually and collectively. Therefore, the forensic accountant can deploy these findings to develop a roadmap for further investigation. 

<sup>1</sup> Warshavsky, Mark S., contributing author to *Financial Forensics Body of Knowledge*, Dorrell & Gadawski; John Wiley & Sons, Inc., New York, 2012.  
<sup>2</sup> Beneish, M.D., "The Detection of Earnings Manipulation," *Financial Analyst Journal*: 24-36, June, 1999.  
<sup>3</sup> Altman, Edward I., "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," *The Journal of Finance*, September, 1968, Vol. 23, No. 4, pages 589-609.  
<sup>4</sup> The term "working capital" is mentioned for brevity as Professor Beneish's TATA formula does not use this term. Instead, his formula uses the actual formula for working capital of current assets minus current liabilities.  
<sup>5</sup> Beneish, M.D., "The Detection of Earnings Manipulation," *Financial Analyst Journal*: 24-34, June, 1999, Table 2.  
<sup>6</sup> Beneish, M.D., "The Detection of Earnings Manipulation," *Financial Analyst Journal*: 24-34, June, 1999, Table 2.  
<sup>7</sup> Enron Corporation financial statements for the years 1996 and 1997.  
<sup>8</sup> Enron Corporation financial statements for the year 2000.  
<sup>9</sup> Enron Corporation financial statements for the year 1999.  
<sup>10</sup> Beneish, M.D., "The Detection of Earnings Manipulation," *Financial Analyst Journal*: 24-34, June, 1999, Table 2.  
<sup>11</sup> ZZZZ Best Company, Inc. financial statements for the years 1985 and 1986.

Tuesday, May 10, 2011

**Transaction Databases Update - Pratt's Stats, BIZCOMPS and the IBA**  
(Jim Hitchner, Marci Bour)

1. Which of the transaction databases do you use for small companies such as less than \$1 million? (*can pick more than one*)
  - a. BIZCOMPS – 72%
  - b. DoneDeals – 11%
  - c. IBA – 42%
  - d. Mergerstat – 10%
  - e. Pratt's Stat – 74%
  
2. Which of the transaction databases do you use for larger companies such as greater than \$20 million? (*can pick more than one*)
  - a. BIZCOMPS – 28%
  - b. DoneDeals – 28%
  - c. IBA – 13%
  - d. Mergerstat – 42%
  - e. Pratt's Stat – 82%
  
3. If you only have the usual minimal data concerning a transaction do you usually rely on transaction databases as:
  - a. A primary method and value – 2%
  - b. A secondary or corroborating method and value – 76%
  - c. Dismiss the method and value as unreliable – 22%
  
4. Have you ever had trouble defending your use of transaction databases where there was only minimal data?
  - a. Yes – 51%
  - b. No – 49%
  
5. Do you use the IBA Direct Market Data Method?
  - a. Yes – 33%
  - b. No – 67%
  
6. Where there is minimal data on the transactions what is the minimum range of transactions that can be relied upon?
  - a. Zero – 3%
  - b. One or two – 1%
  - c. Three to five – 19%
  - d. Six to ten – 50%
  - e. More than ten – 26% 

