



White Paper

Earnings Quality Analytics

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Introduction

Earnings quality analysis has long been regarded as the portfolio manager's best defense against low quality financial reporting. In particular, earnings quality analysis has been used extensively by portfolio managers to identify companies that are expected to under-perform relative to the market. And it has undoubtedly been useful in providing advanced warning of a number of accounting-related scandals, including Enron, MicroStrategy, and Cendant.

Given the traditional focus of earnings quality analysis – identifying stocks that are likely to under-perform – it is not surprising that recent academic research supports the value of earnings quality analysis in identifying stocks that are likely to under-perform. And, while not widely known, research also shows that measures of earnings quality are useful in identifying stocks that are likely to outperform the market.

Gradient Analytics' *Earnings Quality Analytics* is the first service of its kind to provide a balanced approach to earnings quality analysis – allowing you to identify stocks that are likely to outperform (due to high earnings quality) as well as stocks those that are likely to under-perform (due to low earnings quality). Specifically, *Earnings Quality Analytics* systematically analyzes the quality of earnings for the top 5,000 securities (ranked by market capitalization) using a proprietary statistical model. The findings of our statistical models are then backed up by traditional fundamental-based, earnings quality analysis performed by a team of highly experienced analysts. The end product is a highly unique research service that can help portfolio managers generate higher returns and more effectively manage risk.

Overview of Earnings Quality Analysis

The U.S. accounting profession and the Securities Exchange Commission (SEC) have worked diligently through the years to develop the most rigorous system of accounting procedures in the world. Nevertheless, there is still a significant gap (appropriately called the “*expectations gap*”) between what investors and creditors expect and what the accounting profession can deliver.

The expectations gap exists in part because publicly traded companies have a great deal of discretion in choosing accounting principles and in making estimates that impact their reported financial results.¹ Under Generally Accepted Accounting Principles (GAAP), the amount of discretion that a company has in preparing financial statements is controlled by two fundamental principles of accounting: conservatism² and objectivity³. However, in reality these two guiding principles are often stretched to the limit or ignored.

¹ The other important cause of the expectations gap is the nature of the assurance role that the auditing profession fulfills. While the investment community expects that the vast majority of accounting irregularities should be detectable by the auditor, in reality this is not the case. The auditing profession and its client base (publicly-held corporations) as a whole have made a conscious (cost-benefit) decision to use a sampling approach to the review of accounting events. In other words, transactions and other accounting issues are only reviewed on a sample basis. Thus, significant accounting issues sometimes go undetected during the audit.

² Under the conservatism principle, when choosing among alternative accounting procedures, the accountant should choose the procedure(s) that produce the lowest net income (and net assets).

³ Information is considered objective if succeeds in measuring what it is intended to measure, without bias.

When Conservatism or Objectivity is Impaired, Earnings Quality is Compromised

While, in theory, a firm's accounting staff should employ procedures that are objective and conservative, in practice, management has many competing motivations that drive their choice of accounting policies and influence their periodic estimates. Because of these competing motivations, many companies manipulate accounting numbers in order to facilitate the financial reporting goals established by management. In this regard, virtually all firms use earnings management techniques to present financial results in a particular light (i.e., overstate or understate their true profitability or financial condition).⁴ The challenge, therefore, is to identify companies that are significantly misstating their true profitability by aggressive accounting.

For example, from 1998-2000 *MicroStrategy, Inc.* adopted an extremely aggressive revenue recognition policy that, while not in technical violation of GAAP, had the effect of substantially overstating the company's true profitability. It wasn't until the SEC mandated a change in the way that technology companies account for contract revenue that the market ascertained the extent of the overstatement (although earnings quality analysis revealed the deception prior to the change in accounting rules).⁵ After the SEC mandated change, MicroStrategy was twice forced to restate its earnings and its shares fell over 98% in the ensuing 12-month period. Similarly, Enron used an extremely aggressive scheme of off-balance-sheet financing in order to hide mounting losses. The end result was arguably one of the most spectacular financial reporting disasters in history. Those unlucky enough to hold Enron shares during this period lost close to 100% of the value of their investment.

Finally, it should be noted that earnings quality problems are not always the direct result of intentional acts by management. For example, the quality of inventories at *Lucent Technologies* (as reported in their first quarter 10Q filed May 2000) suggested an apparent backlog of inventory that indicated a possible slowdown on the horizon. In all likelihood, this was (at least initially) a case of earnings quality problems resulting from unintentional acts (slow sales). Nevertheless, Lucent's earnings continued to disappoint and the stock was down more than 85% in the ensuing twelve months. (Subsequent evidence suggests that there may also have been some intentional misstatements on the part of Lucent management in order to hide the magnitude of the sales slowdown.)

How do companies manipulate earnings?

Despite the efforts of the accounting profession to ensure objectivity and conservatism, it is still relatively easy to manipulate accounting numbers through either unethical (but not necessarily

⁴ While it may seem counter intuitive, it is important to note that sometimes companies have incentive to understate their earnings. For example, Microsoft could have been motivated to understate its profitability while the justice department considers breaking up the company. Similarly, companies often understate profit in one period then overstate profits in an adjacent period in order to make their earnings stream "smooth". This is commonly referred to as "smoothing" or "earnings management."

⁵ In response to perceived abuses involving aggressive recognition in the technology industry, the SEC issued Staff Accounting Bulletin (SAB) 101a. This change effectively required MicroStrategy and others to restate their earnings in order to ratably amortize contract revenues (rather than recording the majority of revenues at the time that the contract was signed).

illegal) and/or fraudulent means. The list presented below provides a high level overview of how management can manipulate accounting numbers.

1. Recording transactions incorrectly – For example, recording a long-term contract as though all revenue were earned up front in order to improve current period sales and profits.
2. Recording transactions early – For example, backdating a large sale in order to boost current quarter (or current year) profits.
3. Recording transactions late – For example, forward-dating a large sale in order to smooth revenues and profits between adjacent quarters (or years).
4. Misstating percentages or amounts involved in a transaction – For example, lowering the estimated percentage of sales returns in order to overstate net sales and profits for the period.
5. Misstating the amounts of assets or liabilities – For example, failing to write down the value of impaired assets (loans that are uncollectible, inventory that is outdated, etc.) in order to improve both reported profitability and financial condition.
6. Changing accounting methods or estimates for no substantive reason – For example, changing the company’s method of accounting for bad debts solely to reduce the dollar amount estimated bad debts and increase reported profits. (A substantive reason for changing the method of bad debt estimation would be in order to obtain a more accurate estimate.)
7. Using related party transactions to alter reported profits – For example, engaging in transactions with an unconsolidated subsidiary at favorable prices to the parent – thereby shifting profits to the parent company.
8. Recording fictitious transactions or amounts – Although rare and clearly illegal, companies have on occasion falsified transactions in order to improve their reported profitability and financial condition.

Academic Research on Earnings Quality and Stock Performance

The following brief review of the academic literature highlights some of the most important factors that form the basis for Gradient’s approach to quantitatively modeling earnings quality and forecasting future stock return performance.

The very first studies to investigate issues related to earnings quality were conducted by G. Peter Wilson of Harvard University (1986, 1987). Wilson’s key conclusions were that operating cash flows and total accruals (i.e., changes in current accruals plus noncurrent accruals) are differentially valued and that both are value relevant. That is, the market appears to react to the disclosure of detailed cash flow and accrual data (value relevance) and that cash flows are more highly valued than accruals (differential valuation). Wilson’s basic findings are also supported by a number of subsequent studies, including Rayburn (1986), Bowen, Burgstahler and Daley (1987), Charitou and Ketz (1990), Livnat and Zarowin (1990), Vickrey (1993), Ali (1994), Pfiesser et al. (1998), and Vickrey, Vickrey and Bettis (2000).

The fact that the market values a dollar of cash flow more than a dollar of current or noncurrent accruals implies that higher levels of accruals are indicative of lower quality of earnings. In other

words, the degree to which a company must rely on accruals to boost net income results in lower quality earnings. Nevertheless, it is possible that the market “sees through” the deception and appropriately values companies based on some notion of baseline or sustainable earnings. However, the first studies to investigate this issue (Sloan, 1996 and Swanson and Vickrey, 1997) find that, contrary to the efficient markets hypothesis, disaggregating earnings into cash flow and accrual components is useful in identifying securities that are likely to outperform (or underperform) in the future. Thus, the results of these studies imply that security prices do not fully reflect the information contained in the cash flow and accrual components of earnings.

Following in the path of Sloan (1996) and Swanson and Vickrey (1997), academic researchers are currently focusing on the development of simple empirical models that objectively assess *earnings quality* in order to predict future return performance. (See, for example, Sloan, Soliman and Tuna, 2001; Chan, Chan, Jegadeesh and Lakonishok, 2001; and Penman and Zang, 2001.) These studies find that companies with relatively high (low) levels of accruals tend to underperform (outperform) for periods of 12-36 months after the disclosure of detailed financial data. Specifically, the studies find that the return spread between stocks with the highest level of accruals (lowest earnings quality) and the lowest level of accruals (highest earnings quality) is as high as 21.7%, depending on the approach used by the authors in forming portfolios. The implication is that measures of earnings quality can be used in forming profitable investing and trading strategies and more effectively managing risk.

The Gradient Approach to Analyzing Earnings Quality

Gradient Analytics takes a balanced, objective approach to the analysis of earnings quality. Our focus on balance and objectivity is designed to achieve the following goals.

- (1) To provide research that is useful in identifying both:
 - a. Stocks with high quality earnings that are, consequently, expected to outperform their peers and the overall market.
 - b. Stocks with low quality earnings that are, consequently, expected to underperform their peers and the overall market.
- (2) To minimize the likelihood that a company will be erroneously categorized as having “low quality earnings”. By considering both positive and negative indicators of earnings quality, it is possible to form more objective conclusions about overall earnings quality.
- (3) To distinguish between companies who are simply smoothing their earnings versus those who are materially misstating their earnings in order to improve the probability of identifying companies that will significantly underperform their peers and the overall market. By considering both positive and negative earnings quality indicators, the probability that research can meaningfully discriminate between these two classes of firms is significantly improved.

- (4) To provide greater coverage using a quantitative approach that allows Gradient to provide an earnings quality rating for 85% of the top 5000 securities ranked by market capitalization.

The Gradient Process

To ensure a balanced, objective approach we employ a two-stage process. In the first stage, our proprietary, quantitative earnings quality model performs an analysis of each of the largest 5000 U.S. companies ranked by market capitalization (the “Top 5000”, for brevity). The quantitative model provides a means of objectively rating each company using all available financial statement information. In the second stage, our team of experienced analysts performs a fundamental-based analysis of earnings quality for selected companies within the Top 5000.

Step 1: The Gradient Earnings Quality Model

The Gradient *Earnings Quality Model* (EQM) is the first quantitative model designed to measure earnings quality across a broad spectrum of companies. The EQM provides a weekly score ranging from 1 (poor quality, with expected underperformance) to 8 (strong quality, with expected out performance) for each of the Top 5000 companies. The EQM score is derived completely objectively – not subjectively – through statistical analysis of accrual and cash flow components of earnings.

The model was constructed using a multiple regression approach that incorporates several important dimensions of earnings quality identified by academic and proprietary research. When considered together, these dimensions or “sub-factors” provide a means of reliably ranking firms according to their expected future return performance.

Table 1 below shows the average raw and excess return for the full distribution of EQM scores over all time periods. As shown in the table, the spread in raw (excess) returns between the top and bottom rated companies is 30.55% (24.28%). Moreover, the overall distribution of returns by score shows that the model is able to reliably and unambiguously forecast expected future returns by ranking stocks according to their level of earnings quality.

Note: Additional information on the Gradient EQM is available in a sister document entitled “Quantitative Analysis of Earnings Quality: The Earnings Quality Model”.

Table 1: Returns by Score
Entire Period: 01/01/1991 – 03/31/2005

Score	Raw Return (%)				Excess Returns (%)			
	1 Month	3 Month	6 Month	12 Month	1 Month	3 Month	6 Month	12 Month
8	2.47%	7.16%	13.02%	27.04%	0.78%	2.26%	4.24%	9.34%
7	2.27%	6.05%	10.75%	22.29%	0.69%	1.69%	2.91%	5.94%
6	2.19%	5.47%	10.30%	20.99%	0.74%	1.29%	2.63%	4.86%
5	1.91%	4.63%	8.32%	16.82%	0.39%	0.47%	0.84%	1.38%
4	1.52%	3.70%	6.79%	14.17%	0.14%	-0.21%	-0.39%	-0.67%
3	1.32%	3.11%	5.16%	10.64%	0.04%	-0.50%	-1.45%	-3.36%
2	0.76%	1.89%	2.57%	6.27%	-0.45%	-1.59%	-3.67%	-6.79%
1	-0.37%	-0.50%	-1.86%	-3.51%	-1.25%	-3.47%	-7.25%	-14.94%

Raw returns are computed using compounded, dividend inclusive returns. Excess returns are calculated for each score by subtracting the equally weighted mean average return for the appropriate size category (large, mid, small, or micro) from the raw return for the related security.

Step 2: Fundamental-Based Analysis of Earnings Quality

In step 2, Gradient's team of analysts performs a detailed review of select companies using all publicly available financial reports, including the annual report to shareholders, the 10-K, the 10-Q, and the Proxy Statement. Using ratios and other tools of fundamental analysis the analysts look for evidence of poor quality earnings. The following sub-sections provide a high level overview of some of the more important factors that Gradient's analysts consider in assessing a company's quality of earnings.

Cash Flow Generation

One of the most important indicators of earnings quality is the level cash flow generated by the company. Simply stated, while it is possible to fabricate or manipulate earnings, it is not possible to misstate cash flow. One way of understanding the importance of cash flow is to decompose net income into cash flow and accrual components as shown below:

$$\text{Net Income} = \text{Operating Cash Flow} + \text{Total Accruals}$$

As discussed above, academic research shows that earnings quality (and future return performance) is related to the level of accruals reflected in income. Since cash flow is the compliment of accruals, operating cash flow (as reported on the cash flow statement) is an excellent indicator of earnings quality. When examining cash flow, some of the more important measures our analysts consider are the:

- Level and trend in operating cash flow relative to operating income
- Level and trend in free cash flow relative to net income

Quality of Accounts Receivable

Analyzing the quality of a company's accounts receivable and revenues provides insight into one of the major determinants of earnings quality – the quality of revenues. In general, more conservative revenue recognition leads to higher quality earnings, while more aggressive revenue recognition leads to lower quality earnings. Some of the more important items that we examine in assessing the quality of receivables include the:

- Level and change in receivables in relation to sales
- Level and change in the provision for bad debts
- Level and change in the provision for sales returns
- Method of estimating bad debts and how it can impact reported profits
- Company's stated method(s) for recognizing revenue in relation to others in its industry

Quality of Inventories

The quality of a company's inventories is directly related to the conservatism and objectivity inherent in its computation of cost of goods sold. Specifically, if a company's cost of goods sold is understated then profitability will be overstated (and vice versa). When examining the quality of inventories, some of the most important items that we examine include the:

- Level and change in total inventory in relation to sales
- Trend in gross margin
- Inventory method and how it can impact reported profits
- Relationship between various types of inventory accounts, such as raw materials, work-in-process, and finished goods
- Company's stated method(s) for inventory accounting in relation to others in its industry

Quality of Long-Term Asset Accounts

The conservatism and objectivity inherent in a company's long-term asset accounts can also significantly impact reported profits. For example, lengthening the depreciation period for long-term assets can increase the bottom line without actually improving the true profitability of the company. When examining the quality of long-term assets, some of the more important areas that we investigate are:

- The adequacy of depreciation and amortization charges
- Changes in depreciation or amortization methods
- Evidence of impaired asset values
- The age of the company's long-term assets
- Capacity utilization

Quality of Liability Accounts and Disclosures

The quality of liability accounts is also crucial to understanding overall earnings quality. Specifically, liabilities must be reported objectively and in an unbiased fashion - or earnings quality will suffer. In assessing the quality of liabilities, some of the more important issues that we address are:

- The assumptions used in accruing various liabilities
- Loans to related parties
- Signs of off-balance sheet financing and management's detailed disclosures related to liabilities that are not accrued (i.e., do not show up in the financial statements)
- The extent and nature of derivatives use
- Policies with regard to capitalization of costs
- Signs of pending litigation

The Magnitude and Materiality of Earnings Management Activities

As discussed above, the vast majority of companies employ at least some earnings management techniques in order to facilitate management's financial reporting goals. In this regard, it is extremely important to assess the magnitude (absolute size) and materiality (size relative to net income and total assets) of earnings management activities. When assessing the materiality of earnings management activities, some of the more important areas that we investigate are:

- Changes in the relationship between earned vs. unearned revenues
- Whether revenues or expenses appear to be recorded in the correct period
- The frequency and timing of share buybacks (that might boost earnings per share)
- The use of non-core income to boost income from operations (e.g., pension-related income, certain nonrecurring items, and items that may be misclassified on the income statement)
- The shifting of costs to other areas on the income statement to boost operating income (and/or gross margin)
- The timing and magnitude of large asset write-downs

Corporate Governance and Control Structure

The company's corporate governance and control structure (CGCS) refers to the various checks and balances that exist within the company in order to ensure that management acts in the best interests of its shareholders. In this regard, material earnings management and fraudulent accounting are only possible when the CGCS is ineffective. When the effectiveness of the CGCS, some of the more important issues that our analysts examine include:

- The composition and experience of the board (and especially its audit committee)
- The audit firm and audit opinion
- The experience and tenure of the CFO, controller and accounting staff
- Option and bonus plan parameters (including any re-pricings)
- Signs of excessive perks/compensation for executives
- Signs of shareholder discontent
- Signs of poor internal controls

Competitive Environment

The environment in which the company operates also has the potential to impact earnings quality either positively or negatively. For example, rapid technological change in the computer hardware industry can quickly lead to a buildup of obsolete or impaired inventory. In contrast,

technological change impacts the manufacturing sector much more slowly and is therefore much less of a factor in assessing earnings quality for manufacturing firms. Similarly, companies in high-growth industries tend to be more susceptible to material earnings quality problems relative to companies in more stable-growth industries. The more important issues to consider with regard to the competitive environment include:

- The competitive state of the industry
- Economic conditions
- Rapid changes in technology that may impact the company's products
- The regulatory environment (including any special requirements and any adverse regulatory actions)

Other Company Specific Factors

Finally, there are a variety of company-specific factors that can also impact earnings quality. The following list provides high level view of a few of the more important company-specific issues that our analysts consider when assessing earnings quality:

- The complexity of transactions and account valuations
- The breadth and depth of the company's customer base
- The level and change in legal expenses
- The company's debt rating
- The nature of any debt covenants
- Liquidity and solvency measures
- The existence of related party transactions
- The timing of the issuance of financial statements
- The growth rate of the company

Conclusion

Earnings quality analysis has long been regarded as the portfolio manager's best defense against low quality financial reporting. And, although earnings quality analysis has traditionally focused only on identifying companies with low quality earnings, the latest academic research also demonstrates the value of earnings quality analysis in forecasting future return performance for stocks with high quality earnings.

Gradient Analytics' *Earnings Quality Analytics* is the first service of its kind to provide a balanced approach to earnings quality analysis – allowing you to identify stocks that are likely to outperform (due to high earnings quality) as well as stocks those that are likely to under-perform (due to low earnings quality). *Earnings Quality Analytics* systematically analyzes earnings quality for the top 5,000 securities (ranked by market capitalization) using our proprietary Earnings Quality Model. The findings of the Earnings Quality Model are also supported by traditional fundamental-based, earnings quality analysis performed by a team of highly experienced analysts. The end product is a highly unique research service that can help you to generate higher returns and more effectively manage risk.

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