White Paper

Quantitative Analysis of Earnings Quality: The Earnings Quality Factor Model

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Introduction

Earnings quality analysis has long been known as the qualitative investment manager's best defense against low quality financial reporting. While not widely known, recent academic and proprietary research shows that earnings quality metrics are also useful in generating alpha in the context of quantitative investment and trading strategies.

The Gradient Analytics *Earnings Quality Model* (EQM) is the first quantitative factor that objectively measures earnings quality across a broad spectrum of companies for both longer-term (3-12 month) and shorter-term (1-3 month) holding periods. The model was developed using rigorous statistical methods to ensure a robust factor that generates excess returns on a standalone basis while also capturing a unique dimension of returns not captured by other quantitative factors. The end product is a highly unique factor with exceptional returns and low correlation in relation to other commonly used factors such as those derived from estimate revisions, earnings momentum, price momentum, cash flow, corporate insider, growth and value.

Overview of Earnings Quality

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: conservatism[2] and objectivity[3]. However, in reality these two guiding principles are often stretched to the limit or ignored.

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 working within the

[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.

bounds of GAAP use minor accounting "gimmicks" to present financial results in a particular light (i.e., overstate or understate their true profitability or financial condition).[4] *MicroStrategy, Inc.*, for example, (1999-2000) was using an aggressive revenue recognition policy that, while not in violation of GAAP, tended to overstate the company's true profitability. However, 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 access to earnings quality analysis – qualitative or quantitative – would have 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.

While MicroStrategy's treatment of contract revenues was very aggressive, arguably it was operating in a gray area of GAAP. In more extreme cases, however, some companies go so far as to commit fraudulent acts that materially misstate their financial statements in ways that do not conform to GAAP. For example, 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, while intentional manipulation of accounting numbers is common, earnings quality problems are not always the 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 illegal) and/or fraudulent means. The list presented below provides a high level overview of how management can manipulate accounting numbers.

1. Recording fictitious transactions or amounts
2. Recording transactions incorrectly
3. Recording transactions early

[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).

4. Recording transactions late
5. Misstating percentages or amounts involved in a transaction
6. Misstating the amounts of assets or liabilities
7. Changing accounting methods or estimates for no substantive reason
8. Using related party transactions to alter reported profits

Academic Research on Earnings Quality and Future Returns

In addition to the anecdotal evidence provided by qualitative earnings quality services (i.e., those that use subjective evaluations of financial statements to render an earnings quality grade), academic research also supports the notion that quantitative models of earnings quality can be used to earn excess returns. 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 related excess returns.

The very first studies to investigate issues related to earnings quality were conducted by G. Peter Wilson of Harvard University (1986, 1987) using an event study methodology.[6] Wilson's key conclusions are 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 studies that use an association methodology[7], including Rayburn (1986), Bowen, Burgstahler and Daley (1987), Charitou and Ketz (1990), Livnat and Zarowin (1990), Vickrey (1993), Ali (1994), Pfieffer 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 under-perform) 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

[6] Event studies generally use relatively short return windows to measure the association between returns and the independent variable of interest. For example, Wilson (1986, 1987) measures the association between stock returns and accrual components of earnings around the release of the annual report.

[7] In contrast to event studies, association studies generally use relatively long return windows to gauge the association between contemporaneous returns and the variable of interest. In the context of earnings-related studies, this implies that returns are measured over a long interval during which information about earnings is gradually released to the market place – for example, during the 12 month period t-8 to t+4 where t represents the last month of the company's fiscal year.

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.) Table 1 below summarizes the results of recent academic working papers that focus on the predictive ability of simple earnings quality models. As shown in the table, these studies find that companies with relatively high (low) levels of accruals tend to under-perform (outperform) for periods of 12-36 months after the disclosure of detailed financial data. Specifically, the return spread between stocks with the highest level of accruals (lowest earnings quality) and the lowest level of accruals (highest earnings quality) ranges from 8.8% to 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.

Table 1: Results of Academic Research on the Relationship Between Earnings Quality and Future Returns

Study	Major Findings
Richardson, Sloan, Soliman and Tuna (2001)	• Higher (lower) levels of accruals are associated with lower (higher) future returns. • When firms are placed in deciles based on the level of total accruals, firms in the top decile (highest level of accruals) return 5.9% in the ensuing twelve months while firms in the bottom decile (lowest level of accruals) return +27.6%. Sample period: 1988 to 1998. • Given their approach to operationalizing accruals variables, they find no benefit to disaggregating current and noncurrent accruals.
Chan, Chan, Jegadeesh and Lakonishok (2001)	• Earnings increases accompanied by high (low) levels of accruals (suggesting low quality earnings) are associated with poor (strong) future returns. • When firms are placed in deciles based on the level of total accruals, firms in the top decile (highest level of accruals) return 9.0% in the ensuing twelve months while firms in the bottom decile (lowest level of accruals) return +17.8%. Moreover, the return differential between deciles 1 and 10 persists for at least 36 months. Sample period: 1971 to 1995. • There is some evidence that individual accrual accounts provide incremental information over aggregated total accruals.
Penman and Zhang (2001)	• Higher (lower) levels of the Q-score (high Q-score implies high earnings quality) are associated with higher (lower) returns. • When firms are placed in deciles based on the value of the Q-score, firms in the lowest decile (worst earnings quality) return 17.0% in the ensuing twelve months while firms in the top decile (best earnings quality) return +26.1%. Sample period: 1976 to 1995. • There is some evidence that individual accrual accounts provide incremental information over aggregated total accruals. • It should be noted that Penman and Zhang's Q-score measure actually under-performs simple measures of standardized total accruals. This is due to the fact that the authors only consider three accrual accounts in constructing their Q-score. While this is an obvious limitation in the context of predicting excess returns, the goal of their paper is broader than the prediction of excess returns.

Gradient Analytics' Earnings Quality Model

The latest academic research demonstrates that the market does not fully impound information about earnings quality at the time that detailed financial statement data are released. That is, a statistically-based approach to analyzing earnings quality can yield profitable investment and trading strategies. Thus, the next step was to develop a robust model that is designed to optimize the excess returns that can be realized from an earnings quality strategy. The Gradient Analytics *Earnings Quality Model* (EQM) has been developed to achieve this goal.

The Gradient EQM is the first quantitative factor that measures earnings quality across a broad spectrum of companies. The EQM provides two weekly scores ranging from 1 (strong sell) to 8 (strong buy) for each of the top 5000 companies ranked by market capitalization. The ***Long-Term Score*** provides a 1-8 ranking based on a stock's expected future performance over a 3-12 month holding period. The ***Short-Term Score*** ranks each stock based on its expected future performance over a 1-3 month holding period.

In contrast to competing, commercially-available earnings quality services, the output from the EQM is derived objectively – not subjectively – through statistical analysis of accrual and cash flow components of earnings. The model was developed using rigorous statistical methods to ensure a robust factor that generates excess returns on a standalone basis while also capturing a unique dimension of returns not captured by other quantitative factors. More specifically, the model was constructed using a multiple regression approach (including regressors from academic research and our own theoretically sound proprietary earnings quality constructs) estimated in pooled time series, cross section for 13 sector categories.[8] Each separate sector model incorporates the most important dimensions of earnings quality for that segment of the market.[9] When considered together, these dimensions or "sub-factors" provide a means of reliably ranking firms monotonically according to both their expected mean and median excess returns. The end product is a highly unique factor with exceptional returns and low correlation in relation to other commonly used factors.

All Gradient models are developed using a disciplined scientific approach. Our approach can be characterized as follows:

Variable Specification - We begin by carefully specifying each variable to ensure proper measurement and scaling. When more than one specification is defensible, we choose the simplest specification on the theory that simplicity will yield more generalizable results.

Modeling Techniques – Each model is estimated using relatively simple linear and nonlinear regression techniques. Again, we believe that simplicity is the key to generalizability.

[8] To maximize observations, each sector has more than one model specification. One model is based on the finest partition of the cash flow and accrual data (if available). The second model uses a slightly coarser specification of the cash flow and accrual variables.

[9] For example, the quality of inventories and accounts payable are two of the more important dimensions of earnings quality for retail firms. However, they are not important dimensions of earnings quality for consumer services firms.

Sensitivity Analyses – All models are subjected to sensitivity analyses to determine whether or not our results are impacted by outliers, changes in regimes, alternative variable specifications and modeling techniques, and so on.

Proper Use of In-Sample and Out-of-Sample Periods – Each model is estimated using data from a strict in-sample period. The model is then tested (for generalizabity, stability, and so on) in an out-of-sample period.

Control for Potential Threats to Internal and External Validity – Our research efforts are designs to control for common threats to internal and external validity in financial engineering studies (such as survivorship bias, hindsight bias, selection bias, and so on).

Performance of the Model

The Gradient EQM has been extensively back-tested across a variety of stock universes and time periods in order to ensure optimal, generalizable results. The results presented in this section provide extremely strong evidence on the usefulness of the EQM.

All back-testing for the EQM utilized Gradient's robust, proprietary and commercially available Event Study Performance (ESP) system and the Portfolio Performance Measurement (PPM) system.

Results Summary – Long-Term Model

The first section of the attached Appendix provides results for the Long-Term EQM (i.e., the model optimized for holding periods of 3-12 months). As shown in the Appendix, the model produces highly significant excess returns, performs extremely well both in- and out-of-sample, and has a low correlation with other commonly used quantitative factors. In summary, the results demonstrate the following:

1. Table 1 of the Appendix shows the average raw and excess return for the full distribution of Long-Term Scores over all time periods. As shown in the table, ***the spread in 12-month raw (excess) returns between the top and bottom rated companies is 30.55% (24.28%) and the distribution of returns for each level of the score is monotonic decreasing.*** This result implies that the Long-Term EQM is able to reliably and unambiguously forecast expected future returns over longer holding periods by ranking stocks according to their level of earnings quality.

2. Tables 2 and 3 show the performance of the Long-Term EQM in- and out-of-sample. As shown in these tables, ***the Long-Term EQM performs equally well both in- and out-of-sample.*** Thus, the model's results are generalizable outside of the modeling period. Note that the 12-month raw (excess) return spread between the top and bottom rated stocks ranges from 32.16% (26.74%) in-sample to 28.36% (21.12%) out-of-sample. Similarly, the monotonic nature of the returns to each score remains consistent across the in- and out-of-sample periods.

3. Tables 4-7 show the performance of the Long-Term Model across different capitalization ranges. As shown in these tables, ***the Long-Term EQM performs very well for large, medium, small and micro capitalization stocks.*** In this regard, the model's results are robust to differences in firm size and the related information environments. Note that the 12-month raw (excess) return spread between the top and bottom rated stocks ranges from 17.50% (8.42%) for large capitalization stocks to 38.42% (29.79%) for micro capitalization stocks. Moreover, the monotonic nature of the returns to each Long-Term Score remains consistent across all capitalization ranges.

4. Table 8 provides a nonparametric count of winners (stocks that go up) and losers (stocks that go down). As shown in Table 8, ***65.23% of all stocks rated 8 increase in price over the ensuing 12 months while only 41.12% of all stocks rated 1 generate positive returns over the next one-year period.***

5. Table 9 provides information about the standard deviation of returns determined in pooled cross section, time series for each score category. As shown the table, each score category has a ***relatively low standard deviation of returns.*** In this regard, the consistency of returns within each Long-Term Score category is exceptionally high relative to other quantitative factors.

6. As shown in Table 10, ***the Long-Term EQM has extremely low correlation with other common factors***, such as insider, analyst revision, earnings surprise, predicted earnings surprise, momentum, valuation and growth. In this regard, the Long-Term Scores provide information on a unique dimension of returns not captured by other common quantitative factors.

7. Table 11 shows the model's coverage (number of companies with an active Long-Term Score in each weekly file) for each year during the entire sample period. As shown in the table, coverage has ranged from approximately 70-80% over the sample period. Moreover, ***coverage has remained at approximately 80% since 1995.***

8. Tables 12 and 13 show the frequency distribution of Long-Term Scores over the entire sample period. As shown in these tables, the distribution is approximately normal, with a "fatter tail" in the area of positive earnings quality.

9. Finally, Table 14 demonstrates that ***the Long-Term EQM performs exceptionally well - and related results are extremely consistent - in all sample years.***

Results Summary – Short-Term Model

The Appendix also contains performance results for scores produced by the Short-Term EQM (i.e., the model intended for 1-3 month holding periods). As shown in the Appendix, the Short-Term Model also produces highly significant excess returns, performs extremely well both in- and out-of-sample, and has a low correlation with other commonly used quantitative factors. In summary, the results demonstrate the following:

1. Table 15 shows the average raw and excess return for the full distribution of Short-Term EQM scores over all time periods. As shown in the table, ***the spread in 3-month raw (excess) returns between the top and bottom rated companies is 6.93% (5.31%) and the***

distribution of returns for each level of the score is monotonic decreasing. Thus, the model is able to reliably and unambiguously forecast expected future returns over shorter holding periods by ranking stocks according to their level of earnings quality.

2. Tables 16 and 17 show that ***the Short-Term EQM performs equally well both in- and out-of-sample.*** Thus, the model's results are generalizable outside of the modeling period. Note that the 3-month raw (excess) return spread between the top and bottom rated stocks ranges from 6.82% (5.63%) in-sample to 6.52% (4.98%) out-of-sample. Similarly, the monotonic nature of the returns to each score remains consistent across the in- and out-of-sample periods.

3. Tables 18-21 show the performance of the Short-Term EQM across different capitalization ranges. As shown in these tables, ***the Short-Term EQM performs very well for large, medium, small and micro capitalization stocks.*** In this regard, note that the 3-month raw (excess) return spread between the top and bottom rated stocks ranges from 3.86% (2.08%) for large capitalization stocks to 9.23% (6.87%) for micro capitalization stocks. Moreover, the monotonic nature of the returns to each score remains consistent across all capitalization ranges.

4. Table 22 provides a nonparametric count of winners (stocks that go up) and losers (stocks that go down). As shown in Table 22, ***58.02% of all stocks rated 8 increase in price over the ensuing 12 months while only 46.96% of all stocks rated 1 generate positive returns over the next one-year period.***

5. Table 23 shows that each score category has a ***relatively low standard deviation of returns*** relative to other quantitative factors.

6. As shown in Table 24, ***the Short-Term EQM has extremely low correlation with other common factors***, such as insider, analyst revision, earnings surprise, predicted earnings surprise, momentum, valuation and growth. Thus, the Short-Term Scores also provides information on a unique dimension of returns not captured by other common factors.

7. Table 25 shows the Short-Term model's coverage (number of companies with an active score in each weekly file) for each year during the entire sample period. As shown in the table, the model's coverage has ranged from approximately 60-70% over the sample period. Moreover, ***coverage has remained at approximately 70% since 1995.***

8. Tables 26 and 27 show the frequency distribution for the distribution of Short-Term scores over the entire sample period. As shown in these tables, the distribution is approximately normal.

9. Finally, Table 28 demonstrates that ***the Short-Term EQM's results are extremely consistent in all sample years.***

Conclusion

Earnings quality analysis is often regarded as the qualitative investment manager's best defense against low quality financial reporting. The latest academic research also demonstrates that the market does not fully impound information about earnings quality at the time that detailed

financial statement data are released. That is, a statistically-based approach to analyzing earnings quality can yield profitable investment and trading strategies. The Gradient Earnings Quality Model (EQM) has been developed to achieve this goal.

The EQM is the first quantitative factor that objectively measures earnings quality for the purpose of forecasting future returns. The model was developed using rigorous statistical methods to ensure a robust factor that generates excess returns on a standalone basis while also capturing a unique dimension of returns not captured by other quantitative factors. The end product is a highly unique factor with exceptional returns and low correlation with other commonly used factors.

The Earnings Quality Model has been extensively back-tested across a variety of stock universes and time periods in order to ensure optimal, generalizable results. The results presented in this white paper provide extremely strong evidence on the usefulness of the EQM. As shown in the results section of this document, the model produces highly significant excess returns, performs extremely well both in- and out-of-sample, and has a low correlation with other commonly used quantitative factors. And, in contrast to competing, commercially-available earnings quality services, the output from the EQM is derived objectively – not subjectively – through statistical analysis of accrual and cash flow components of earnings.

Bibliography

Ali, A. 1994. "The Incremental Information Content of Earnings, Working Capital from Operations, and Cash Flows," *Journal of Accounting Research* 32:61-74.

Bowen, R, D. Burgstahler, and L. Daley. 1987. "The Incremental Information Content of Accrual Versus Cash Flow," *The Accounting Review* 62:723-47.

Chan, K., L. Chan, N. Jegadeesh and J. Lakonishok. 2001. "Earnings Quality and Stock Returns," *Working Paper*. National Bureau of Economic Research.

Charitou, A. and J. Ketz. 1990. "Valuation of Earnings, Cash Flows and Their Components: An Empirical Investigation," *Journal of Accounting, Auditing, and Finance* 5:475-497.

Jennings, R. 1990. A Note on Interpreting Incremental Information Content," *The Accounting Review* 65:925-32.

Livnat, J. and P. Zarowin. 1990. "The Incremental Information Content of Cash-Flow Components," *Journal of Accounting and Economics* 12:25-46.

Penman, S. and X. Zhang. 2001. "Accounting Conservatism, the Quality of Earnings, and Stock Returns," *Working Paper*. Columbia University.

Pfeiffer, R., P. Elgers, M. Lo, and L. Rees. 1998. "Additional Evidence on the Incremental Information Content of Cash Flows and Accruals: The Impact of Errors in Measuring Market Expectations," *Accounting Review* 73:373-385.

Rayburn, J. 1986. "The Association of Operating Cash Flows and Accruals with Security Returns," *Journal of Accounting Research* 24:112-33.

Richardson, S, R. Sloan, M. Soliman and I. Tuna. 2001. "Information in Accruals About the Quality of Earnings," *Working Paper*. University of Michigan.

Sloan, R. 1996. "Do Stock Prices Fully Reflect Information in Accruals and Cash Flows About Future Earnings?," *The Accounting Review* 71:289-316.

Swanson , Z. and D. Vickrey. 1997. "Small Firm Information Releases, Cash Positions, and Security Price Reactions," *Journal of Financial Statement Analysis* 2 (No. 3): 50-66.

Vickrey, D. 1993. "The Incremental Information Provided by Disclosing Cash Flow and Accrual Components of Earnings," *Unpublished Ph.D. Dissertation*. Oklahoma State University.

Vickrey, D., D. Vickrey and C. Bettis. 2000. "The Incremental Information Content of Operating Cash Flows and Accruals," *Journal of Accounting and Finance Research* 8 (No. 2): 27-36.

Wilson, G. 1986. The relative information content of accruals and cash flows. *Journal of Accounting Research* 24. Supplement (1986): 165-200.

_____, 1987. The incremental information content of the accrual and funds components of earnings after controlling for earnings. *The Accounting Review* 62 (1987): 293-322.

Appendix
Earnings Quality Model – Performance Summary

Long-Term Score

This section of the document contains results pertaining to the performance of the long-term EQM score. While we present results for the one-month time frame, we emphasize that long-term scores are intended for holding periods greater than three months. For holding periods less than three months, we recommend using short-term EQM scores. (See section two of this document for results pertaining to short-term EQ scores.)

Table 1: Returns by Score - Full Sample 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 return for the appropriate size category (large, mid, small, or micro) from the raw return for the related security.

Table 2: Returns by Score – In-Sample Period
(01/01/1991 – 06/30/1998 and 07/01/1999 – 06/30/2000)

Score	Raw Return (%)				Excess Returns (%)			
	1 Month	*3 Month*	*6 Month*	*12 Month*	*1 Month*	*3 Month*	*6 Month*	*12 Month*
8	2.69%	7.94%	13.74%	27.37%	0.59%	2.35%	4.49%	9.94%
7	2.55%	6.50%	10.92%	22.15%	0.60%	1.66%	2.80%	6.36%
6	2.61%	6.04%	10.87%	21.58%	0.66%	1.26%	2.84%	6.15%
5	2.24%	5.17%	8.78%	17.41%	0.20%	0.34%	0.75%	2.13%
4	1.98%	4.26%	7.07%	13.63%	-0.02%	-0.46%	-0.69%	-0.99%
3	1.85%	3.81%	5.31%	10.44%	-0.03%	-0.58%	-1.85%	-3.25%
2	1.73%	2.81%	2.63%	5.66%	-0.17%	-1.59%	-4.40%	-7.52%
1	0.50%	0.17%	-1.57%	-4.79%	-1.10%	-3.74%	-7.95%	-16.53%

Table 3: Returns by Score – Out-of-Sample Period
(07/01/1998 – 06/30/1999 and 07/01/2000 – 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	2.05%	5.59%	11.51%	26.26%	1.16%	2.09%	3.73%	7.91%
7	1.78%	5.22%	10.42%	22.60%	0.85%	1.75%	3.12%	5.05%
6	1.52%	4.54%	9.32%	19.87%	0.88%	1.35%	2.28%	2.40%
5	1.42%	3.81%	7.59%	15.74%	0.68%	0.66%	0.99%	0.01%
4	0.94%	2.99%	6.43%	14.98%	0.33%	0.12%	0.02%	-0.19%
3	0.72%	2.32%	4.97%	10.91%	0.12%	-0.41%	-0.98%	-3.52%
2	-0.23%	0.92%	2.50%	7.03%	-0.73%	-1.60%	-2.87%	-5.90%
1	-1.17%	-1.13%	-2.15%	-2.10%	-1.38%	-3.21%	-6.56%	-13.21%

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

Table 4: Returns by Score – Large Capitalization Stocks (Top 400 ranked by market capitalization, 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	2.53%	4.62%	8.59%	16.95%	0.71%	0.58%	1.15%	1.97%
7	1.94%	3.83%	7.33%	15.69%	0.33%	0.33%	0.66%	2.11%
6	1.97%	3.68%	6.74%	15.12%	0.42%	0.06%	-0.09%	1.28%
5	1.65%	3.22%	6.28%	13.03%	-0.02%	-0.40%	-0.42%	-0.31%
4	1.51%	2.90%	5.82%	12.52%	0.07%	-0.19%	0.06%	0.85%
3	1.73%	2.93%	4.98%	9.76%	0.52%	0.14%	-0.08%	0.20%
2	1.23%	2.90%	4.68%	7.65%	0.13%	0.28%	-0.18%	-2.37%
1	0.76%	0.61%	1.89%	-0.55%	-0.26%	-1.44%	-1.48%	-6.46%

Table 5: Returns by Score – Mid Capitalization Stocks (Stocks 401-900 ranked by market capitalization, 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	2.66%	5.85%	10.76%	21.93%	0.85%	1.67%	3.13%	7.12%
7	1.97%	4.68%	8.23%	17.39%	0.37%	0.96%	1.50%	3.31%
6	1.73%	4.12%	8.04%	16.53%	0.22%	0.40%	1.16%	2.23%
5	1.81%	3.89%	6.82%	13.85%	0.18%	0.15%	-0.09%	-0.22%
4	1.79%	3.55%	6.22%	13.10%	0.08%	-0.18%	-0.46%	-0.48%
3	1.45%	2.95%	5.19%	11.21%	-0.08%	-0.47%	-0.98%	-1.76%
2	1.19%	2.38%	3.90%	8.95%	-0.13%	-0.74%	-1.71%	-2.38%
1	0.01%	0.20%	-0.08%	-0.54%	-1.03%	-2.53%	-4.92%	-10.82%

In the tables above, raw returns are computed using compounded, dividend inclusive returns. Excess returns are calculated for each score by subtracting the equally weighted mean return for the appropriate size category (large, mid, small, or micro) from the raw return for the related security. Large capitalization stocks are defined as the largest 400 U.S. traded stocks ranked by market capitalization. Mid capitalization stocks are defined as the next largest 500 stocks by market capitalization. Small and micro capitalization stocks are defined as the next 2,100 and 2,000 companies, respectively.

Table 6: Returns by Score – Small Capitalization Stocks
(Stocks 901-3000 ranked by market capitalization, 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	2.60%	7.24%	13.01%	26.51%	0.81%	2.48%	4.64%	9.82%
7	2.38%	5.91%	10.17%	21.00%	0.70%	1.68%	2.80%	5.87%
6	2.29%	5.40%	9.78%	19.51%	0.74%	1.22%	2.41%	4.14%
5	2.08%	4.88%	8.43%	16.35%	0.49%	0.66%	1.08%	1.42%
4	1.65%	3.84%	6.65%	13.58%	0.22%	-0.11%	-0.43%	-0.87%
3	1.40%	2.91%	4.70%	9.43%	0.01%	-0.84%	-1.88%	-4.22%
2	0.84%	1.96%	2.30%	5.01%	-0.52%	-1.67%	-4.06%	-8.07%
1	-0.26%	-0.75%	-2.98%	-5.14%	-1.34%	-4.00%	-8.62%	-17.06%

Table 7: Returns by Score – Micro Capitalization Stocks
(Stocks 3001-5000 ranked by market capitalization, 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	2.09%	8.57%	15.78%	34.42%	0.68%	2.67%	5.03%	11.84%
7	2.37%	7.97%	14.85%	30.78%	1.01%	2.63%	4.83%	9.24%
6	2.42%	7.15%	14.03%	29.33%	1.25%	2.46%	4.96%	9.47%
5	1.75%	5.31%	10.28%	22.26%	0.55%	0.68%	1.69%	3.51%
4	1.01%	3.80%	7.95%	17.06%	0.04%	-0.43%	-0.36%	-0.91%
3	0.94%	3.71%	6.11%	12.85%	0.09%	-0.04%	-1.38%	-4.08%
2	0.05%	1.00%	1.30%	5.94%	-0.74%	-2.76%	-5.69%	-9.65%
1	-1.41%	-1.08%	-2.80%	-4.00%	-1.67%	-4.05%	-8.97%	-17.95%

In the tables above, raw returns are computed using compounded, dividend inclusive returns. Excess returns are calculated for each score by subtracting the equally weighted mean return for the appropriate size category (large, mid, small, or micro) from the raw return for the related security. Large capitalization stocks are defined as the largest 400 U.S. traded stocks ranked by market capitalization. Mid capitalization stocks are defined as the next largest 500 stocks by market capitalization. Small and micro capitalization stocks are defined as the next 2,100 and 2,000 companies, respectively.

Table 8: Nonparametric Analysis of Winners and Losers
(01/01/1991 – 03/31/2005)

Score	12 Mo Raw Return	
	Winners	***Losers***
8	65.23%	34.77%
7	63.55%	36.45%
6	62.93%	37.07%
5	59.12%	40.88%
4	56.35%	43.65%
3	53.50%	46.50%
2	48.94%	51.06%
1	41.12%	58.88%

Table 9: Standard Deviation of Raw Returns By Score
(01/01/1991 – 03/31/2005)

Score	Raw Return (%)			
	1 Month	***3 Month***	***6 Month***	***12 Month***
8	14.57%	26.67%	39.87%	66.58%
7	13.63%	24.73%	36.84%	60.94%
6	13.37%	24.31%	36.61%	59.96%
5	13.60%	24.65%	36.62%	58.93%
4	14.37%	25.64%	38.27%	61.71%
3	15.19%	27.43%	40.26%	62.85%
2	16.36%	28.91%	41.75%	65.92%
1	17.72%	30.67%	44.61%	66.57%

In the table above, raw returns are computed using compounded, dividend inclusive returns.

Table 10: Correlation with Other Common Factors (01/01/1991 – 03/31/2005)

Factor	*Pearson Correlation Coefficient*
Insider Factor	0.036
Analyst Revision Factor	0.037
Earnings Surprise Factor	0.047
Predicted Earnings Surprise Factor	(0.003)
Momentum Factor	0.048
Valuation Factor	0.044
Growth Factor	(0.117)

Table 11: Coverage* by Year (01/01/1991 – 03/31/2005)

*Coverage refers to the number of companies with an active (non -88) score.

Year	Active Scores	Pct. Active Scores	Inactive Scores	Pct. Inactive Scores
1991	190,273	70.7%	78,983	29.3%
1992	194,055	72.3%	74,421	27.7%
1993	201,985	73.7%	72,184	26.3%
1994	209,979	77.6%	60,785	22.4%
1995	220,253	80.7%	52,643	19.3%
1996	221,681	81.0%	51,943	19.0%
1997	222,380	80.7%	53,168	19.3%
1998	220,912	79.9%	55,520	20.1%
1999	229,491	81.3%	52,681	18.7%
2000	223,407	80.5%	54,273	19.5%
2001	227,500	81.1%	53,144	18.9%
2002	225,588	79.3%	58,874	20.7%
2003	225,535	78.7%	61,125	21.3%
2004	247,252	84.6%	45,047	15.4%
2005	55,940	86.3%	8,872	13.7%

Table 12: Frequency Distribution of Scores
(01/01/1991 – 03/31/2005)

Score	Frequency	Frequency By Week	% of All Scores
8	356,948	480	11.4%
7	311,567	419	9.9%
6	414,285	558	13.2%
5	777,912	1047	24.8%
4	465,410	626	14.9%
3	374,340	504	12.0%
2	241,769	325	7.7%
1	190,138	256	6.1%

Table 13: Percentage Distribution of Scores by Sector
(01/01/1991 – 03/31/2005)

Score	Financials	Healthcare	Cons. Non-Durables	Cons. Service	Cons. Durables	Energy	Transpor-tation	Tech-nology	Basic Industry	Capital Goods	Utilities
8	7.8%	11.5%	10.7%	9.4%	9.3%	6.6%	10.4%	12.2%	8.5%	11.5%	9.3%
7	6.6%	10.1%	9.4%	8.4%	9.3%	7.0%	9.1%	9.8%	8.3%	8.8%	8.0%
6	8.5%	14.1%	11.8%	11.0%	12.5%	9.8%	11.5%	12.4%	11.6%	11.1%	10.6%
5	18.1%	21.1%	22.3%	21.7%	22.2%	21.8%	20.9%	22.0%	22.2%	19.7%	25.8%
4	12.2%	11.5%	12.1%	13.1%	13.1%	13.0%	12.1%	12.4%	13.0%	12.8%	14.1%
3	10.2%	9.5%	9.5%	10.0%	10.3%	11.2%	10.3%	9.5%	10.1%	10.5%	11.6%
2	6.9%	6.2%	5.9%	6.4%	7.2%	6.7%	7.2%	6.0%	5.8%	7.2%	7.0%
1	5.6%	5.8%	4.9%	4.6%	6.4%	4.6%	5.4%	5.0%	3.4%	5.0%	5.8%
-99	24.2%	10.2%	13.3%	15.4%	9.8%	19.4%	13.1%	10.7%	17.1%	13.5%	8.0%

Table 14: Results by Year
(01/01/1991 – 03/31/2005)

Year	Score	1 Mo	3 Mo	6 Mo	12 Mo
1991	**8**	4.6%	15.0%	21.0%	36.2%
1991	**7**	5.6%	14.1%	18.5%	31.4%
1991	**6**	6.0%	14.9%	20.4%	33.9%
1991	**5**	5.2%	12.6%	16.4%	27.3%
1991	**4**	5.8%	14.2%	18.1%	29.0%
1991	**3**	5.4%	14.3%	16.5%	24.5%
1991	**2**	6.1%	14.1%	16.3%	28.2%
1991	**1**	4.9%	12.9%	15.6%	16.5%
1992	**8**	2.0%	5.9%	12.8%	34.2%
1992	**7**	1.8%	5.3%	10.8%	28.4%
1992	**6**	1.8%	4.1%	9.1%	25.4%
1992	**5**	1.1%	2.8%	6.6%	21.1%
1992	**4**	0.7%	1.1%	5.3%	17.7%
1992	**3**	1.1%	2.3%	5.1%	19.5%
1992	**2**	-0.2%	0.6%	0.9%	14.0%
1992	**1**	0.4%	0.0%	2.5%	4.4%
1993	**8**	2.2%	6.4%	10.4%	16.5%
1993	**7**	2.0%	6.6%	11.0%	17.2%
1993	**6**	1.6%	4.8%	8.6%	11.1%
1993	**5**	1.4%	4.9%	7.3%	9.7%
1993	**4**	1.2%	4.3%	6.8%	7.0%
1993	**3**	1.5%	4.8%	8.6%	7.8%
1993	**2**	0.8%	4.4%	3.8%	-2.7%
1993	**1**	0.4%	1.8%	0.9%	-6.2%
1994	**8**	-0.1%	1.4%	5.6%	20.8%
1994	**7**	0.2%	1.6%	4.7%	18.3%
1994	**6**	0.1%	0.5%	4.5%	19.1%
1994	**5**	-0.1%	0.0%	3.0%	17.0%
1994	**4**	-0.4%	-0.3%	2.2%	16.1%
1994	**3**	-0.8%	-1.4%	0.9%	11.3%
1994	**2**	-0.6%	-3.2%	-3.0%	6.4%
1994	**1**	-2.4%	-5.4%	-7.7%	-3.5%

Year	Score	1 Mo	3 Mo	6 Mo	12 Mo
1995	**8**	3.1%	8.2%	17.5%	31.1%
1995	**7**	2.8%	7.7%	15.5%	26.1%
1995	**6**	3.0%	7.5%	16.7%	27.9%
1995	**5**	2.7%	6.6%	15.0%	24.0%
1995	**4**	2.4%	6.0%	14.0%	20.9%
1995	**3**	2.6%	6.3%	13.3%	20.4%
1995	**2**	2.7%	5.2%	11.4%	16.3%
1995	**1**	0.9%	3.9%	9.3%	11.3%
1996	**8**	3.7%	7.8%	11.9%	32.3%
1996	**7**	3.6%	6.6%	9.8%	29.5%
1996	**6**	3.5%	7.1%	9.8%	29.0%
1996	**5**	3.2%	5.8%	7.4%	24.0%
1996	**4**	3.0%	4.4%	3.6%	17.5%
1996	**3**	2.8%	3.9%	2.3%	14.2%
1996	**2**	2.7%	2.3%	-1.2%	6.3%
1996	**1**	1.3%	-1.3%	-8.1%	-4.9%
1997	**8**	3.2%	7.9%	18.8%	21.5%
1997	**7**	2.6%	7.7%	17.1%	18.3%
1997	**6**	3.0%	6.9%	16.6%	18.9%
1997	**5**	2.7%	6.8%	15.8%	15.0%
1997	**4**	2.3%	5.5%	13.8%	11.8%
1997	**3**	1.6%	5.2%	11.3%	6.1%
1997	**2**	1.8%	3.8%	10.1%	5.8%
1997	**1**	0.6%	2.2%	5.2%	-4.6%
1998	**8**	0.6%	1.4%	-1.8%	9.0%
1998	**7**	0.2%	1.0%	-3.2%	6.8%
1998	**6**	-0.5%	-0.1%	-3.2%	2.9%
1998	**5**	-0.4%	-0.5%	-4.2%	0.2%
1998	**4**	-1.0%	-1.3%	-4.9%	-1.1%
1998	**3**	-1.4%	-1.6%	-6.3%	-0.6%
1998	**2**	-2.2%	-2.4%	-6.8%	-3.0%
1998	**1**	-2.7%	-2.8%	-6.8%	-6.8%

Year	Score	1 Mo	3 Mo	6 Mo	12 Mo
1999	**8**	1.6%	7.8%	14.3%	33.8%
1999	**7**	1.1%	4.3%	9.6%	22.1%
1999	**6**	1.2%	5.0%	9.7%	19.4%
1999	**5**	0.9%	4.8%	7.9%	14.6%
1999	**4**	0.8%	4.5%	6.7%	12.7%
1999	**3**	1.0%	4.9%	6.0%	9.7%
1999	**2**	1.2%	7.1%	6.9%	8.5%
1999	**1**	1.3%	5.9%	6.7%	7.4%
2000	**8**	0.9%	5.1%	9.8%	16.6%
2000	**7**	2.4%	5.4%	11.4%	21.7%
2000	**6**	2.0%	4.1%	6.7%	12.7%
2000	**5**	1.2%	3.2%	5.9%	8.9%
2000	**4**	0.3%	0.8%	1.2%	1.6%
2000	**3**	-0.3%	-2.5%	-4.8%	-8.9%
2000	**2**	-1.6%	-4.2%	-9.1%	-14.8%
2000	**1**	-4.0%	-11.8%	-21.9%	-32.7%
2001	**8**	2.6%	6.0%	10.4%	6.9%
2001	**7**	2.4%	5.2%	7.7%	5.5%
2001	**6**	1.8%	4.7%	8.7%	4.6%
2001	**5**	1.7%	3.1%	5.0%	0.7%
2001	**4**	0.7%	1.2%	2.8%	-1.8%
2001	**3**	0.1%	0.2%	0.1%	-5.1%
2001	**2**	-1.5%	-3.6%	-5.8%	-14.0%
2001	**1**	-2.6%	-5.2%	-12.1%	-27.1%
2002	**8**	-0.9%	-4.4%	-4.3%	26.6%
2002	**7**	-1.1%	-4.6%	-4.9%	19.4%
2002	**6**	-1.1%	-4.0%	-4.8%	19.9%
2002	**5**	-1.2%	-4.9%	-6.6%	14.3%
2002	**4**	-1.4%	-5.8%	-7.9%	13.9%
2002	**3**	-1.8%	-6.3%	-6.8%	15.0%
2002	**2**	-2.4%	-7.3%	-8.5%	13.1%
2002	**1**	-3.2%	-6.3%	-8.8%	13.4%

Year	Score	1 Mo	3 Mo	6 Mo	12 Mo
2003	**8**	6.4%	19.6%	35.7%	47.3%
2003	**7**	5.8%	18.3%	32.4%	40.9%
2003	**6**	5.6%	16.4%	30.5%	40.5%
2003	**5**	5.1%	14.6%	25.7%	35.4%
2003	**4**	5.0%	14.5%	25.5%	36.1%
2003	**3**	5.5%	14.7%	24.4%	32.1%
2003	**2**	5.3%	14.5%	24.4%	33.8%
2003	**1**	5.2%	15.8%	26.6%	31.5%
2004	**8**	2.1%	0.9%	3.1%	0.3%
2004	**7**	1.7%	1.9%	5.0%	7.3%
2004	**6**	2.6%	2.7%	6.1%	5.7%
2004	**5**	2.3%	2.3%	6.3%	10.8%
2004	**4**	2.0%	2.1%	6.2%	11.3%
2004	**3**	2.3%	2.7%	7.2%	9.9%
2004	**2**	1.4%	1.6%	5.4%	10.1%
2004	**1**	1.9%	1.4%	5.7%	3.2%
2005	**8**	-1.5%	N/A	N/A	N/A
2005	**7**	0.0%	N/A	N/A	N/A
2005	**6**	-1.2%	N/A	N/A	N/A
2005	**5**	-0.4%	N/A	N/A	N/A
2005	**4**	-1.5%	N/A	N/A	N/A
2005	**3**	-0.6%	N/A	N/A	N/A
2005	**2**	0.4%	N/A	N/A	N/A
2005	**1**	-1.6%	N/A	N/A	N/A

Short-Term Scores

This section of the document contains results pertaining to the performance of the short-term EQM score. For holding periods less than three months, we recommend using short-term EQM scores. (For holding periods greater than three months, see section one of this document for results pertaining to long-term EQ scores.)

Table 15: Returns by Score - Full Sample Period (01/01/1991 – 03/31/2005):

Score	Raw Return (%)		Excess Returns (%)	
	1 Month	*3 Month*	*1 Month*	*3 Month*
8	2.93%	6.40%	0.88%	1.86%
7	2.33%	5.43%	0.46%	1.23%
6	1.94%	5.22%	0.58%	1.24%
5	1.56%	4.05%	0.25%	0.34%
4	0.82%	3.02%	-0.11%	-0.40%
3	0.63%	2.61%	-0.17%	-0.68%
2	0.40%	1.58%	-0.50%	-1.64%
1	-0.50%	-0.53%	-1.31%	-3.45%

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

Table 16: Returns by Score – In-Sample Period
(01/01/1991 – 06/30/1998 and 07/01/1999 – 06/30/2000)

Score	Raw Return (%)		Excess Returns (%)	
	1 Month	*3 Month*	*1 Month*	*3 Month*
8	3.08%	6.83%	1.01%	1.87%
7	2.29%	5.70%	0.51%	1.19%
6	2.17%	5.67%	0.56%	1.29%
5	1.75%	4.46%	0.20%	0.27%
4	1.18%	3.65%	-0.13%	-0.34%
3	1.08%	2.85%	-0.31%	-0.97%
2	1.32%	2.27%	-0.26%	-1.62%
1	0.37%	0.00%	-1.15%	-3.76%

Table 17: Returns by Score – Out-of-Sample Period
(07/01/1998 – 06/30/1999 and 07/01/2000 – 03/31/2005)

Score	Raw Return (%)		Excess Returns (%)	
	1 Month	*3 Month*	*1 Month*	*3 Month*
8	2.61%	5.48%	0.60%	1.82%
7	2.41%	4.94%	0.37%	1.31%
6	1.55%	4.41%	0.60%	1.15%
5	1.29%	3.44%	0.32%	0.44%
4	0.33%	2.15%	-0.10%	-0.48%
3	0.09%	2.33%	-0.01%	-0.31%
2	-0.55%	0.86%	-0.74%	-1.66%
1	-1.29%	-1.03%	-1.45%	-3.16%

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

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Table 18: Returns by Score – Large Capitalization Stocks
(Top 400 ranked by market capitalization, 01/01/1991 – 03/31/2005)

Score	Raw Return (%)		Excess Returns (%)	
	1 Month	*3 Month*	*1 Month*	*3 Month*
8	2.26%	4.26%	0.65%	0.52%
7	1.85%	4.42%	0.13%	0.44%
6	1.71%	3.54%	0.24%	0.05%
5	1.28%	3.18%	0.00%	-0.06%
4	0.68%	2.59%	-0.14%	-0.11%
3	0.32%	2.35%	-0.18%	-0.09%
2	0.07%	2.28%	-0.32%	0.08%
1	0.59%	0.40%	-0.36%	-1.56%

Table 19: Returns by Score – Mid Capitalization Stocks
(Stocks 401-900 ranked by market capitalization, 01/01/1991 – 03/31/2005)

Score	Raw Return (%)		Excess Returns (%)	
	1 Month	*3 Month*	*1 Month*	*3 Month*
8	2.45%	5.41%	0.87%	1.60%
7	2.06%	5.10%	0.30%	1.08%
6	1.71%	4.02%	0.16%	0.32%
5	1.36%	3.63%	0.07%	0.19%
4	0.74%	2.87%	-0.14%	-0.28%
3	0.48%	2.78%	-0.09%	-0.14%
2	0.57%	1.97%	-0.04%	-0.80%
1	-0.05%	0.19%	-0.99%	-2.46%

In the tables above, raw returns are computed using compounded, dividend inclusive returns. Excess returns are calculated for each score by subtracting the equally weighted mean return for the appropriate size category (large, mid, small, or micro) from the raw return for the related security. Large capitalization stocks are defined as the largest 400 U.S. traded stocks ranked by market capitalization. Mid capitalization stocks are defined as the next largest 500 stocks by market capitalization. Small and micro capitalization stocks are defined as the next 2,100 and 2,000 companies, respectively.

Table 20: Returns by Score – Small Capitalization Stocks
(Stocks 901-3000 ranked by market capitalization, 01/01/1991 – 03/31/2005)

Score	Raw Return (%)		Excess Returns (%)	
	1 Month	*3 Month*	*1 Month*	*3 Month*
8	2.83%	5.98%	0.73%	1.59%
7	2.41%	5.51%	0.48%	1.29%
6	2.11%	5.22%	0.71%	1.43%
5	1.68%	4.21%	0.32%	0.42%
4	1.00%	3.27%	-0.04%	-0.30%
3	0.78%	2.84%	-0.18%	-0.65%
2	0.70%	1.78%	-0.57%	-1.74%
1	-0.35%	-0.72%	-1.37%	-3.94%

Table 21: Returns by Score – Micro Capitalization Stocks
(Stocks 3001-5000 ranked by market capitalization, 01/01/1991 – 03/31/2005)

Score	Raw Return (%)		Excess Returns (%)	
	1 Month	*3 Month*	*1 Month*	*3 Month*
8	3.44%	8.03%	1.20%	2.71%
7	2.34%	5.55%	0.52%	1.27%
6	2.08%	7.25%	1.03%	2.50%
5	1.64%	4.62%	0.42%	0.51%
4	0.57%	2.83%	-0.23%	-0.92%
3	0.54%	2.02%	-0.24%	-1.45%
2	-0.29%	0.59%	-0.81%	-2.68%
1	-1.67%	-1.20%	-1.89%	-4.16%

In the tables above, raw returns are computed using compounded, dividend inclusive returns. Excess returns are calculated for each score by subtracting the equally weighted mean return for the appropriate size category (large, mid, small, or micro) from the raw return for the related security. Large capitalization stocks are defined as the largest 400 U.S. traded stocks ranked by market capitalization. Mid capitalization stocks are defined as the next largest 500 stocks by market capitalization. Small and micro capitalization stocks are defined as the next 2,100 and 2,000 companies, respectively.

Table 22: Nonparametric Analysis of Winners and Losers
(01/01/1991 – 03/31/2005)

Score	3 Mo Raw Return	
	Winners	***Losers***
8	58.02%	41.98%
7	57.14%	42.86%
6	58.16%	41.84%
5	55.96%	44.04%
4	54.07%	45.93%
3	52.95%	47.05%
2	51.16%	48.84%
1	46.96%	53.04%

Table 23: Standard Deviation of Raw Returns By Score
(01/01/1991 – 03/31/2005)

Score	Raw Return (%)	
	1 Month	***3 Month***
8	15.16%	26.68%
7	14.69%	25.89%
6	13.29%	23.83%
5	14.25%	25.01%
4	14.73%	25.75%
3	15.17%	26.67%
2	16.45%	28.63%
1	17.60%	30.59%

In the table above, raw returns are computed using compounded, dividend inclusive returns.

Table 24: Correlation with Other Common Factors (01/01/1991 – 03/31/2005)

Factor	*Pearson Correlation Coefficient*
Insider Factor	0.030
Analyst Revision Factor	0.017
Earnings Surprise Factor	0.051
Predicted Earnings Surprise Factor	(0.006)
Momentum Factor	0.040
Valuation Factor	0.042
Growth Factor	(0.093)

Table 25: Coverage* by Year (01/01/1991 – 03/31/2005)

*Coverage refers to the number of companies with an active (non -88) score.

Year	Active Scores	Pct. Active Scores	Inactive Scores	Pct. Inactive Scores
1991	165,967	61.6%	103,289	38.4%
1992	169,136	63.0%	99,340	37.0%
1993	177,876	64.9%	96,293	35.1%
1994	185,495	68.5%	85,269	31.5%
1995	194,325	71.2%	78,571	28.8%
1996	195,220	71.3%	78,404	28.7%
1997	197,088	71.5%	78,460	28.5%
1998	195,142	70.6%	81,290	29.4%
1999	202,621	71.8%	79,551	28.2%
2000	195,028	70.2%	82,652	29.8%
2001	199,012	70.9%	81,632	29.1%
2002	174,995	61.5%	109,467	38.5%
2003	177,546	61.94%	109,144	38.1%
2004	208,528	71.3%	83,771	28.7%
2005	39,576	61.1%	25,236	38.9%

Table 26: Frequency Distribution of Scores
(01/01/1991 – 03/31/2005)

Score	Frequency	Frequency By Week	% of All Scores
8	156,149	210	5.8%
7	322,090	433	12.0%
6	345,380	465	12.8%
5	1,020,801	1374	37.9%
4	325,636	438	12.1%
3	300,005	404	11.1%
2	108,779	146	4.0%
1	113,392	153	4.2%

Table 27: Percentage Distribution of Scores by Sector
(01/01/1991 – 03/31/2005)

Score	Financials	Healthcare	Cons. Non-Durables	Cons. Service	Cons. Durables	Energy	Transpor-tation	Tech-nology	Basic Industry	Capital Goods	Utilities
8	3.5%	5.0%	4.4%	4.1%	4.2%	3.0%	4.5%	5.1%	3.7%	4.9%	3.7%
7	7.3%	10.0%	9.0%	8.6%	9.1%	7.1%	9.2%	10.0%	8.6%	8.9%	7.7%
6	7.3%	10.8%	9.9%	9.1%	10.2%	8.3%	9.3%	10.7%	9.7%	9.3%	10.2%
5	24.9%	28.1%	29.2%	27.8%	29.3%	27.3%	28.6%	28.7%	28.7%	28.0%	33.3%
4	7.5%	8.8%	9.0%	8.8%	9.3%	8.8%	8.6%	9.4%	8.7%	8.6%	10.7%
3	8.3%	7.8%	7.6%	8.2%	8.5%	8.5%	8.4%	7.9%	8.2%	8.4%	8.6%
2	3.1%	2.9%	2.6%	3.0%	3.3%	3.0%	3.4%	2.8%	2.6%	3.3%	2.9%
1	3.3%	3.5%	3.0%	2.7%	3.9%	2.7%	3.2%	3.0%	2.0%	3.0%	3.4%
-99	34.8%	23.1%	25.2%	27.8%	22.1%	31.4%	24.8%	22.3%	27.8%	25.6%	19.3%

Table 28: Results by Year
(01/01/1991 – 03/31/2005)

Year	Score	1 Mo	3 Mo
1991	**8**	5.80%	12.51%
1991	**7**	5.60%	12.08%
1991	**6**	3.95%	10.92%
1991	**5**	4.29%	9.98%
1991	**4**	3.62%	9.18%
1991	**3**	3.60%	9.33%
1991	**2**	4.09%	10.02%
1991	**1**	3.74%	11.36%
1992	**8**	3.26%	5.89%
1992	**7**	1.98%	3.87%
1992	**6**	1.76%	5.19%
1992	**5**	1.09%	3.40%
1992	**4**	-0.34%	1.90%
1992	**3**	0.12%	1.67%
1992	**2**	-0.40%	0.48%
1992	**1**	0.36%	0.15%
1993	**8**	2.98%	6.04%
1993	**7**	2.15%	5.26%
1993	**6**	1.78%	5.51%
1993	**5**	1.83%	4.75%
1993	**4**	1.45%	4.28%
1993	**3**	1.35%	4.15%
1993	**2**	1.15%	4.66%
1993	**1**	0.42%	1.99%
1994	**8**	1.39%	2.27%
1994	**7**	0.56%	1.51%
1994	**6**	0.20%	1.22%
1994	**5**	-0.13%	0.53%
1994	**4**	-0.79%	0.20%
1994	**3**	-1.14%	-1.29%
1994	**2**	-0.99%	-2.90%
1994	**1**	-2.50%	-5.55%

Year	Score	1 Mo	3 Mo
1995	**8**	2.75%	8.21%
1995	**7**	1.80%	7.18%
1995	**6**	2.51%	7.43%
1995	**5**	2.07%	6.61%
1995	**4**	1.82%	6.34%
1995	**3**	2.12%	6.44%
1995	**2**	2.57%	5.28%
1995	**1**	0.92%	3.75%
1996	**8**	2.44%	5.95%
1996	**7**	2.05%	5.42%
1996	**6**	3.01%	6.33%
1996	**5**	1.92%	4.58%
1996	**4**	1.01%	3.24%
1996	**3**	1.27%	2.92%
1996	**2**	1.69%	1.67%
1996	**1**	1.42%	-1.03%
1997	**8**	3.29%	9.12%
1997	**7**	2.68%	8.41%
1997	**6**	2.76%	7.55%
1997	**5**	2.21%	6.95%
1997	**4**	1.68%	6.18%
1997	**3**	1.23%	5.13%
1997	**2**	1.70%	4.17%
1997	**1**	0.55%	2.19%
1998	**8**	1.80%	-0.25%
1998	**7**	1.96%	-0.68%
1998	**6**	0.17%	-0.42%
1998	**5**	0.60%	-1.01%
1998	**4**	0.06%	-2.41%
1998	**3**	-0.68%	-2.77%
1998	**2**	-1.31%	-2.61%
1998	**1**	-2.69%	-2.70%

Year	Score	1 Mo	3 Mo
1999	**8**	2.88%	6.94%
1999	**7**	2.08%	6.72%
1999	**6**	1.45%	4.69%
1999	**5**	1.34%	4.97%
1999	**4**	0.84%	5.57%
1999	**3**	0.79%	4.46%
1999	**2**	1.58%	6.86%
1999	**1**	1.28%	6.03%
2000	**8**	2.15%	5.36%
2000	**7**	2.10%	3.05%
2000	**6**	1.54%	3.43%
2000	**5**	0.98%	0.97%
2000	**4**	0.50%	-1.17%
2000	**3**	-0.16%	-1.81%
2000	**2**	-1.73%	-4.48%
2000	**1**	-4.31%	-12.25%
2001	**8**	4.28%	6.53%
2001	**7**	3.75%	6.82%
2001	**6**	2.11%	4.95%
2001	**5**	1.39%	3.53%
2001	**4**	-0.67%	0.96%
2001	**3**	-1.77%	1.15%
2001	**2**	-3.16%	-2.95%
2001	**1**	-2.64%	-4.86%
2002	**8**	1.4%	-2.3%
2002	**7**	1.1%	-2.5%
2002	**6**	-0.7%	-3.9%
2002	**5**	-1.2%	-4.8%
2002	**4**	-2.5%	-6.2%
2002	**3**	-2.8%	-6.2%
2002	**2**	-2.7%	-8.0%
2002	**1**	-3.1%	-6.4%

Year	Score	1 Mo	3 Mo
2003	**8**	4.00%	16.38%
2003	**7**	4.60%	15.67%
2003	**6**	5.14%	16.44%
2003	**5**	4.74%	14.48%
2003	**4**	4.41%	13.53%
2003	**3**	5.10%	14.55%
2003	**2**	5.18%	15.39%
2003	**1**	5.17%	16.36%
2004	**8**	0.19%	1.62%
2004	**7**	0.34%	2.28%
2004	**6**	1.54%	2.51%
2004	**5**	1.08%	2.63%
2004	**4**	0.64%	2.37%
2004	**3**	1.03%	2.47%
2004	**2**	0.94%	1.56%
2004	**1**	2.00%	1.92%
2005	**8**	-0.8%	N/A
2005	**7**	0.4%	N/A
2005	**6**	-0.2%	N/A
2005	**5**	0.5%	N/A
2005	**4**	0.3%	N/A
2005	**3**	-1.3%	N/A
2005	**2**	0.2%	N/A
2005	**1**	-2.3%	N/A