The Incremental Value of Qualitative Fundamental Analysis to Quantitative Fundamental Analysis: A Field Study

by

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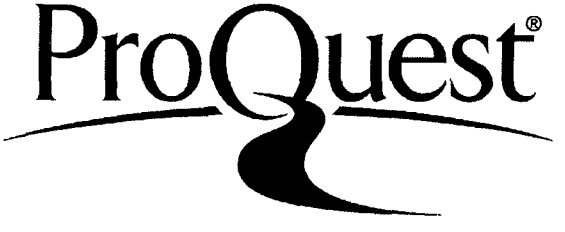

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Abstract

This field study examines whether the human-judgment component of fundamental analysis adds incremental information beyond a quantitative model designed to identify securities that will subsequently underperform the market. The subject firm (the Firm) primarily focuses on the analysis of financial statements and other accounting disclosure. This study documents abnormal returns to a sample of 203 negative recommendations issued by the fundamental analysts between February 2007 and March 2010. In addition, I find that the qualitative element of fundamental analysis is the primary driver of the Firm's ability to identify companies whose equity securities subsequently underperform the market. The Firm initiates coverage almost exclusively on large market capitalization companies with high liquidity and low short interest. These unique characteristics of the setting increase the likelihood that the results are not the product of returns to securities with high arbitrage and/or transaction costs.

Chapter 1

Introduction

In many cases, machine wins in man versus machine data analysis contests (e.g. weather forecasting (Mass, 2003) and medical diagnosis (Chard, 1987)). Nevertheless, human judgment remains a significant component in these disciplines, suggesting that man plus machine may be superior to machine alone (e.g. Morss and Ralph, 2007 examines and discusses why human weather forecasters still improve upon computer-generated forecasts well into the computer modeling era). Similarly, despite the rapid pace of technological advancement and machine-driven (i.e. quantitative) investment analysis, human judgment remains a significant element of equity analysis in practice. In this light, I examine whether the human-judgment component (i.e. qualitative) of fundamental analysis adds incremental information beyond a quantitative model designed to identify securities that will subsequently underperform the market. Researchers (e.g. Piotroski, 2000, Abarbanell and Bushee, 1998, and Frankel and Lee, 1998) have documented the returns to machine-driven quantitative analysis of financial statement data. However, limited evidence is available to assess the relative importance of the qualitative component of fundamental analysis. Research on sell-side analysts (e.g. Barber et al. 2001, Li, 2005, and Barber et al. 2010) has generally concluded that sell-side recommendations are correlated with future returns, although the evidence is mixed, suggesting sell-side analysts may be able to identify both future outperformers and future

underperformers. However, the extent to which sell-side analysts' forecasts and recommendations benefit from qualitative fundamental analysis vis-à-vis other inputs, such as access management and other non-public information, is unclear.

Through access to internal data provided by an equity research firm specializing in identifying overvalued firms through fundamental analysis, this field study contributes to the fundamental analysis literature by (1) providing additional evidence on financial statement analysts' ability to identify future underperformance and (2) assessing the determinants of these fundamental analysts' success. More specifically, this study is able to exploit internal decision making data to examine the incremental value provided by the human judgment-driven (qualitative) analysis over the computer-driven (quantitative) analysis. Hereinafter, quantitative fundamental analysis refers to the evaluation of a security through machine analysis of a company's financial statements and other disclosure, while qualitative fundamental analysis refers to execution of the same task through human judgment and analysis of the same data.

This field study examines an investment analysis firm (hereinafter referred as the Firm) that sells company-specific research reports to institutional investors. The Firm's research reports identify companies that the Firm believes are overvalued. Several characteristics of the field setting are vital to the exploration of this study's research questions. First, the Firm's research decisions are driven almost entirely by analysis of public disclosure. The Company does not generally develop or gather proprietary information through demand estimation techniques (e.g. channel checks), relationships with management teams, or the use of expert consultants. This feature of the setting enables the direct assessment of the value of financial statement analysis in stock

selection.

Second, access to data on the Firm's internal publication decisions facilitates a comparison of the contributions of the quantitative and qualitative components of the Firm's analysis. In this light, a third important feature of the Firm's publication decision process is that its quantitative model is designed specifically to identify financial statement issues or areas intended to be examined in more detail by humans (qualitative analysis). The Firm's process is designed to utilize humans' at the point where it is not technologically and/or economically feasible for the Firm to continue to use machines. While the narrow set of analysis techniques may limit the generalizability of the field setting, the fact that the Firm's quantitative and qualitative techniques share a common focus provides a clear link and delineation between man and machine. That is, man and machine are employed with parallel intentions and do not perform unrelated, or distinct, tasks.

Additionally, the Firm does not generally publish research on companies with less than $1.0 billion in market capitalization, less than $10.0 million in daily trading volume, or greater than 10.0% short interest (as a percentage of float).[1] These characteristics of the sample increase the likelihood that the performance of companies subject to research coverage is implementable, economically significant, and not driven by securities with high transaction and/or arbitrage costs as is often the case with short positions (see Mashruwala et al., 2006).

This research contributes to the literature by providing additional evidence on the usefulness of accounting-based fundamental analysis. In addition, this research

[1] The mean (median) market capitalization of the 203 companies covered by the Research Firm during the sample period was $5.6 billion ($3.3 billion).

contributes to the literature by separately studying the contribution of the quantitative and qualitative components of accounting-based fundamental analysis. While the evidence is mixed, I find that the Firm is able to identify companies whose equity securities subsequently underperform the market by economically significant amounts. For example, the size-adjusted returns in the six months (nine months) following publication of a sample of 203 negative (i.e. sell) recommendations issued by the Firm between February 2007 and March 2010 averaged -4.4% (-6.3%). In addition, I find that the qualitative element of fundamental analysis accounted for nearly all of the Firm's ability to identify underperformers.

In the next section, I summarize relevant theoretical and empirical literature. In Section III, I provide additional detail on the field setting and discuss the advantages and limitations of, and the motivation for, the setting, and I introduce hypotheses. In Section IV, I discuss data and methodology, present results, and test the robustness of results. I conclude in Section V.

Chapter 2

Theoretical Background and Prior Research

2.1 Theoretical Background – The Man/Machine Mix

Researchers in two distinct fields outside of finance and accounting (medical diagnosis and weather forecasting) have focused a considerable amount of effort on studying the man/machine mix in decision making. The investment decision making process is quite similar to medical diagnosis and weather forecasting decisions in the sense that practitioners generally rely on a combination of computer modeling, classroom training, and personal experience to analyze and interpret numerical and non-numerical data. The unique element of the investment decision process is that the outcome being predicted is the result of an uncertain outcome of a multi-player game (i.e. a market). In contrast, the decision making in medical diagnosis and weather forecasting is made with respect to a definitive state (i.e. a patient has or does not have a condition, it will rain or it will not rain). While the primary differences between the decision making processes in each of these broad fields are interesting, they do not hold significant implications for the theoretical framework for, and design of, this research.

Researchers in both medical diagnosis and meteorology often appeal to three human deficiencies when explaining empirical results documenting computers superiority to humans in certain decision making contests. The first is humans' imperfect long-term memory (e.g. Chard, 1987 and Allen, 1981). The second is humans' limited ability to

execute complex mathematical/logical calculations. The first two factors are generally viewed as limitations that, in combination, result in humans' use of heuristics or 'rules of thumb' in decision making.

The use of simple heuristics in lieu of formal calculations is believed to manifest itself in a third deficiency: cognitive biases evident in humans' belief revisions following receipt of new information. In early experimental work in cognitive psychology (e.g. Kahneman and Tversky, 1973 and Lyon and Slovic, 1976), researchers documented compelling evidence suggesting humans tend to ignore prior probabilities in making probability estimates. These studies provide evidence that both unsophisticated and sophisticated subjects (i.e. those with statistical training) tended to estimate probability based on the most salient data point in a specific case. Further, the results of these and related studies showed that human subjects' judgments deviated markedly from the "optimal" or normative (i.e. under a Bayesian framework) decision. For example, these experiments suggested that if a subject was provided the following case: a drug test correctly identifies a drug user 99% of the time, false positives account for 1%, false negatives do not occur, and 1% of the test population actually uses the drug being tested for, the majority of the subjects would estimate that the probability of a positive test correctly identifying an actual drug user was 99% (dramatically different than a probability of ~51% under Bayes' theorem).

Another well-documented (e.g. Evans and Wason, 1976 and Doherty et al., 1982) cognitive bias in decision making is that humans exhibit difficulty in revising their views upon receipt of information contradicting their priors (i.e. humans tend to ignore or place little weight on information that contradicts their prior beliefs, and they tend to

overemphasize confirming evidence).

Finally, related experimental work documents humans' tendency to knowingly ignore optimal decision making rules and rely on intuition, which predisposes them to alter decisions arbitrarily (e.g. Liljergren et al. 1974 and Brehmer and Kuylenstierna, 1978). However, it is humans' reliance on their intuition that other researchers cite as a primary reason for their success in adding incremental performance in man and machine versus machine alone contests (Doswell, 1986).

A vast cognitive psychology literature has primarily focused on explaining deficiencies in human cognition. While the problem solving or 'knowledge acquisition' areas of the cognitive literature focus on the study of human decision making processes, typically, after new processes are discovered, artificial intelligence developers have consistently been able to program computers to replicate the human processes with accuracy superior to humans. In this light, it is likely that a modern computer could easily outperform Thomas Bayes himself in a contest of applying Bayes theorem in a complex setting. Nevertheless, it is within this simple concept that support for the continued role of humans in various decision making and prediction fields is evident. If nothing else, the mere fact that humans are required to program or teach machines how to make decisions suggests humans possesses an inherent capability that machines do not have. Doswell (1986) suggests it is largely the unknown process of interaction between the left and right brain that allow a small portion of human weather forecasters to consistently outperform machines. More scientifically, Ramachandran (1995) provided tremendous insight into brain functions from his study of stroke victims. Ramachandran concludes that the left brain hemisphere consistently enforces structure and often

overrides certain anomalous data points. However, at a certain point when an anomaly exceeds a threshold, the right brain takes over and "forces a paradigm shift." This human process provides a clear role for human interaction with machines in decision making processes. Humans' knowledge of the machine and underlying data provide them the opportunity to understand when structural changes or anomalies may result in machine-generated decision or forecast errors. In addition, it is plausible that a primary right hemisphere function may provide humans an advantage in incorporating powerful anecdotal evidence in the decision making process. If nothing else, humans may simply have access to data that is not machine-readable and/or economically feasible to provide to the machine.

Even if humans' primary role is simply to understand the shortcomings of the machine she designed, a human role in decision making is likely to continue in many fields for the foreseeable future.

2.2 Theoretical Background – The Analysts Role in Markets

A distinct, but related, theoretical concept critical to this study's research question, is the efficiency of equity markets with respect to public information. The fundamental analysts' role in an efficient market is unclear if her information is revealed perfectly to all market participants (e.g. Fama, 1970 and Radner, 1979). Alternatively, in a market with an information-based trading feature, the fundamental analyst plays a role in costly arbitrage. Grossman and Stiglitz (1980) observe that it is inconsistent for both the market for assets and the market for information about those assets to always be in equilibrium and always be perfectly arbitraged if arbitrage is costly. Stated differently, if arbitrage is costly, either agents engaging in arbitrage are not rational or the market is not always

perfectly arbitraged. The only manner in which information is valuable to investors is if it is not fully revealed in market prices. Indeed, if prices fully reveal aggregate information, economic incentives to acquire private information do not exist, resulting in an information paradox: why would the fundamental analyst expend resources to obtain information that has no utility? In this light, the study of the fundamental analyst is, at its core, the study of market efficiency.

The existence of a large information acquisition-based equity investment industry (commissions paid in exchange for equity research totaled between $35 and $40 billion in 2001[2]) suggests that either equity prices do not fully reveal information or important actors in equity markets do not employ rational expectations technologies. In this light, if noise is introduced (as modeled in Grossman and Stiglitz) to the economy, prices convey signals imperfectly and it is still beneficial for some agents to expend resources to obtain information.[3] It is within this noisy rational expectations economy that information-based trading obtains. Researchers have proposed various sources of noise, primarily in the form of uninformed or 'irrational' actors. Coincidentally, the prevalence of irrational traders is commonly justified by appeals to many of the same cognitive biases discussed in Section 2.1 above. For example, Hirshleifer (2001) discusses the role of these common cognitive biases, including humans' use of heuristics, in market efficiency. In

[2] Simmons & Company International, 2009.

[3] Information is not valuable in the Grossman and Stiglitz model without noise because investors begin with Pareto optimal allocations of assets. If this is the case, the arrival of noiseless information does not instigate trade because the marginal utilities of all investors adjust in a manner that keeps the original allocation optimal. This is possible because the informed and uninformed agents interpret the arrival of information identically (the uniformed utilizing their rational price inference technology). When noise is introduced to price, the inference technology provides uninformed investors with different information than the noiseless information obtained at cost to the informed trader. Trade results because investors must guess which interpretation of the information is correct.

particular, Hirshleifer postulates that idiosyncratic mispricing could be widespread if a large portion of market participants' decisions' are limited by the same cognitive biases.

2.3 Quantitative Fundamental Analysis

During the past several decades, researchers have conducted various tests of equity markets' efficiency with respect to accounting information. Early research focused on the market's efficiency with respect to the time series properties of earnings (e.g. Bernard and Thomas, 1989). Subsequent research, including Sloan (1996), examined the market's efficiency with respect to the components of earnings (e.g. cash earnings and accrual earnings). Following these studies, empirical tests of more granular quantitative fundamental analysis developed quickly due to researchers' ability to develop and conduct large sample tests of quantitative models using widely available, machine-readable financial statement and other disclosure data. Next, I summarize a few of the many papers in this area.

Abarbanell and Bushee (1998) develop and test a model with signals reflecting traditional rules of fundamental analysis, including changes in inventory, accounts receivable, gross margins, selling expenses, capital expenditures, effective tax rates, inventory methods, audit qualifications, and labor force sales productivity. The authors find significant abnormal returns to a long/short trading strategy based on their model. Further, the authors conclude that their findings are consistent with the earnings prediction function of fundamental analysis given that a significant portion of abnormal returns to their strategy are generated around subsequent earnings announcement. In a similar study focused on high book-to-market firms, Piotroski (2000) documents significant abnormal returns to an accounting-based fundamental analysis long/short

trading strategy. Piotroski focuses on high book-to-market firms given his view that they represent neglected and/or financially distressed firms where differentiation between winners and losers has the potential to reward analysis the most. Piotroski concludes that his findings suggest the market does not fully incorporate historical financial information into prices in a timely manner. Beneish et al. (2001) examine the usefulness of fundamental analysis in a group of firms that exhibit extreme future stock returns. The authors show that extreme performers share many market-related attributes. With this knowledge, they design a two-stage trading strategy: (1) the prediction of firms that are about to experience an extreme price movement and (2) the employment of a context-specific quantitative model to separate winners from losers. The motivation of Beneish et al. was the idea that fundamental analysis may be more beneficial when tailored to a group of firms with a large variance in future performance. In a similar fashion, Mohanram (2005) combines traditional fundamental signals, such as earnings and cash flows, with measures tailored for growth firms, such as earnings stability, R&D intensity, capital expenditure, and advertising. Mohanram then tests the resultant long/short strategy in a sample of low book-to-market firms and documents significant excess returns. Similar to Piotroski (2000) and Beneish et al. (2001), Mohanram concludes that incorporating contextual refinement in quantitative fundamental analysis enhances returns to the analysis. While the evidence clearly supports that quantitative models can be refined and tailored to specific settings, in practice, human judgment remains a significant component of financial statement analysis, in all likelihood, due to the difficulty in designing quantitative models capable of incorporating the extent of contextual information available for discovery through firm-specific (i.e. qualitative)

fundamental analysis.

2.4 Research on Sell-Side Analysts

The literature on qualitative fundamental analysts focuses primarily on sell-side analysts. With a few caveats, researchers originally concluded that sell-side analysts provide useful information in the form of: (1) earnings estimates more accurate than naive time-series earnings forecasts and (2) recommendations that are correlated with future returns. This literature is best summarized by Brown and Rozeff (1978), who conclude that their results "overwhelmingly" demonstrate that analysts' forecasts are superior to time-series models. Brown et al. (1987) provide further evidence regarding the superiority of analyst forecasts to time-series models. In addition, Brown et al. provide evidence suggesting that analyst forecasts benefit from both an information (utilization of superior information available at the time of the formulation of the time-series forecast) and timing (utilization of information available subsequent to the time of the formulation of the time-series forecast) advantage relative to time-series models. While researchers have generally taken the superiority of analyst earnings forecasts as a given following Brown et al. (1987), Bradshaw et al. (2009) provide new evidence suggesting that simple random walk earnings forecasts are more accurate than analysts' estimates over long forecast horizons and for smaller and younger firms. The Bradshaw et al. research reopened important questions about the efficiency of the market for information on equities. If analysts are only able to forecast earnings more accurately than a random-walk model for large firms over short horizons, a setting in which analysts' forecasts are more likely to benefit from management forecasts of earnings, why do analysts continue to be an important actor in equity markets? Indeed, the motivation of early research on

analyst forecasts was motivated by an appeal to the efficiency of the market for equity analysis: "the mere existence of analysts as an employed factor in long run equilibrium means that analysts *must* make forecasts superior to those of time series models" (Brown and Rozeff, 1978).

Research on sell-side analyst recommendations has also generally concluded that analyst recommendations are positively correlated with future returns. Barber et al. (2001) documented that a hedge strategy of buying (selling short) stocks with the most (least) favorable consensus recommendations can generate significant abnormal returns. However, the authors note that the strategy requires frequent trading and does not generate returns reliably greater than zero after taking into account transaction costs. Nonetheless, the results support a conclusion that sell-side analysts' recommendations convey valuable information. Barber et al. (2010) find that abnormal returns to a strategy based on following analyst recommendations (ratings) can be enhanced by conditioning on both recommendation levels and changes. Consistent with prior research and of particular relevance to this study, Barber et al. (2010) also document asymmetry with respect to the value of analyst recommendations: abnormal returns to shorting sell or strong sell recommendations are generally greater than returns to going long buy or strong buy recommendations. Further, the authors show that both ratings levels and changes predict future unexpected earnings and the contemporaneous market reaction. The authors do not conduct tests to determine if the returns to their strategy are robust to transaction costs. Li (2005) provides important evidence suggesting (1) analyst performance, proxied for by risk-adjusted returns to recommendation portfolios, is persistent and (2) abnormal returns can be generated by a trading strategy consisting of

following the analysts with the best historical performance. Li finds that returns to the strategy are significant after accounting for transaction costs. While the author is able to establish that certain analysts are able to consistently outperform their peers, Li's research does not endeavor to study the determinants of analysts' success.

Wahlen and Wieland (2010) use a quantitative financial statement analysis model to separate winners from losers within sell-side analyst consensus recommendation levels. Their research design effectively employs the approach used by the Firm, but in reverse order (qualitative analysis followed by quantitative analysis). Wahlen and Wieland document significant abnormal returns to hedge strategies based on their methodology.

Another significant area of research documents systematic biases evident in sell-side analyst forecasts and recommendations. Several empirical studies find evidence consistent with theoretical predictions of analyst herding models (e.g. Trueman (1994)). For example, Welch (2000) finds that the buy or sell recommendations of sell-side analysts have a significant positive influence on the recommendations of the next two analysts. Welch also finds that herding is stronger when market conditions are favorable. Hong et al. (2000) find that inexperienced analysts are less likely to issue outlying (bold) forecasts due to career concerns (i.e. inexperienced analysts are more likely to be terminated for inaccurate or bold earnings forecasts than are more experienced analysts). Another well-documented bias evident in sell-side analyst earnings forecasts and recommendations is the influence of various investment banking relationships. Lin and McNichols (1998) find that lead and co-underwriter analysts' growth forecasts and recommendations are significantly more favorable than those made by unaffiliated

analysts. Michaely and Womack (1999) show that stocks recommended by underwriter analysts perform worse than buy recommendations by unaffiliated analysts prior and subsequent to the recommendation date. Dechow et al. (2000) find that sell-side analysts' long-term growth forecasts are overly optimistic around equity offerings and that analysts employed by the lead underwriters of the offerings make the most optimistic growth forecasts. Taken as a whole, the literature supports the hypothesis that the value of sell-side research is significantly impaired by investment banking relationships between brokerage firms and their clients.

2.5 Limitations of Research on Fundamental Analysis

In investment analysis textbooks, quantitative and qualitative fundamental analysis techniques are often treated as distinct, but complimentary disciplines.[4] In empirical settings, the separate study of the two disciplines (in particular, the separate study of qualitative fundamental analysis) is complicated by institutional features. The marriage of quantitative and qualitative analysis, due to traditional institutional segregation, is surprisingly uncommon in the investment industry (e.g. Hargis and Paul, 2008 and Grantham, 2008).[5] While this characteristic of the investment industry would appear to facilitate the study of qualitative fundamental analysis in isolation, the close relationships between sell-side analysts and management teams complicate the study of the majority of qualitative fundamental analysts. Because a primary source of sell-side analysts' information is developed through direct communication with company insiders, it is unclear whether they possess an information advantage relative to other market

[4] See, for example, *Security Analysis*, Graham and Dodd.

[5] In his January 2008 Quarterly Letter "The Minsky Meltdown and the Trouble with Quantery," Jeremy Grantham, Co-Founder GMO LLC, discusses the obstacles and traditional institutional segregation of quantitative and fundamental analysis.

participants.[6] To the extent sell-side analysts make forecasts or recommendations that lead to market outperformance, it is unclear whether this is a result of qualitative fundamental analysis or access to inside information. Given that the most readily available analyst data to researchers is sell-side analyst data, their potential access to inside information is a significant barrier to empirical investigations of traditional qualitative fundamental analysis. While the implementation of Regulation Fair Disclosure (an SEC mandate that all companies with publicly traded equity must disclose material information to all investors at the same time, Reg FD hereinafter) in 2000 may have limited sell-side analysts' access to inside information, it is still probable that sell-side analysts obtain some inside information through their extensive private interactions with managers.

An alternative format for the study of fundamental analysis is the use of a laboratory setting. Bloomfield et al.'s (2002) review of experimental research in financial accounting includes a discussion of papers that examine the determinants of analysts' forecasts and valuation performance. Much of this research is limited due to the low skill level of affordable subjects (primarily students). Further, subjects in experimental studies may exhibit different effort levels from analysts in a market setting because laboratory subjects do not have 'skin in the game' (i.e. their financial well-being, careers are not at stake). Though the literature is limited, primarily due to cost, a few studies examine the performance of experienced practitioners in laboratory settings. For example, Whitecotton (1996) finds that experienced sell-side analysts outperform student subjects in forecast accuracy. But, even the use of experienced practitioners cannot

[6] The widely influential Mosaic Theory of security analysis (Fisher, 1958) called for the use a wide variety of both public and private sources of information in security valuation. This theory continues to be a primary driver of the equity analysis techniques employed by modern-day sell-side analysts.

overcome certain limitations of laboratory settings, including the subjects' motivation level and the researchers' ability to accurately replicate the time and information resources available to practitioners in their natural setting.

While, taken as a whole, the literature on sell-side analysts establishes that sell-side analysts' earnings estimates and recommendations convey valuable information to equity market participants, several important findings question the extent of the value provided: (1) recent work by Bradshaw et al. (2009) reopens the question about the superiority of analysts' earnings estimates; (2) returns to several documented analyst recommendation-based trading strategies may not be significant after accounting for transactions costs; and (3) analysts' career concerns appear to bias their forecasts and recommendations. Given these issues with sell-side analyst research and the potential availability of inside information to sell-side analysts (discussed heretofore), researchers have sought data on unaffiliated (with an investment bank) analysts. However, limited data is available on these types of analysts.

2.6 Research on Accounting-Based Fundamental Analysts

As a result of the effects of the various biases imparted on sell-side equity research by inherent conflicts of interest, a significant unaffiliated (i.e. independent) equity research industry has emerged. In addition to investors' awareness of the biases and resultant deficiencies inherent in the research produced by financial institutions with investment banking functions, an SEC enforcement action (the 2003 "Global Settlement") provided a separate catalyst for the growth of independent equity research. Among other penalties, the Global Settlement required ten of the world's largest investment banks to fund $432.5 million in independent research. Specifically, each of the ten banks were required to use

funds to make research available to their customers through contracts with a minimum of three independent research firms for a period of five years.

Several firms utilizing forensic accounting, financial statement analysis, and other qualitative fundamental analysis techniques (i.e. traditional fundamental analysis) exist in the unaffiliated equity research industry. These firms offer a rich setting for accounting researchers due to their heavy reliance on analysis of financial statements and other financial disclosure, as well as their relative lack of institutional conflicts of interest and biases. Abraham Briloff, whose work was regularly published in *Barron's* between 1968 and 2000, was an early practitioner of traditional fundamental analysis. Three studies examine the performance of companies criticized in Briloff's analyses. Foster (1979) documents an immediate and permanent (30 day) drop in the share price of 15 firms criticized by Briloff in *Barron's*. In a follow-up article, Foster (1987) finds similar results in a slightly larger sample (21 firms). Desai and Jain (2004) find that the companies in a 48-firm sample of Briloff-critiqued firms experienced one-and two-year significant abnormal returns of negative 15.5 percent and negative 22.9 percent, respectively. The authors show that a decline in future operating performance appeared to be the catalyst for the stock price underperformance. Desai and Jain conclude that their results demonstrate the importance of financial statement analysis.

Most closely related to this research is Fairfield and Whisenant's (2001) study of the Center for Financial Research and Analysis (CFRA hereinafter). The scarcity of evidence on the qualitative component of fundamental analysis motivated Fairfield and Whisenant to examine the performance of a unique set of analyst recommendations by CFRA. Similar to the subject firm of this study, the CFRA analysts relied on the

quantitative and qualitative analysis of financial statements and other public disclosure as opposed to other sources of information (e.g. relationships with management teams, access to industry experts, etc.). Fairfield and Whisenant describe CFRA's recommendations as the product of analysis designed to identify firms "experiencing operational problems and particularly those that employ unusual or aggressive accounting practices to mask the problems." The authors documented the CFRA analysts' ability to identify firms that subsequently underperformed during a four year period between 1994 and 1997.[7] In addition to negative abnormal returns, the authors find statistically significant deterioration in the financial performance of the 373-firm sample. The authors conclude that their results: (1) are consistent with the analysts' claims that they are able to identify firms that are successfully masking operational problems with aggressive accounting and (2) provide evidence about the usefulness of traditional financial statement analysis. Because Fairfield and Whisenant did not have access to CFRA's quantitative models or other internal data, their research does not provide direct evidence on the usefulness of the qualitative component of fundamental analysis. Stated differently, their results could merely represent a test of CFRA's quantitative models, which may not have been drastically different than quantitative models studied by researchers of quantitative fundamental analysis (Abarbanell and Bushee (1998), etc.).

[7] During this period, the CFRA analysts employed a proprietary research methodology designed to identify firms with "quality of earnings" deficiencies.

Chapter 3

The Field Setting and Hypotheses

3.1 Motivation for the Field Setting

Similar to CFRA, Voyant Advisors (the Firm) is an investment research firm employing quantitative and qualitative analysis in the generation of research reports on individual firms.[8] The Firm publishes research reports which identify firms it believes are subject to a heightened risk of equity market underperformance. A subtle, but important difference from CFRA is that the Firm focuses on identifying companies that underperform the market. While CFRA (according to Fairfield and Whisenant) sought to identify companies that would exhibit deterioration in financial performance, the Firm simply seeks to identify companies that will not meet investors' expectations. The Firm markets and sells it research primarily to hedge funds and mutual funds. More than half of the Firm's clients are hedge funds, and the total number of clients is between 50 and 150.[9] Through examination of the output of the Firm's quantitative models and the final research product resulting from its additional qualitative analysis, this study documents the incremental contribution of qualitative analysis to financial statement-based quantitative signals in identifying firm underperformance.

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[8] Voyant Advisors LLC (the Firm) was founded by Matthew R. Kliber and Derek A. Laake in January 2007. The Firm began publishing research in February 2007. The author has been an employee of the Firm since July 2007. The Firm does not use statistical performance analysis to market its research products. The Firm does not intend to market its research products based on the empirical analysis conducted in this paper.

[9] More specific details are not disclosed due to the Firm's competitive concerns.

In addition to access to internal decision data, the field setting provides other natural advantages. While the Firm's analysts generally attempt to open a dialogue with investor relations and/or finance department personnel at companies subject to research coverage, the Firm does not maintain relationships with management teams similar to those forged between sell-side analysts and management teams. In conjunction with their interaction with personnel at research subject companies, the Firm's analysts explain the nature of their research (it is typically described as forensic accounting analysis). In addition, dialogue between the Firm and company personnel is generally limited to factual information about companies' operations, accounting policies, and financial reporting. In addition, the Firm is not engaged in investment banking and generally does not maintain commercial relationships with publicly traded companies. Further, the Firm works on research reports in teams and does not publish the names of individual analysts on its research reports. The Firm believes this choice mitigates, to some degree, the career concern bias evident in sell-side equity research. Collectively, these features of the Firm's structure and process may prevent, to some degree, several of the well-documented biases that negatively impact sell-side analysis.

The Firm's relationship with the market through its clients is another important element of the research setting. The Firm carefully limits the distribution of its research through client selectivity, premium pricing, and copyright control. The Firm's marketing strategy is built around the goal of working with a relatively small group of clients in order to preserve the value of the research output. Based on their experience in the equity research industry, the Firm's founders believed that other research services providing short recommendations were too widely disseminated to provide maximum value (i.e. the

value of the signal is inversely related to the size of the client base). This feature of the Firm reduces the likelihood that any significant stock returns in the months following the Firm's research coverage initiation are the result of the publication of the research itself as opposed to subsequent underperformance by the published on companies. Due to similar concerns about the usefulness of its research, the Firm publishes research primarily on large-capitalization equities (the Firm rarely publishes on companies with less than $1.0 billion dollar market capitalization or less than $10.0 million in average daily trading volume).

As seen in Table 1, the mean (median) market capitalization of the 203 Firm-covered companies during the sample period was $5.57 billion ($3.34 billion). In addition, the average period of open, active research coverage on the 203 companies was 163.0 days (the Firm closes coverage on companies by reducing its subjective risk rating). The Firm's subjective risk ratings range from 1 to 10, with 10 representing the highest risk of underperformance. The act of reducing a risk rating to 5 or below is understood by the Firm's clients to indicate that the Firm no longer believes the risk of underperformance is elevated.

In addition to limiting the market impact of the Firm's publications, the publication restrictions result in a sample that helps to address several issues evident in accounting-based anomaly or trading strategy studies. It is well known that the returns to accounting-based quantitative trading strategies are significantly smaller for large firms. For example, Piotrsoki (2000) acknowledges that returns to his quantitative fundamental analysis strategy are not statistically significant in a sub-sample of the largest third of the firms in the overall sample. Further, Mashruwala et al. (2006) provide

TABLE 1

Publication Sample Descriptive Statistics

Panel A: Full-publication sample (203 firms)

Variable	Mean	Median	Standard Deviation	Lower Quartile	Upper Quartile
Traditional operating accruals	-0.0321	-0.0299	0.0597	-0.0645	-0.0001
Percent accruals	-0.2511	-0.0832	0.6154	-0.3914	0.4374
Earnings Risk Assessment score (VER)	42.96	41.00	6.59	32.33	54.67
Market value of equity	5,574.4	3,341.8	6,536.5	2,061.5	5,831.8
Return on assets	9.31%	8.84%	5.99%	4.36%	12.73%
Market value/book value	3.23	2.75	2.19	1.55	4.21
Market value/net income	22.52	17.67	18.11	11.60	25.28
Price per share	41.01	33.88	24.29	18.56	51.48
Three-year sales growth %	13.82%	11.08%	14.68%	5.37%	21.96%
Short interest as a % of float	4.44%	3.82%	3.64%	1.98%	7.10%

Panel B: Brief report sample (122 firms)

Variable	Mean	Median	Standard Deviation	Lower Quartile	Upper Quartile
Traditional operating accruals	-0.0348	-0.0299	0.0713	-0.0819	0.0137
Percent accruals	-0.2858	-0.0832	0.8204	-0.4610	0.5226
Earnings Risk Assessment score (VER)	42.26	42.50	7.87	32.33	58.33
Market value of equity	5,217.8	2,716.0	6,209.1	1,888.7	5,625.5
Return on assets	9.21%	10.01%	4.98%	4.36%	12.24%
Market value/book value	3.11	2.89	2.02	1.42	3.89
Market value/net income	21.69	17.22	16.93	12.82	21.16
Price per share	33.64	27.94	21.00	14.28	41.95
Three-year sales growth %	14.64%	10.51%	15.90%	6.86%	21.96%
Short interest as a % of float	4.83%	4.47%	4.95%	2.56%	7.33%

Panel C: Full-length report sample (81 firms)

Variable	Mean	Median	Standard Deviation	Lower Quartile	Upper Quartile
Traditional operating accruals	-0.0281	-0.0261	0.0423	-0.0516	-0.0024
Percent accruals	-0.1988	-0.1265	0.3492	-0.3596	0.3822
Earnings Risk Assessment score (VER)	44.01	41.00	6.18	36.67	51.33
Market value of equity	6,111.5	3,919.0	6,938.7	2,703.0	7,357.3
Return on assets	9.46%	8.42%	6.01%	4.14%	13.30%
Market value/book value	3.41	2.53	2.84	1.93	4.21
Market value/net income	23.77	18.48	19.79	10.09	27.65
Price per share	52.1	34.65	30.13	33.40	55.19
Three-year sales growth %	12.59%	12.63%	11.43%	5.37%	18.06%
Short interest as a % of float	3.84%	3.82%	3.22%	1.98%	5.13%

TABLE 1, continued

The sample period is February 2007-March 2010, consisting of 203 seperate initiations of research coverage. The Firm publishes two types of initiation reports: brief reports (4 to 6 pages) and full-length (12 to 20 pages). Brief reports require approximately 50 man-hours to complete, while full-length reports require approximately 120 man-hours to complete. The brief report sample contains 122 companies. The full-length report sample contains 81 companies. The full-publication sample contains all 203 of the publications. Traditional operating accruals are defined as net income less cash from operations during the most recently disclosed trailing twelve-month period divided by average total assets over the same twelve-month period. Percent accruals has the same numerator as operating accruals, but the denominator is the absolute value of trailing twelve-month net income. Return on assets is trailing twelve-month net income divided by average total assets. VER score, market value of equity, price-per-share, and short interest as a % of float are measured at the beginning of the quantitative screening month. Book value is measured at the most recent fiscal quarter. Three-year sales growth is the average annual sales growth in the three most recent fiscal years.

evidence suggesting returns to Sloan's (1996) accruals strategy are concentrated in low-price and low-volume stocks where arbitrage costs (bid-ask spreads, short-sale borrowing costs, price impact of trades, etc.) are likely to be high. Mashruwala et al. conclude that their results suggest transaction costs impose a significant barrier to exploiting accrual mispricing.

Finally, the Firm generally does not initiate coverage of companies with short interest (as a percentage of free float) in excess of 10%. This choice is primarily motivated by the Firm's desire to provide its clients with research where a 'bear' or short thesis on a particular company has not already been well-circulated in the institutional investment community. In addition, the Firm believes the utility of its research is enhanced if it provides its clients with research ideas where liquidity and short-sale borrowing costs would not consume a significant portion of potential trading profits. This feature of the setting further reduces the likelihood that results found in this study are the result of market frictions such as high borrowing costs.

3.2 The Firm's Research and Publication Process

Since it began conducting research in January 2007, the Firm has employed a systematic two-step research process (a quantitative analysis step followed by a qualitative analysis step) to internally identify and initiate coverage on three to eight new US listed companies per month which it believes are (1) exhibiting signs of fundamental business deterioration, (2) facing competitive landscape challenges, and/or (3) experiencing operational inefficiencies. The Firm focuses on companies where it believes these signs are not accurately reflected in reported earnings, other headline financial measures, consensus sell-side analyst estimates and recommendations, and/or general investor

sentiment. The Firm provides continuing coverage of companies following research initiation until the point at which the Firm concludes that the risk of underperformance has abated. In addition, the Firm does not publish reports on companies at the behest of its clients. While this choice is motivated by the Firm's desire to avoid the appearance of impropriety or collusion, it improves the field setting by strictly limiting the methods used in the selection of companies for publication to the Firm's internal processes.

The first research step involves a quantitative screen utilizing data from commonly-known sources such as Reuters, Compustat, Factset, and others. The specific metrics used in the quantitative screens and how they are combined will not be described in this paper because this is the Firm's intellectual property; however, a broad description of the Firm's model follows.

The model includes approximately 20 industry/sector-specific variables in the following areas: (1) working capital account quality; (2) cash flow quality; (3) fixed asset account quality; (4) soft asset account quality; and (5) governance/incentives. While more complex, the model employed by the Firm is broadly similar to models employed by academics such as Abarbanell and Bushee (1998) and Dechow et al. (2010). Dechow et al. employ a multi-factor quantitative model to study SEC Accounting and Auditing Enforcement Releases (AAERs) issued between 1982 and 2005. Finally, the Firm's quantitative model only uses data that can be found in a Firm's public SEC filings. One important factor in the model is a measure of operating accruals (a variation of percent accruals as in Hafzalla, et al. 2010). Further, a significant portion of the factors in the model are variations of specific operating accruals that are components of total operating

accruals. According, this metric is used as a baseline comparison in the empirical tests of the quantitative model in Section 4.2.

The output of the Firm's quantitative model is a rating for each company called an earnings risk assessment score (VER). The VER scores range from 0 to 100 and are related to, but distinct from, the 1 to 10 risk rating (discussed heretofore) assigned to companies during the publication process (the 1 to 10 risk rating is subjective and often differs significantly from where the VER score fell).

Generally, an initial manual review is performed on the quintile of companies with the highest VER scores. The second step (qualitative analysis) begins with this manual review of the quantitative model factors, intended to eliminate false positives. For example, an information technology service provider identified by the quantitative screen for an elevated level of days sales outstanding could be eliminated from publication consideration if slower collections are rationalized by the successful launch of a new service targeted at government entities. Similarly, a sporting goods company, identified by the quantitative model for exhibiting a statistically unusual level of inventory, may be preparing to launch its product line in a new geography. If the initial manual review of the model uncovers a compelling economic or fundamental rationale for the specific areas of concern identified by the quantitative model, the Firm's analysts will cease researching the Company. This process encompasses an evaluation of approximately 250 companies per month. These manual reviews are conducted by the Firm's most senior analysts and typically take anywhere between a few minutes and one hour each.

If a company is not eliminated in the initial manual review stage it is assigned to a

primary analyst. The primary analyst is provided a short list of potential issues or areas of concern identified by the quantitative model and by the senior analyst during the initial manual review. The analyst is instructed to use these areas as the starting point for her research. The primarily analysts' research methods include the development of an understanding of the relation between quantitative model factors and the specific operations, business fundamentals, and competitive environment of a company. In addition, the Firm's analysts evaluate corporate governance, financial reporting incentives, and internal controls. The primary source of information for the second step of the research process is publicly available disclosure from the company and its peers. For the purposes of this study the initial manual review and subsequent primary analyst research are collectively referred to as qualitative fundamental analysis. This study is designed (as detailed in section 4) to consider these various human processes collectively as one step. Some actual examples of qualitative analysis are summarized next.

In one case, the quantitative model identified an increase in the useful life of intangible assets at a semiconductor company. The primary analyst then performed various analyses and employed judgment to assess whether the increase in useful life may have been rational. The intangible assets turned out to be comprised of acquired patents; therefore, the analyst assessed whether evidence suggested the patents had become more defensible and/or whether the pace of technological change in the type of products protected by the patents had slowed in recent periods. In addition, the analyst assessed the materiality of the change in useful life to reported earnings and other financial metrics. The result of the qualitative analysis was the assessment that the increase in useful life was not rationalized by the underlying economics of the intangible assets and

that the increase resulted in a material overstatement of earnings. As a result, the Firm decided to perform additional qualitative analysis on the company and eventually initiated research coverage of the semiconductor company with a risk rating of 8. A second example is the analysis of a timber company operating in China during 2010. The timber company was flagged by the quantitative model for a surge in various working capital account levels. The initial reviewer was skeptical of the timber company's representations on its conference call that inclement weather (flooding) was to blame. Accordingly, the company was assigned to a primary analyst. When the primary analyst determined that the deterioration was evident in the working capital accounts identified by the quantitative model before any flooding occurred, the Firm decided to publish research on the timber company with a risk rating of 9.

These examples illustrate the level and various types of human judgment involved in the second step of the research process, as well as the difficulty that even the most sophisticated programmer would face in attempting to replicate the Firm's human processes and judgments with a computer.

During the second phase of the research, the Firm makes a decision among three publication choices: (1) no publication; (2) publish a brief report; or (3) publish a full-length report. Brief reports typically take 50 man hours to complete and are generally 4 to 6 pages in length (see Appendix 1 for an example). Full-length reports, which represent the Firm's highest-conviction recommendations, typically take 100 to 150 man hours to complete and are generally 12 to 20 pages in length (see Appendix 2 for an example). Typically, when a name is assigned to a primary analyst the intent is to develop a thesis on the Company that would support a full-length report. If at any point

during the second step of the Firm's research process, it no longer believes the company is subject to a high risk of underperformance, the Firm will discontinue research and not publish a report. If the Firm determines that the risk of underperformance is not high enough to warrant a full-length report, it may elect to discontinue further qualitative research and publish a brief report. In this sense, the Firm's full-length reports represent its research recommendations where it has conducted the most qualitative analysis (i.e. employed the greatest amount of human judgment). An appropriate analogy to sell-side research would be the distinction between a sell (brief report) and a strong-sell rating (full-length report).

An examination of the Firm's operating budget provides additional insight into the amount of effort expended on qualitative analysis vis-à-vis quantitative analysis is an examination of the Firm's operating budget. Over the past three years, approximately 85% (15%) of the Firm's total expenditures on research (other major expenditures are marketing and general corporate expenditures) have been on the qualitative (quantitative) components of the research process. The significantly greater economic cost suggests that there should be a significant incremental benefit from the qualitative research steps.

3.3 Hypotheses

The field setting is exploited to test two hypotheses.

Hypothesis 1 is that the Firm, through its full research process, both quantitative and qualitative, is able to identify companies that underperform the market (i.e. develop an information advantage). In order to test whether the human qualitative analysis component of the Firm's research process provides incremental value, I first establish whether the Firm's combined processes are able to identify companies that subsequently

underperform the market (market returns are used in accordance with the Firm's stated purpose).

Hypothesis 2 is that the second step (human-driven qualitative analysis) provides incremental value beyond the first step (the machine-driven quantitative analysis). The second hypothesis is tested in two steps: (1) the performance of the Firm's quantitative model is tested and (2) the subset of companies selected for publication are tested to determine whether they perform worse than the companies identified by the quantitative screen as future underperformers.

Chapter 4

Methodology, Data, and Results

4.1 Overall Performance of the Firm's Research

Between February 2007 and March 2010 the Firm initiated coverage of 203 companies (the full-publication sample hereinafter). The average number of days a company was actively covered (the active coverage period represents the time between the initiation of coverage and the Firm's decision to closes research coverage) was 163.0 days. Further, the Firm markets its research as the identification and coverage of companies it expects to underperform over a "one- to three-quarter" period. Given the actual average time-period of the Firm's research coverage (between five and six months), this study focuses on a six-month performance period (though three-month and nine-month returns are also presented). Fixed time-periods are used to abstract from any element of market timing that could have impacted the Firm's decisions on when to close research coverage. While the Firm generally closes coverage when the financial statement issues it identified improve and/or become widely-recognized by investors, it is possible that significant stock price moves also impact the Firm's research coverage decisions. In this light, the use of a fixed-time period abstracts from the Firm's market timing skill (in alternative tests, discussed below, a calendar-time portfolio approach uses the actual open coverage period to construct portfolios). An additional consideration in the selection of a performance measurement period was the limitations on the sample size that a twelve-month or longer performance measurement period would have imposed.

It is unlikely that the Firm's clients would pay for its research if the clients believed the Firm was striving to identify companies that would exhibit future

underperformance only in accounting metrics or other metrics that did not manifest in stock returns. As such, the Firm's research process is designed to identify companies that will underperform the market. Accordingly, stock returns are the performance metric used for all of this study's tests. In this study's primary tests, stock performance is measured with time-series mean buy-and-hold size-adjusted returns. Size-adjusted, as opposed to market-adjusted, returns are employed in order to provide comparability to the accrual anomaly research (the bulk of which uses size as the sole risk control). Five size portfolios are constructed based on beginning of month market capitalization values for all firms with sufficient data for the Firm's screens.[10] For each size portfolio, in each month, forward sixth-month returns are calculated for each security and averaged across all the securities in the portfolio. Size-adjusted returns are the difference between a security's return and the size-matched portfolio return in the sixth months following the "event" (the event is the date of the Firm's research coverage initiation on the security).

A second set of tests utilizing a calendar-time portfolio construction approach are conducted for two reasons: (1) to address potential cross-sectional dependence and (2) to assess whether the returns to the full-publication sample and sub-samples are robust to known risk factors. For these tests, beginning with March 2007, monthly portfolios were formed with the companies the Firm had under open research coverage. The portfolio is equal-weighted and rebalanced monthly.[11] Companies entered the portfolio on the date of coverage initiation and exited the portfolio on the date that the Firm closed research

[10] As recommended by Barber, et al. (1999), this construction results in reference portfolios made up of only the companies in the sample being tested.

[11] For example, if the Firm initiated or closed coverage of a company during the middle of a month, the return for the partial month was considered to be the return for the full month. This construction assumes that a position was held in cash for the portion of the month during which a company was not subject to open research coverage by the Firm.

coverage (untabulated results were similar for portfolios constructed with entry and exit dates on the first of the month following initial publication and closure). The portfolio construction resulted in 41 monthly portfolio raw return observations (initiations are from February 2007 through March 2010 and returns are measured from March 2007 through July 2010). These monthly observations were regressed on corresponding monthly portfolio returns to known risk factors or anomalies. The risk model utilized included the traditional Fama-French factors plus momentum (all of the factors used in the tests were provided by Kenneth French's website).[12]

(1) $$RETURN_t - Rf_t = \alpha_0 + \beta_1(Rm - Rf)_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \varepsilon_t$$

Regression (1) was estimated for the full-publication sample as well as the brief and full-length report samples.

In addition, throughout the tests, I leverage the two categories of the Firm's reports, brief and full-length, to examine whether the incremental qualitative analysis performed in the determination of the decision to initiate a full-length report results in the selection of companies that generate more negative stock returns. As discussed above, the Firm's process is such that as additional labor hours are expended on qualitative

[12] Monthly factors provided by http./ mba.tuck.dartmouth.edu/pages faculty/ken.french/data_library html. As defined by Kenneth R. French's website, Rm-Rf is the excess return on the market, which is calculated as the value-weighted return on all NYSE, AMEX, and NASDAQ stocks (from CRSP) minus the one-month Treasury bill rate (from Ibbotson Associates). SMB and HML are constructed using 6 value-weighted portfolios (which are constructed at the end of each June and are the intersections of 2 portfolios formed on size (market equity, ME) and 3 portfolios formed on the ratio of book equity to market equity (BE/ME). The size breakpoint for year t is the median NYSE market equity at the end of June of year t. BE/ME for June of year t is the book equity for the last fiscal year end in t-1 divided by ME for December of t-1. The BE/ME breakpoints are the 30th and 70th NYSE percentiles. SMB (Small Minus Big) is the average return on the three small portfolios minus the average return on the three big portfolios (1/3 (Small Value + Small Neutral + Small Growth) - 1/3 (Big Value + Big Neutral + Big Growth)). HML (High Minus Low) is the average return on the two value portfolios minus the average return on the two growth portfolios (1/2 (Small Value + Big Value) - 1/2 (Small Value + Big Value)). MOM is constructed and calculated in the same fashion as HML but with six value-weighted portfolios formed on size and prior (2-12) returns.

research, it often elects to forgo publication on a name. As a result, the companies that survive the most analysis typically are covered in full-length reports. Because the full-length reports represent research ideas that have been the most heavily-scrutinized, the Firm has a higher level of conviction that the companies covered in these reports will underperform. The 203 firm full-publication sample includes 122 brief reports and 81 full-length reports.

Table 1 provides descriptive statistics of the full-publication sample and the two sub-samples. Consistent with the Firm's internal mandate to provide research coverage of large, liquid companies with low short interest, the mean average daily trading volume, price-per-share, market capitalization, and short interest as a percentage of float for the full-publication sample was $47.42 million, $41.01, $5.57 billion, and 4.44%, respectively. The full-length and brief reports had similar characteristics. On average, the full-length reports covered companies with slightly greater market capitalizations ($6.11 billion vis-à-vis $5.22 billion for the brief report sample), slightly lower short interest (3.84% vis-à-vis 4.83%), slightly lower three-year sales growth (12.59% vis-à-vis 14.64%), and slightly higher valuations (3.41 market-to-book and 23.77 market value/net income vis-à-vis 3.11 and 21.69).

The average raw return (size-adjusted return) in the six months following the 203 initiations was -5.41% (-4.43%). The size-adjusted returns were significantly different from zero at the 0.01 significance level based on a two-sided t-test (see Table 2). The average six-month size-adjusted return to the brief report sample (full-length report sample) was -2.52% (-7.30%). While lower on average, the average six-month size adjusted return in the full-length report sample was not statistically different from either

TABLE 2

Size-Adjusted Returns to Publication Firms

Panel A: Full-publication sample

	Mean	p-value	# of obs
Three-month size adjusted returns	-0.0155	0.0318*	203
Six-month size adjusted returns	-0.0443	0.0050*	203
Nine-month size adjusted returns	-0.0629	0.0076*	203

Panel B: Brief report sample

	Mean	p-value	# of obs
Three-month size adjusted returns	-0.0133	0.1191*	122
Six-month size adjusted returns	-0.0252	0.0977*	122
Nine-month size adjusted returns	-0.0436	0.0083*	122

Panel C: Full-length report sample

	Mean	p-value	# of obs
Three-month size adjusted returns	-0.0189	0.0245*	81
Six-month size adjusted returns	-0.0730	0.0011*	81
Nine-month size adjusted returns	-0.0922	0.0049*	81

TABLE 2, continued

Panel D: Difference between brief and full-length reports

	Mean	p-value	# of obs
Three-month size adjusted returns	-0.0042	0.9318**	--
Six-month size adjusted returns	-0.0479	0.4195**	--
Nine-month size adjusted returns	-0.0490	0.4484**	--

*represents the difference from zero in a standard two-sided t-test.
**represents the t-test of the difference of means.
Returns are time-series mean annual buy-and-hold size-adjusted returns. Five size portfolios were constructed based on beginning of month market capitalization values for all firms with sufficient data for the Firm's screens. For each size portfolio three-month, sixth-month, and nine-month returns were calculated for each security and averaged across all the securities in the portfolio. Size-adjusted returns are the difference between a firm's return and the size-matched portfolio.

the full-publication or brief report samples (based on a two-sided difference of means t-test). While the publication sample generated size-adjusted returns significantly lower than zero, there is no statistically significant evidence that the full-length report sample performs worse than the brief report sample. This result will change for calendar-time returns.

The results from the estimation of regression (1) are presented in Table 3. For the full sample, the intercept (α_0), which represents the mean monthly risk-adjusted return, was -0.0104 (or -1.0%), and was significant at the .01 level. The brief report (full-length report) samples yielded intercepts (α_0) of -0.0061 (-0.0181). The intercept was significant at the .10 level for the brief report sample, while the intercept for the full-length report sample was significant at the .01 level. The difference in the intercepts between the brief report and full-length report samples was significant at the .10 level. In the full-publication sample and the two sub samples, the HML and momentum factors did not load as expected (β_3 and β_4 were negative, though not statistically significant). As discussed in detail below, the quantitative sample (section 4.2) test results and other recent results from the literature cast doubt on the Fama-French plus momentum approach's utility as a risk model during this study's time period.

Taken as a whole, the statistically significant risk-adjusted returns to the full-publication sample in both the event-time and calendar-time tests supports hypothesis 1 (that the Firm through its full research process, both quantitative and qualitative, is able to identify companies that underperform the market). While the evidence is mixed (the event-time size-adjusted return tests did not yield a significant difference between the brief and full-length reports), the calendar-time results suggest there is an incremental

TABLE 3
Calendar-Time Portfolio Returns to Publication Firms

	alpha (α_0)	Rm-Rf coefficient (β_1)	SMB coefficient (β_2)	HML coefficient (β_3)	Momentum coefficient (β_4)	# of obs
Full publication sample	-0.0104	0.0096	0.0056	-0.0017	-0.0005	203
p-value	0.0027	<0.0001	0.0005	0.1945	0.3215	41
Brief report sample	-0.0061	0.0089	0.0047	-0.0009	-0.0006	122
p-value	0.0913	<0.0001	0.0059	0.5088	0.2789	41
Full-length report sample	-0.0181	0.0109	0.0073	-0.0030	-0.0001	81
p-value	0.0022	<0.0001	0.0060	0.1645	0.9009	41
Difference in α_0 between brief and full-length	-0.0116					
p-value	0.0719					

The p-values are based on two-tailed Fama-McBeth t-statistics computed over 41 monthly mean returns and the standard deviation of these 41 observations. For these tests, beginning with March 2007, monthly portfolios are formed with the companies the Firm had under open research coverage. The portfolio is equal-weighted and rebalanced monthly. Companies entered the portfolio on the date of coverage initiation and exited the portfolio on the date that the Firm closed research coverage. The portfolio construction resulted in 41 monthly portfolio raw-return observations (initiations are from February 2007 through March 2010 and returns are measured from March 2007 through July 2010). These monthly observations are regressed on corresponding monthly portfolio returns to known risk factors or anomalies. The risk model chosen ($RET_t - Rf_t = \alpha_0 + \beta_1*(Rm\text{-}Rf)_t + \beta_2*SMB_t + \beta_3*HML_t + \beta_4*SMB_t + \beta_5*MOM_t + \varepsilon_t$) includes the traditional Fama-French factors plus momentum (all of the factors used in the tests were provided by Kenneth French's website). Monthly factors provided by http://mba.tuck.dartmouth.edu/ pages/faculty/ken.french/data_library.html. As defined by Kenneth French's website, Rm-Rf is the excess return on the market, which is calculated as the value-weight return on all NYSE, AMEX, and NASDAQ stocks (from CRSP) minus the one-month Treasury bill rate (from Ibbotson Associates). SMB and HML are constructed using 6 value-weighted portfolios (which are constructed at the end of each June and are the intersections of 2 portfolios formed on size (market equity, ME) and 3 portfolios formed on the ratio of book equity to market equity (BE/ME). The size breakpoint for year t is the median NYSE market equity at the end of June of year t. BE/ME for June of year t is the book equity for the last fiscal year end in t-1 divided by ME for December of t-1. The BE/ME breakpoints are the 30th and 70th NYSE percentiles. SMB (Small Minus Big) is the average return on the three small portfolios minus the average return on the three big portfolios (1/3 (Small Value + Small Neutral + Small Growth) - 1/3 (Big Value + Big Neutral + Big Growth)). HML (High Minus Low) is the average return on the two value portfolios minus the average return on the two growth portfolios (1/2 (Small Value + Big Value) - 1/2 (Small Value + Big Value)). MOM is constructed and calculated in the same fashion as HML but with six value-weighted portfolios formed on size and prior (2-12) returns.

benefit to the Firm's qualitative research labor hours (i.e. the sell recommendations that survive the most scrutiny, or qualitative research labor hours, underperform by the greatest amount).

4.2 Performance of the Firm's Quantitative Model

The next series of tests examine the performance of the Firm's quantitative model. While the performance of the Firm's quantitative model is not a primary focus of this research, its performance is established in order to serve as a benchmark such that the qualitative component of the Firm's research process can be isolated (in section 4.3). As described heretofore, the Firm uses an internally developed, proprietary model to identify publication candidates. The model, which is run once per month, generates an output of VER scores (Voyant Earnings Risk Assessment Scores). One of the primary factors used in the model is a trailing twelve-month version of percent accruals (as in Hafzalla, et al. 2010); accordingly, this metric is tested along with the Firm's quantitative model for comparison purposes.[13]

The dataset for these tests consists of the output from 38 monthly quantitative model runs (from February 2007 through March 2010). Various Reuters Global Fundamentals, Factset, and Compustat databases are accessed by the quantitative model to generate the monthly VER scores. The quantitative model was calculated with data available as of the first of each month in the sample period, and it computes scores on all companies with (1) sufficient data, (2) their primary listing on the NYSE or the NASDAQ Stock Market, (3) market capitalization greater than $500 million, and (4) short interest as a percentage of float less than 15%. Tables 4 and 5 present descriptive

[13] The metric used is calculated as: trailing twelve-month net income less cash from operations/the absolute value of trailing twelve-month net income.

TABLE 4
Quantitative Screen Sample Descriptive Statistics

Variable	Mean	Median	Standard Deviation	Lower Quartile	Upper Quartile
Traditional operating accruals	-0.0579	-0.0473	0.0745	-0.0833	-0.0198
Percent accruals	-1.6257	-0.7607	3.0127	-1.6854	-0.2618
Earnings Risk Assessment score (VER)	27.18	25.00	16.60	15.00	37.50
Market value of equity	10,676.29	2,945.46	26,451.72	1,499.71	8,007.20
Return on assets	6.72%	6.17%	9.93%	2.86%	10.64%
Market value/book value	3.42	2.64	2.43	1.72	4.30
Market value/net income	23.98	18.97	16.24	13.47	28.17
Price per share	37.23	30.68	34.56	19.95	45.39
Three-year sales growth %	16.74%	12.86%	16.48%	6.11%	25.18%
Short interest as a % of float	6.56%	4.73%	6.16%	2.16%	9.04%

The sample period is February 2007 - March 2010, consisting of 49,985 firm-months. Traditional operating accruals are defined as net income less cash from operations during the most recently disclosed trailing twelve month period divided by average total assets over the same twelve-month period. Percent accruals has the same numerator as operating accruals, but the denominator is the absolute value of trailing twelve-month net income. Return on assets is trailing twelve-month net income divided by average total assets. VER score, market value of equity, price-per-share, and short interest as a % of float are measured at the beginning of the quantitative screening month. Book value is measured at the most recent fiscal quarter. Three-year sales growth is the average annual sales growth in the three most recent fiscal years. Variables other than VER score and short interest as a % of float are winsorized at the 1 percent and 99 percent for this table and Table 2 only. VER score and short interest as a % of float are not winsorized.

TABLE 5
Descriptive Statistics of Quantitative Screen Sample by Quintile

Panel A:

Deciles sorted by operating accruals	1	2	3	4	5	6	7	8	9	10
Mean traditional operating accruals	-0.1085	-0.1032	-0.0964	-0.0905	-0.0803	-0.0651	-0.0453	-0.0312	-0.0070	0.0490
Mean percent accruals	-8.9817	-2.7726	-1.7221	-1.2403	-0.9238	-0.6796	-0.4699	-0.2805	-0.0551	0.8444
Mean Earnings Risk Assessment score (VER)	23.53	23.50	23.82	23.75	24.52	24.41	25.50	28.33	31.49	42.98
Mean market value of equity	5,841	7,829	8,465	10,173	10,977	11,796	14,758	16,560	13,527	6,803
Mean return on assets	1.54%	1.94%	2.99%	4.75%	5.71%	7.76%	9.35%	11.04%	12.58%	9.55%
Mean market value/book value	2.85	2.76	2.95	3.11	3.25	3.53	3.83	4.08	4.17	3.70
Mean market value/net income	41.53	28.93	25.88	24.03	22.14	21.14	20.51	20.17	20.21	21.94
Mean price-per-share	31.13	31.01	32.09	35.01	36.47	39.26	42.07	45.71	42.37	37.15
Mean three-year sales growth %	18.88%	15.28%	15.39%	15.09%	15.64%	14.86%	15.70%	16.85%	19.03%	20.66%
Mean short interest as a % of float	7.18	7.13	6.79	6.69	6.54	6.16	5.91	5.86	6.01	7.49

Panel B:

Deciles sorted by VER	1	2	3	4	5	6	7	8	9	10
Mean traditional operating accruals	-0.0795	-0.0769	-0.0710	-0.0661	-0.0620	-0.0610	-0.0535	-0.0500	-0.0445	-0.0142
Mean percent accruals	-2.0971	-2.1383	-2.0717	-1.8300	-1.7262	-1.7753	-1.4895	-1.3905	-1.1999	-0.5378
Mean Earnings Risk Assessment score (VER)	3.50	10.16	14.90	19.06	23.07	27.24	31.82	37.22	44.63	60.13
Mean market value of equity	13,506	12,168	11,714	11,727	11,907	10,651	10,435	8,219	8,744	7,714
Mean return on assets	7.39%	6.79%	6.73%	6.66%	6.87%	6.41%	6.44%	6.17%	6.41%	7.36%
Mean market value/book value	3.42	3.42	3.43	3.41	3.43	3.48	3.38	3.31	3.36	3.58
Mean market value/net income	23.54	22.90	23.24	23.98	23.89	24.29	24.15	24.40	24.52	24.92
Mean price-per-share	42.31	36.95	38.77	37.27	37.08	36.57	36.67	35.07	35.87	35.80
Mean three-year sales growth %	15.28%	15.52%	15.23%	15.95%	16.23%	16.19%	16.52%	17.15%	18.36%	20.93%
Mean short interest as a % of float	6.62	6.47	6.47	6.43	6.35	6.32	6.76	6.64	6.68	6.88

TABLE 5, continued

The sample period is February 2007-March 2010, consisting of 49,985 firm-months. Traditional operating accruals are defined as net income less cash from operations during the most recently disclosed trailing twelve month period divided by average total assets over the same twelve-month period. Percent accruals has the same numerator as operating accruals, but the denominator is the absolute value of trailing twelve-month net income. Return on assets is trailing twelve-month net income divided by average total assets. VER score, market value of equity, price-per-share, and short interest as a % of float are measured at the beginning of the quantitative screening month. Book value is measured at the most recent fiscal quarter. Three-year sales growth is the average annual sales growth in the three most recent fiscal years. Variables other than VER score and short interest as a % of float are winsorized at the 1 percent and 99 percent for this table and Table 1 only. VER score and short interest as a % of float are not winsorized.

statistics of the quantitative screen sample which is comprised of 49,985 firm-months. Of note, the characteristics of the 203 full-publication sample (122 brief reports, 81 full-length reports) discussed heretofore are similar to the quantitative screen sample from which the publication companies were selected. The mean market cap of companies in the full-publication (quantitative screen) sample was $5.6 billion ($10.7 billion). However the median market caps were similar, $3.3 billion ($2.9 billion) for the full-publication (quantitative screen) sample. The difference in mean market cap reflects the fact that the Firm rarely publishes on mega-cap companies (e.g. Exxon Mobil Corporation, General Electric Company, etc). The full-publication and quantitative screen samples had comparable valuation and financial performance (i.e. return on assets and sales growth) characteristics. As the full-publication sample results from the selection of the top quintile of VER score (and VER score includes various accruals metrics), the full-publication sample had higher average VER scores as well as higher percent accruals and operating accruals. Another notable difference is the higher level of average short interest in the quantitative screen sample (6.56% for the quantitative screen sample versus 4.44% for the full-publication sample).

The first set of tests conducted on the VER scores and percent accruals are event-time tests with three-, six-, and nine-month size-adjusted returns (similar to the tests conducted on the full-publication sample that are shown in Table 2). All of the variables used to calculate VER scores by the quantitative model are measured quarterly. Accordingly, there is significant overlap in the quantitative screen sample data set (i.e. companies' VER scores change once every three months on average, so the same firm/VER score pairs often repeat in adjacent months). When future returns (over

periods longer than a month) are calculated for each observation, the frequency of repeat observations in successive months combined with partially overlapping return periods imparts serial correlation in the data. In order to address both the normal cross-sectional correlation inherent in stock returns data and the serial correlation resulting from the construction of the dataset, a Newey-West adjustment was used to compute Fama-MacBeth t-statistics. Specifically, the t-statistic was computed based on the average of 38 monthly mean size-adjusted returns in each quintile and the Newey-West standard deviation of the 38 monthly means.[14]

Before testing the Firm's quantitative model, I examine whether percent accruals, was correlated with future returns in the quantitative screen sample. The Pearson correlation between percent accruals and VER scores was .1640 during the sample period (significant at the .0001 level, see Table 6). This correlation was expected given that percent accruals is one of the variables used in the Firm's quantitative model and a significant portion of the factors in the model are variations of specific accruals that are components of the numerator in percent accruals.

The results are tabulated in Panel A of Table 7 (untabulated results were consistent for other common accruals measures, including traditional operating accruals as defined in Sloan, 1996). The six-month, size-adjusted returns to quintile 5 (the highest operating accrual firms) were -1.7% (significantly different from zero at the .10 significance level based on the Newey-West adjusted Fama-MacBeth t-statistic). In addition, the three-month, size-adjusted returns (-1.3%) and the nine-month, size-adjusted returns (-2.4%) were significant at the .10 level and the .05 level, respectively. While the

[14] In the six-month return window, for example, five lags are assumed to have non-zero correlation in the Newey-West standard deviation estimation procedure.

TABLE 6
Pearson (above diagonal)/Spearman (below diagonal) Correlation Table for Quantitative Screen Sample

	Trad. op. accruals	Percent accruals	VER	Market value of equity	Return on assets	Market/ book	Market/ net income	Price-per-share	Three-year sales growth	Short interest
Mean traditional operating accruals		0.3911	0.2671	0.0247	0.2950	0.0133	-0.0836	0.0908	0.0376	-0.0330
		<.0001	<.0001	<.0001	<.0001	0.0021	<.0001	<.0001	<.0001	<.0001
Mean percent accruals	0.7704		0.1640	0.0611	0.2306	0.1198	-0.3118	0.0781	0.0022	-0.0225
	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.5999	<.0001
Mean Earnings Risk Assessment score (VER)	0.3160	0.2744		-0.0676	0.0089	0.0223	0.0378	-0.0371	0.1126	0.0263
	<.0001	<.0001		<.0001	0.0379	<.0001	<.0001	<.0001	<.0001	<.0001
Mean market value of equity	0.0194	0.0589	-0.0812		0.0926	0.0641	-0.0829	0.1950	-0.0544	-0.2263
	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Mean return on assets	0.1774	0.5116	-0.0324	0.1487		0.2727	-0.2615	0.1432	0.0809	-0.0053
	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	0.2514
Mean market value/book value	0.01683	0.2408	-0.0083	0.1185	0.4144		0.2996	0.1703	0.1606	0.0776
	0.0001	<.0001	0.0556	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001
Mean market value/net income	-0.08555	-0.1861	0.0054	-0.0876	-0.2958	0.3992		0.0636	0.1831	0.1159
	<.0001	<.0001	0.2393	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001
Mean price-per-share	0.15083	0.1989	-0.0413	0.3621	0.2775	0.3020	0.1110		0.0584	-0.0671
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001
Mean three-year sales growth %	0.05183	0.1076	0.0951	-0.1031	0.1632	0.1781	0.1344	0.0850		0.0855
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001
Mean short interest as a % of float	-0.05199	-0.0382	0.0192	-0.5060	-0.0527	0.0304	0.1386	-0.1414	0.0876	
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	

The sample period is February 2007-March 2010, and consists of 49,985 firm-months. Traditional operating accruals are defined as net income less cash from operations during the most recently disclosed trailing twelve month period divided by average total assets over the same twelve-month period. Percent accruals has the same numerator as operating accruals, but the denominator is the absolute value of trailing twelve-month net income. Return on assets is trailing twelve-month net income divided by average total assets. VER score, market value of equity, price-per-share, and short interest as a % of float are measured at the beginning of the quantitative screening month. Book value is measured at the most recent fiscal quarter. Three-year sales growth is the average annual sales growth in the three most recent fiscal years. Variables other than VER score and short interest as a % of float are winsorized at the 1 percent and 99 percent for this table and Table 2 only. VER score and short interest as a % of float are not winsorized.

TABLE 7

Mean Size-adjusted Returns to Percent Accruals and Earnings Risk Assessment Scores

Panel A: Percent accruals

Quintile	Three-month size-adjusted return	p-value	Six-month size-adjusted return	p-value	Nine-month size-adjusted return	p-value	# of obs
1	0.0026	0.6343	0.0079	0.3470	0.0050	0.3635	9,983
2	0.0058	0.2619	0.0094	0.1021	0.0070	0.1829	10,006
3	0.0040	0.7398	0.0053	0.9043	0.0081	0.4439	10,003
4	0.0012	0.8935	0.0004	0.9706	0.0033	0.7420	10,006
5	-0.0130	0.0640	-0.0168	0.0725	-0.0235	0.0382	9,987
Q1 - Q5	0.0156	0.0744	0.0247	0.0864	0.0285	0.0326	N/A

Panel B: Earnings Risk Assessment scores (VER)

Quintile	Three-month size-adjusted return	p-value	Six-month size-adjusted return	p-value	Nine-month size-adjusted return	p-value	# of obs
1	0.0095	0.1108	0.0092	0.2782	0.0159	0.2104	9,967
2	0.0059	0.0946	0.0075	0.1195	0.0067	0.3239	10,019
3	-0.0002	0.9832	0.0033	0.2349	0.0036	0.8348	9,989
4	-0.0043	0.1580	-0.0072	0.0950	-0.0082	0.1243	10,021
5	-0.0109	0.0489	-0.0128	0.1067	-0.0180	0.0719	9,989
Q1 - Q5	0.0204	0.0853	0.0220	0.1631	0.0339	0.0945	N/A

TABLE 7, continued

Panel C: Test of difference between percent accruals and VER scores

Quintile	Three-month size-adjusted return	p-value	Six-month size-adjusted return	p-value	Nine-month size-adjusted return	p-value	# of obs
1	0.0069	0.4094	0.0013	0.9657	0.0109	0.0843	38
5	0.0021	0.6135	0.0040	0.6250	0.0055	0.4345	38
Q1 - Q5	0.0048	0.2223	-0.0027	0.8406	0.0054	0.5190	38

Returns are the time-series mean annual buy-and-hold size-adjusted returns. Five size portfolios were constructed based on beginning of month market capitalization values for all firms with sufficient data for the Firm's quantitative screen. For each size portfolio sixth-month returns were calculated for each security and averaged across all the securities in the portfolio. Size-adjusted returns are the difference between a firm's six month return and the size-matched portfolio. The p-values are based on two-tailed Fama-McBeth, Newey-West adjusted t-statistics computed over the 38 monthly mean returns in a quintile and the standard deviation of these 38 observations.

size-adjusted returns to quintile 1 were positive, directionally consistent with Hafzalla, et al., they were not significantly different from zero at any standard level over any of the measurement periods. The difference between quintile 1 and 5 was 2.5% over the six-month measurement period (significantly different from zero at the .10 level). The difference between quintile 1 and 5 was also significantly different from zero for the three-month (1.6%) and nine-month (3.3%) measurement periods. I suspect that the mixed results (no significance on the long side of the portfolio) were a function of the relatively short sample period and the unique features of the US equity markets during the sample period (February 2007 – March 2010). Firms with the poorest operating cash flow, as well as firms with other characteristics typically associated with poor financial health, outperformed the market during a significant portion of the sample period (as documented in Green et al., 2009).

The results to quintile portfolios sorted by VER scores are presented in Panel B of Table 7. While the purpose of this research is to assess the ability to identify future underperformance, given that the quant model incorporates several variables that researchers have shown to generate returns on both sides of a hedge portfolio, I expect that firms with the lowest VER scores will exhibit positive size-adjusted returns over the one- to three-quarter period following measurement. Directionally, the returns are as expected. However, the six-month, size-adjusted returns in quintile 1, quintile 5, and for the difference between quintiles 1 and 5 were not significantly different from zero at standard levels (the size-adjusted returns were -1.3% in quintile 5 with a p-value of 0.1067 based on the Newey-West, Fama-MacBeth procedure). However, the three-month (-1.1%) and nine-month (-1.8%) windows for quintile 5 yielded significant size-

adjusted returns significantly different from zero at the .05 and .10 levels, respectively. The difference in size-adjusted returns between quintile 1 and 5 for the three-month (nine-month) window was 2.0% (3.4%), both significant at the .10 level.

Similarly specified tests (using the 38 monthly observations) of the difference between the size-adjusted returns of percent accruals and VER scores in quintile 1, quintile 5, and quintile 1 minus quintile 5 suggest there was no significant difference between the two metrics' ability to identify underperformance or outperformance (these results are tabulated in Table 7, panel C).

As in the tests of the publication samples in section 4.1, a second set of tests utilizing calendar-time portfolios and a Fama-French plus momentum risk model were conducted. Forty-one monthly portfolios (March 2007 through July 2010) are formed for each quintile of VER scores and percent accruals.[15] The portfolios are formed based on the scores calculated in the month prior to portfolio formation and companies remained in portfolios until their quintile rank changed. When a company's quintile rank changed, it was moved into the new quintile in the month following the measurement period that resulted in the score change.[16] The results of these tests were tabulated in Table 8. As in the tests of the publication samples, the intercept, or alpha (α_0), represents risk-adjusted returns. Overall, the results suggest that neither percent accruals nor VER scores were associated with future risk-adjusted returns during the sample period. Alpha was not significantly different from zero in any of the quintiles for either variable. The only

[15] The 38 underlying quantitative screen runs were kept consistent for these tests. The difference in observation count is due to the return accumulation period (one month versus three, six, and nine months). Accordingly, for the calendar-time tests of the quantitative screens, the number of individual company observations in the portfolios declined between April 2010 and July 2010 (as the last screen was run in March 2010).

[16] Under this portfolio construction method, companies can only be in the same month once. A company is moved to a new portfolio when its rank changes (it then remains in that portfolio until its score changes again.)

TABLE 8

Calendar-Time Portfolio Returns to Percent Accruals and Earnings Risk Assessment Scores

Panel A: Percent accruals

Quintile	alpha (α_0)	Rm-Rf coefficient (β_1)	SMB coefficient (β_2)	HML coefficient (β_3)	Momentum coefficient (β_4)	# of obs
1	0.0020	0.0126	0.0039	-0.0020	-0.0012	41
p-value	0.5738	<0.0001	0.0193	0.1393	0.0312	
2	0.0024	0.0115	0.0026	-0.0007	-0.0005	41
p-value	0.4439	<0.0001	0.0731	0.5128	0.2946	
3	0.0021	0.0112	0.0030	-0.0008	-0.0002	41
p-value	0.5169	<0.0001	0.0507	0.5405	0.6693	
4	0.0017	0.0111	0.0021	-0.0018	-0.0004	41
p-value	0.5971	<0.0001	0.1559	0.1365	0.4391	
5	-0.0005	0.0136	0.0022	-0.0037	-0.0012	41
p-value	0.9049	<0.0001	0.2092	0.0157	0.0413	
Q1 - Q5	0.0023	-0.0008	0.0024	0.0012	0.0001	41
p-value	0.3310	0.0844	0.0247	0.1756	0.7349	

Panel B: Earnings Risk Assessment scores (VER)

Quintile	alpha (α_0)	Rm-Rf coefficient (β_1)	SMB coefficient (β_2)	HML coefficient (β_3)	Momentum coefficient (β_4)	# of obs
1	0.0030	0.0112	0.0026	-0.0003	-0.0004	41
p-value	0.3708	<0.0001	0.0993	0.8430	0.4896	
2	0.0023	0.0120	0.0028	-0.0017	-0.0002	41
p-value	0.4913	<0.0001	0.0720	0.1987	0.6542	
3	0.0030	0.0120	0.0022	-0.0018	-0.0010	41
p-value	0.3331	<0.0001	0.1153	0.1431	0.0502	
4	0.0006	0.0121	0.0032	-0.0024	-0.0009	41
p-value	0.8581	<0.0001	0.0349	0.0640	0.0733	
5	-0.0012	0.0127	0.0029	-0.0032	-0.0011	41
p-value	0.7202	<0.0001	0.0700	0.0214	0.0423	
Q1 - Q5	0.0039	-0.0012	0.0006	0.0024	0.0008	41
p-value	0.0277	0.0005	0.4649	0.0006	0.0032	

TABLE 8, continued

Panel C: Test of difference between percent accruals and VER scores

Quintile	Alpha (α_0)	p-value	# of obs
1	-0.0003	0.9049	41
5	0.0002	0.9038	41
Q1 - Q5	-0.0004	0.8675	41

The samples are as in Table 4.

The p-values are based on two-tailed Fama-McBeth t-statistics computed over 41 monthly mean returns and the standard deviation of these 41 observations. For these tests, beginning with March 2007, monthly portfolios are formed with the companies the Firm had under open research coverage. The portfolio is equal-weighted and rebalanced monthly. Companies entered the portfolio on the date of coverage initiation and exited the portfolio on the date that the Firm closed research coverage. The portfolio construction resulted in 41 monthly portfolio raw-return observations (initiations are from February 2007 through March 2010 and returns are measured from March 2007 through July 2010). These monthly observations are regressed on corresponding monthly portfolio returns to known risk factors or anomalies. The risk model chosen ($RET_t - Rf_t = \alpha_0 + \beta_1*(Rm\text{-}Rf)_t + \beta_2*SMB_t + \beta_3*HML_t + \beta_4*SMB_t + \beta_5*MOM_t + \varepsilon_t$) includes the traditional Fama-French factors plus momentum (all of the factors used in the tests were provided by Kenneth French's website). Monthly factors provided by http://mba.tuck.dartmouth.edu/pages/ faculty/ken.french/ data_library.html. As defined by Kenneth French's website, Rm-Rf is the excess return on the market, which is calculated as the value-weight return on all NYSE, AMEX, and NASDAQ stocks (from CRSP) minus the one-month Treasury bill rate (from Ibbotson Associates). SMB and HML are constructed using 6 value-weighted portfolios (which are constructed at the end of each June and are the intersections of 2 portfolios formed on size (market equity, ME) and 3 portfolios formed on the ratio of book equity to market equity (BE/ME). The size breakpoint for year t is the median NYSE market equity at the end of June of year t. BE/ME for June of year t is the book equity for the last fiscal year end in t-1 divided by ME for December of t-1. The BE/ME breakpoints are the 30th and 70th NYSE percentiles. SMB (Small Minus Big) is the average return on the three small portfolios minus the average return on the three big portfolios (1/3 (Small Value + Small Neutral + Small Growth) - 1/3 (Big Value + Big Neutral + Big Growth)). HML (High Minus Low) is the average return on the two value portfolios minus the average return on the two growth portfolios (1/2 (Small Value + Big Value) - 1/2 (Small Value + Big Value)). MOM is constructed and calculated in the same fashion as HML but with six value-weighted portfolios formed on size and prior (2-12) returns.

statistically significant result was the difference between the VER score quintile 1 and quintile 5. This difference was 0.4% and was significantly different from zero at the .05 level. In addition, the differences between the VER score and the percent accruals alphas were not statistically significant for quintile 1, quintile 5, or the difference between quintile 1 and quintile 5.

Some observations about the results from the risk model regressions merit discussion. The factor loadings for Rm-Rf (β_1) and SMB (β_2) were positive (as expected) and significantly different from zero in most quintiles. However, the HML (β_3) and Momentum (β_4) coefficients were generally negative. In particular, both of these factors were significantly negatively correlated with the returns to companies in quintile 5 of both percent accruals and VER scores. While not expected, these results are not unique to this study. Hirshleifer et al. (2010) documents negative correlation between HML and the returns to large firms with high levels of operating accruals relative to total assets (sample characteristics shared by quintile 5 of both percent accruals and VER score) over a long time-period (1967 to 2005). In addition, Brunnermeier (2009) and Khandani and Lo (2010) provide evidence that well-documented risk and/or trading anomalies performed oppositely of their expected directions during the equity market turmoil of 2007 and 2008.

Taken as a whole, the VER score tests do not provide conclusive evidence that Firm's quantitative model was able to identify companies that generated significantly negative risk-adjusted returns in future three-, six-, and nine-month periods. The similar results from the parallel tests of percent accruals, along with results from other recent research (Green et al., 2009 and Soliman et al., 2009), suggest accounting-based trading

anomalies that generated significant abnormal returns over longer historical periods, did not perform as well during the sample period. Further examination of why the Firm's quantitative model and/or other accounting-based quantitative strategies did not perform well during 2007 through 2010 is beyond the scope of this study (the performance of VER score was tested in order to establish a benchmark to measure the performance of the Firm's qualitative analysis against).

4.3 Performance of the Firm's Qualitative Analysis

In order to assess the incremental contribution of the qualitative component of the Firm's research process, size-adjusted returns to the full-publication sample (-4.4% over six months) are compared to the size-adjusted returns to quintile 5 of the VER scores (-1.3% over six months). To begin, I simply examine whether the Firm's full research process identifies losers (defined as companies that exhibit negative size-adjusted returns in subsequent periods) more frequently that its quantitative model does on its own. In this light, a series of non-parametric tests (difference of proportion) are presented in Table 9, Panel A. Of the 9,989 firms in Quintile 5 of VER scores, 54.8%, or 5,472, had negative size-adjusted returns in the next six months. Of the 203 (81) firms in the full-publication sample (full-length report sample) 61.1%, or 124 (66.7%, or 54) generated negative size-adjusted returns in the sixth-month period following the model run that resulted in their selection for publication. The proportion of firms experiencing negative size-adjusted returns in the 203-firm full-publication sample (the 81-firm full-length report sample) were significantly different from the proportion of firms in VER quintile 5 with negative

TABLE 9

Incremental Returns to Qualitative Analysis

Panel A: Proportion tests

	Full-publication sample	Full-length report sample	VER quintile 5
Proportion of negative three-month size-adjusted returns	0.5813	0.6173	0.5214
p-value (difference between VER Q5 and publication sample)	0.0971	0.0878	--
Proportion of negative six-month size-adjusted returns	0.6108	0.6670	0.5478
p-value (difference between VER Q5 and publication sample)	0.0798	0.0331	--
Proportion of negative nine-month size-adjusted returns	0.6552	0.6790	0.5883
p-value (difference between VER Q5 and publication sample)	0.0597	0.1010	--
# of obs	203	81	3,330

Brief reports represent shorter publications on names where the Firm assessed a relatively lower level of underperformance risk (these reports are generally four to six pages in length and require approximately 50 man-hours to complete). Full-length reports represent reports on the companies which the Firm believed were subject to the highest risk of underperformance (these reports are generally twelve to twenty pages in length and require approximately 120 man-hours).

The number of observations used for the VER quintile 5 sample size was divided by 3 to reflect the fact that most firms repeat in the sample for 3 consecutive months because the variables used to calculate VER are based on quarterly financial statement data.

Returns are the time-series mean annual buy-and-hold size-adjusted returns. Five size portfolios were constructed based on beginning of month market capitalization values for all firms with sufficient data for the Firm's screens. For each size portfolio, returns were calculated for each security and averaged across all the securities in the portfolio. Size-adjusted returns are the difference between a firm's return and the size-matched portfolio.

TABLE 9, continued

Panel B: Difference between VER Quintile 5 and Publication Sample Returns

	Intercept (α_0)	Indicator (β_1)	Earnings Risk Assessment Score (VER, β_2)
Mean three-month size-adjusted return	0.0210	-0.0283	-0.0003
p-value	0.1843	0.0634	0.0042
Mean six-month size-adjusted return	0.0566	-0.0508	-0.0010
p-value	0.0010	0.0039	0.0012
Mean nine-month size-adjusted return	0.0345	-0.0812	-0.0014
p-value	0.0834	0.0025	0.0009
# of obs	9,989	203	--

The p-value is based on a t-test of the 38 monthly coefficients on an indicator variable, representing 1 if a firm-month was selected for publication and 0 if the firm-month was not selected, in the following regression, which is estimated monthly from January 2007 through March 2010: size-adjusted return$_{it}$ = $\alpha_0 + \beta_1$*IND$_{it} + \beta_2$*VER$_{it} + \varepsilon_{it}$. VER is the VER score from the month during which firm i was identified by the quantitative screen.

Returns are the time-series mean annual buy-and-hold size-adjusted returns. Five size portfolios were constructed based on beginning of month market capitalization values for all firms with sufficient data for the Firm's screens. For each size portfolio returns were calculated for each security and averaged across all the securities in the portfolio. Size-adjusted returns are the difference between a firm's return and the size-matched portfolio.

TABLE 9, continued

Panel C: Calendar-time portfolio tests

	VER quintile 5	Full publication sample	Full-length report sample	# of obs
Monthly alphas	0.0004	-0.0090	-0.0167	41
p-value (difference from VER quintile 5)	--	0.1351	0.0194	41
# of obs	--	203	81	--

The p-values are based on two-tailed Fama-McBeth t-statistics computed over 41 monthly mean returns and the standard deviation of these 41 observations. For these tests, beginning with March 2007, monthly portfolios are formed with the companies the Firm had under open research coverage. The portfolio is equal-weighted and rebalanced monthly. Companies entered the portfolio on the date of coverage initiation and exited the portfolio on the date that the Firm closed research coverage. The portfolio construction resulted in 41 monthly portfolio raw-return observations (initiations are from February 2007 through March 2010 and returns are measured from March 2007 through July 2010). These monthly observations are regressed on corresponding monthly portfolio returns to known risk factors or anomalies. The risk model chosen ($RET_t - Rf_t = \alpha_0 + \beta_1*(Rm\text{-}Rf)_t + \beta_2*SMB_t + \beta_3*HML_t + \beta_4*SMB_t + \beta_5*MOM_t + \varepsilon_t$) includes the traditional Fama-French factors plus momentum (all of the factors used in the tests were provided by Kenneth French's website). Monthly factors provided by http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/ data_library.html. As defined by Kenneth French's website, Rm-Rf is the excess return on the market, which is calculated as the value-weight return on all NYSE, AMEX, and NASDAQ stocks (from CRSP) minus the one-month Treasury bill rate (from Ibbotson Associates). SMB and HML are constructed using 6 value-weighted portfolios (which are constructed at the end of each June and are the intersections of 2 portfolios formed on size (market equity, ME) and 3 portfolios formed on the ratio of book equity to market equity (BE/ME). The size breakpoint for year t is the median NYSE market equity at the end of June of year t. BE/ME for June of year t is the book equity for the last fiscal year end in t-1 divided by ME for December of t-1. The BE/ME breakpoints are the 30th and 70th NYSE percentiles. SMB (Small Minus Big) is the average return on the three small portfolios minus the average return on the three big portfolios (1/3 (Small Value + Small Neutral + Small Growth) - 1/3 (Big Value + Big Neutral + Big Growth)). HML (High Minus Low) is the average return on the two value portfolios minus the average return on the two growth portfolios (1/2 (Small Value + Big Value) - 1/2 (Small Value + Big Value)). MOM is constructed and calculated in the same fashion as HML but with six value-weighted portfolios formed on size and prior (2-12) returns.

size-adjusted returns at the .10 (.05) significance levels.[17] Results were similar for the three-month and nine-month return periods.

In addition, the following regression is estimated for quintile 5 of VER scores:

$$(2) \qquad SA\ RETURN_{it} = \alpha_0 + \beta_1 IND_{it} + \beta_2 VER_{it} + \varepsilon_{it}$$

In (2), SA RETURN is the future size-adjusted return for firm i in month t and IND is an indicator equal to 1 if firm i was selected for publication in month t and zero otherwise. VER is the VER score for firm i in month t and is included to control for whether the returns to the publication sample resulted simply because the Firm selected the highest VER score companies from within the 5th quintile. This regression was estimated separately for each of the 38 months in the sample period (results are presented in Table 9, panel B). The intercept and coefficients were averaged and the standard deviation of these 38 coefficients was used to compute a t-statistic.

For the six-month return window, the resultant coefficient on IND was -0.05 with a p-value of 0.0039, suggesting that the size-adjusted returns to the full-publication sample were significantly different from the average returns to firms with a quintile 5 VER score. The coefficient on VER (β_2) was negative -0.001 and significant at the .01 level for the six-month return window. This result suggests for every 10 points in VER score, the six-month, size-adjusted returns were 0.1% lower (the mean VER score in the full-publication sample was 42.96 and the standard deviation was 6.59). Results were comparable using a three-month and a nine-month return period.

Finally, the alphas (α_0) from the Fama-French plus momentum calendar-time

[17] The number of independent observations used for the VER quintile 5 sample was 9,989/3 or 3,330. Given that the variables comprising the VER scores are measured quarterly, the sample size was reduced by a factor of three to mitigate the potential bias in the significance of the proportion tests resulting from repeat observations. The reduction is conservative as it implies perfect correlation within each quarter.

returns regressions from the publication sample and the VER quintile 5 sample were compared (results are tabulated in Table 9, Panel C). The full-publication sample monthly alpha (-0.9%) was not statistically significantly different (the p-value was 0.1351) from the VER quintile 5 alpha (0.0%). However, the monthly alpha for the full-length report sample (-1.7%) was significantly different from the VER quintile 5 monthly alpha. As in Table 3, untabulated results were similar for publication-sample portfolios constructed with entry and exit dates on the first of the month following initial publication and closure. This alternate construction limits the likelihood that the returns to the publication firms were the result of the act of publication (i.e. the Firm's market impact, see section 4.5 below for further discussion of the Firm's market impact).

The size-adjusted return tests are consistent with hypothesis 2 (the human-driven qualitative analysis provides incremental value beyond the machine-driven quantitative analysis). The results from the calendar-time tests are weaker, but still provide some evidence in support of hypothesis 2 (i.e. the sub-sample of companies, the full-length report sample, resulting from the Firm's greatest amount of qualitative analysis outperform the Firm's quantitative model). Collectively, the results of the event-time and the calendar-time returns tests suggest that the Firm's qualitative process results in the selection of companies that outperform the Firm's quantitative model at identifying companies that subsequently generate negative abnormal returns.

4.4 Returns Around Future Earnings Windows

The Firm's goal is to select companies for publication that will underperform the market; accordingly, this study is focused on stock returns. However, given that the Firm's primary research method is financial statement analysis, I would expect that the returns to

the publication sample would have been clustered around the reporting of their financial results. Accordingly, I examine the returns during short-windows surrounding earnings announcements subsequent to the Firm's publications. These results are tabulated in Table 10. The raw returns in the three-day period surrounding the first three earnings announcement dates following the initial publication on each of the companies comprising the full-publication, the brief report, and full-length samples are tabulated. The returns are not significantly different from zero at any traditional significance level.

While somewhat surprising, the results are consistent with several results from the accounting literature. Researchers, including Skinner (1994), have provided evidence suggesting that bad news earnings announcements are often preempted (with voluntary disclosure). In addition, Sloan (1996) for example, finds that results to the short side of the accruals hedge strategy were not clustered around future windows and concluded that the results were consistent with the evidence from prior research suggesting that bad news is preempted. Several studies (e.g. Brown and Caylor, 2005) have documented that the incentives to preannounce bad news earnings and/or walk down analyst expectations have increased in recent periods. In this light, anecdotally, several of the Firm's most successful research calls (companies published on that subsequently underperformed the market by the widest margins) during the sample period were situations where a negative stock return catalyst was the result of an earnings preannouncement and/or a major guidance revision.

4.5 Market Impact

As shown in Table 11, the one-day (five-day) return was -0.4% (-0.3%) following the Firm's initial publication on a company and -0.1% (-0.6%) following closure of coverage

TABLE 10

Short-Window Raw Returns Around Future Earnings Announcements

Panel A: Full-publication sample

	Mean	p-value (from zero)	# of obs
Three-day raw return around earnings announcement one	0.0044	0.5216	203
Three-day raw return around earnings announcement two	-0.0053	0.5170	203
Three-day raw return around earnings announcement three	0.0047	0.4410	201

Panel B: Brief report sample

	Mean	p-value (from zero)	# of obs
Three-day raw return around earnings announcement one	0.0025	0.7631	122
Three-day raw return around earnings announcement two	-0.0006	0.9459	122
Three-day raw return around earnings announcement three	0.0018	0.7830	121

Panel C: Full-length report sample

	Mean	p-value (from zero)	# of obs
Three-day raw return around earnings announcement one	0.0073	0.2619	81
Three-day raw return around earnings announcement two	-0.0125	0.1315	81
Three-day raw return around earnings announcement three	0.0091	0.1456	80

The sample period is February 2007-March 2010, consisting of 203 separate initiations and closures of research coverage. Returns are the simple three-day returns around the three subsequent earnings announcement for each company following the Firm's initial publication. Initiations represent the opening of coverage through the publication and distribution of a report to the Firm's clients. All the Firm's reports are posted to its client-only, restricted-access webpage and simultaneously emailed to paid subscribers at 7 AM Eastern Standard Time. P-values are based on a standard two-side t-test.

TABLE 11

Short-Window Raw Returns to Full-publication Sample

	Mean	p-value (from zero)	# of obs
One-day raw return following initiation	-0.0041	0.0212	203
Five-day raw return following initiation	-0.0079	0.4255	203
One-day raw return following closure	-0.0013	0.5832	203
Five-day raw return following closure	-0.0056	0.2591	203

The sample period is February 2007-March 2010, consisting of 203 separate initiations and closures of research coverage. Returns are the simple one- and five-day returns following the Firm's publications (the full-publication sample). Initiations represent the opening of coverage through the publication and distribution of a report to the Firm's clients. Closures represent publications, wherein the Firm communicates to clients that it no longer believes the risk of underperformance is elevated. All the Firm's reports are posted to its client-only, restricted-access webpage and simultaneously emailed to paid subscribers at 7 AM Eastern Standard Time. One-day returns are the returns on the day of a publication. Five-day returns are measured over the period including the day of the publication and the next four subsequent trading days.

(the Firm closes coverage on companies by reducing its rating to balanced risk, i.e. neutral or hold). The act of reducing a rating to five or below is understood by the Firm's clients to indicate that it no longer believes the risk of underperformance is elevated. The one-day returns following initiation of coverage were different from zero at the .05 level (based on a two tailed t-test). However, the five-day returns following initiation and both the one and five-day returns following coverage closure were not different from zero at any traditional significance level. Further, the difference in both one-day and five-day returns at initiation and closure were not significantly different from each other. While the results are mixed, collectively, the short-window returns tests suggest that the act of publication was not a major factor in the performance of securities selected by the Firm for publication. In other words, the short-window results suggest that reputation was not a primary contributor to the negative returns to securities selected for publication by the Firm.

4.6 Idiosyncratic Risk Discussion

Several characteristics of the sample make it likely that the returns to the publication companies were economically significant and robust to transactions costs. First, the Firm does not publish research on companies unless they meet the following characteristics: (1) greater than $1.0 billion in market capitalization, (2) greater than $10.0 million[18] in average daily trading volume on either the NYSE or NASDAQ stock exchanges, and (3) less than 10.0% short interest as a percentage of float. Given that short-sale borrowing costs are generally inversely correlated with liquidity and positively correlated with short interest levels, it is unlikely that investors endeavoring to profit from the Firm's research

[18] Average daily trading volume, on a three-month basis, of NYSE and NASDAQ listed firms during the sample period was $26.85 million per day.

would face unusually high transaction costs. The mean average daily trading volume, price-per-share, market capitalization, and short interest as a percentage of float for the sample of firms published on by the Firm was $47.42 million, $41.01, $5.57 billion, and 4.44%. This compares to a mean average daily trading volume, price-per-share, market capitalization, and short interest as a percentage of float for the sample of firms screened by the Firm's quant model during the sample period of $44.11 million, $37.23, $10.67 billion, and 6.56%.

Chapter 5

Conclusion

This study examines two questions: (1) whether a group of fundamental analysts (collectively, "the Firm") were able to identify companies whose equity securities subsequently underperformed the market and (2) whether the analysts' success was driven by quantitative analysis (machine-driven analysis of financial statements and other public disclosure), qualitative analysis (manual analysis of the same material), or both. This research documents negative abnormal returns to a sample of 203 negative (i.e. sell) recommendations issued by the Firm between February 2007 and March 2010. Then, this research exploits access to the Firm's internal decision making data to study the relative contribution of the quantitative and qualitative components of fundamental analysis. Because I do not find statistically significant evidence that the Firm's quantitative model was able to separate winners from losers or outperform a simple accounting-based metric (percent accruals) commonly known to be correlated with future abnormal stock price movements, I conclude that the Firm's success was driven by qualitative fundamental analysis. While it is beyond the scope of this research to study how or why, the results of the tests conducted indicate that the human judgment employed by the Firm adds value beyond its computers. In fact, the human judgment was the primary source for the success of the Firm's investment research. This is consistent with results from medical diagnosis, weather forecasting, and other research

fields, which collectively support the conclusion that human judgment continues to play a valuable role despite the existence of significant computer-based decision making tools. While computing advancements may diminish the role of humans in the investment decision process in the future, at a minimum, the human's understanding of the capabilities and limitations of the computer she designed suggest a human role will remain for some time.

This research contributes to the literature by providing additional evidence on the usefulness of accounting-based fundamental analysis. In addition, this research contributes to the literature by separately studying the contribution of the quantitative and qualitative components of accounting-based fundamental analysis. Two significant limitations of this study significantly limit the generalizability of its results: (1) other research and/or investment firms may have a more effective and/or sophisticated quantitative process (which could perform certain portions of the Firm's qualitative analysis) and (2) the unusual market and macroeconomic features of the time period studied. In addition, this study does not address questions about the costs and benefits of the two components of the Firm's research. While it is intuitive that the benefits of the Firm's total research processes outweigh its costs given the Firm's existence as a going concern, it is unclear if (1) further investment targeted at developing quantitative procedures to replace certain qualitative tasks would be economically justified or (2) the incremental costs to conduct qualitative analysis outweigh the incremental costs.

Finally, given that the Firm initiated coverage exclusively on large companies with high liquidity and low short interest, it is unlikely that the results were the product of returns to securities with high arbitrage and/or transaction costs.

Appendix 1 - Brief Report Sample

Balance Sheet Watch

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858-793-2420

March 19, 2009

Our *Balance Sheet Watch* is intended to provide clients a list of companies which, based upon our initial screening and opinion, exhibit evidence that recent financial results may not accurately reflect potential fundamental business deterioration, competitive landscape challenges, and/or operational inefficiencies.[1] Companies in this universe may be subject to more rigorous examination in our *Comprehensive Analysis* reports.

Pentair, Inc. **PNR** **$21.18** **Market Cap: $2.1B**

- Evidence of weakening demand and heightened level of channel inventories.
- Growth in DSO suggests an extension of customer payment terms and/or slowing collections.
- Build in prepaid expenses suggests aggressive cost capitalization.
- Discretionary reserve reductions benefitted FY 08 earnings by $0.11.
- Potentially aggressive pension assumptions understate (overstate) liabilities (earnings), in our view.

[1] Refer to the last page for important disclosures.

Pentair, Inc. (PNR)

Recent Price:	$21.18	Market Cap:	$2.1 billion	Short Interest:	3.5%
52 Week Range:	$17.23 – $41.00	Avg. Volume:	893,275	Risk period:	1 to 3 Quarters

Earnings Risk Assessment: 9

Company description: Pentair, Inc. (PNR) is an industrial manufacturing company comprised of two segments: Water (65.8% of FY 08 revenue) and Technical Products (34.2% of FY 08 revenue). The Company's Water group provides products and systems used in water flow, filtration, and commercial and residential pools. Its Technical Products group designs and manufactures enclosures that house and protect sensitive electronics and thermal management products. The Company sells its Water group products through wholesale and retail distributors, original equipment manufacturers, home centers, and home and pool builders. Its Technical Products group distributes through electrical and data contractors, electrical and electronic components distributors, and original equipment manufacturers. In FY 08, the Company generated approximately 65.0% of revenue in domestic operations and 35.0% in international markets. Incorporated in 1966, the Company is headquartered in Golden Valley, MN, and its fiscal year ends on 12/31.

Evidence of weakening demand: On 02/03/09, the Company reported Q4 08 revenue (earnings from continuing operations) of $767.6 million ($0.22), which was below (above) guidance of $840 million - $850 million ($0.17 - $0.20). On its Q4 08 Conference Call, the Company cited macroeconomic deterioration as the primary reason for lower than expected revenue.

> What started out as an uncertain economic environment quickly became a quarter of mired and rapid market declines. Our original forecast did not predict this unprecedented decline... Of course, you've all seen the headlines, practically every company has highlighted significant slowdowns in either October or November or December, or perhaps all three. For Pentair, the declines were felt most severely in the latter parts of the quarter. The speed and severity of the decline was stunning... (Chairman and CEO Mr. Randall J. Hogan, Q4 08 Conference Call)

The Company also represented that it expects further deterioration within its end markets during FY 09.

> The global credit crisis and recession have adversely affected the robustness of our markets as exemplified in the fourth quarter of 2008...Difficult economic and competitive factors adversely affected our ability to sustain consistent organic growth in 2008, as revenues contracted in the fourth quarter. As a result of these economic conditions, that adversely impacted our anticipated financial performance, we did not meet our stated revenue growth targets in the fourth quarter and for the year 2008. We believe that our revenues will continue to decline as our markets weaken. (FY 08 10K)

Inventory build suggests heightened risk of margin compression and/or write-offs: In Q4 08, inventory-to-twelve-month revenue (DSI) increased 7.8% (14.5%) year-over-year. On the Q4 08 Conference Call, the Company indicated it expects inventory corrections in the distribution channel in Q1 08.

> So, if you take a look at Q4, and you bring it into Q1, we assume that things don't get better than somewhat we've seen in December and January. ***That we continue to see the inventory corrections in the channels and that we continue to see some cautious views as far as taking product either for capital reasons or just through the distribution channels.*** (Executive VP and CFO Mr. John L. Stauch, Q4 08 Conference Call) [emphasis added]

Given the Company's expectation for inventory destocking at the distributor level, we are concerned about (1) potential revenue short-falls as the Company may ship less into the channel, (2) margin pressure as the Company may be required to sell inventory to distributors at lower prices, and (3) potential charges for obsolescence in light of the recent inventory build.

Inventory Analysis ($ in millions)	Q4 08	Q3 08	Q2 08	Q1 08	Q4 07
Inventory	$417.3	$430.4	$437.4	$416.1	$379.0
Twelve-month revenue	$3,352. 0	$3,391.0	$3,344.6	$3,330.8	$3,280.9
Inventory-to-twelve-month revenue	0.124	0.127	0.131	0.125	0.116
Year-over-year change	*7.8%*	*3.2%*	*5.4%*	*0.4%*	*(8.6%)*
DSI	74.8	65.8	62.6	61.1	65.4
Year-over-year change	*14.5%*	*3.6%*	*5.8%*	*(6.8%)*	*(4.7%)*
Accounts payable	$217.9	$225.9	$238.7	$235.8	$227.8
Accounts payable-to-inventory	0.522	0.525	0.546	0.567	0.601
Year-over-year change	*(13.1%)*	*1.6%*	*2.0%*	*11.1%*	*16.2%*

DSO growth suggests an extension of payment terms and/or slower distributor collections: In Q4 08, DSO increased 12.3% year-over-year from 53.9 days to 60.5 days. This represents the fourth consecutive year-over-year increase. We believe the growth in DSO suggests the Company extended customer payment terms in response to weakening demand, and/or distributors are slowing payments due to the lack of sell-through to end customers.

DSO Analysis	Q4 08	Q3 08	Q2 08	Q1 08	Q4 07
DSO	60.5	57.2	59.5	57.8	53.9
Year-over-year change	*12.3%*	*2.0%*	*10.3%*	*5.8%*	*(0.7%)*

Reduction to allowance for doubtful accounts boosts earnings: The allowance for doubtful accounts declined from $27.5 million as of FY 07, to $25.2 million as of FY 08. Further, allowance-to-gross accounts and notes receivable declined 7.9% year-over-year. Had the allowance remained consistent with the prior-year level, FY 08 earnings would have been $0.02 lower.

Allowance Analysis ($ in millions)	FY 08	FY 07
Allowances for accounts and notes receivable	$25.2	$27.5
Gross accounts and notes receivable	$486.2	$488.9
Allowance-to-receivables	0.052	0.056
Year-over-year change	*(7.9%)*	*(25.1%)*

Discretionary reduction to warranty reserve boosts earnings: In FY 08, the warranty reserve decreased 19.1%, while cost of goods sold increased 3.1%. Accordingly, warranty reserve-to-cost of goods sold decreased 21.5%. Had the warranty reserve remained consistent with the prior-year level, FY 08 earnings would have been $0.09 lower.

Warranty Balance Analysis ($ in millions)	FY 08	FY 07
Warranty reserve	$31.6	$39.0
Cost of goods sold	$2,337.4	$2,268.2
Warranty-to-cost of goods sold	0.014	0.017
Year-over-year change	*(21.5%)*	--

Build in prepaid expenses suggests aggressive cost capitalization: In FY 08, prepaid expenses increased 76.3% while total assets increased 1.3%. Accordingly, prepaid expenses-to-total assets increased 74.0%. In light of the build in prepaid expenses, we are concerned about potential margin pressure in future periods as these costs flow through the income statement.

Prepaid Expense Analysis ($ in millions)	Q4 08	Q3 08	Q2 08	Q1 08	Q4 07
Prepaid expenses and other current assets	$63.1	$53.5	$46.2	$43.2	$35.8
Total assets	$4,053.2	$4,251.1	$4,344.0	$4,170.4	$4,000.6
Prepaid expenses-to-total assets	0.016	0.013	0.011	0.010	0.009
Year-over-year change	*74.0%*	*5.1%*	*1.6%*	*(5.4%)*	*(3.6%)*

Positive operating accruals suggest unsustainable earnings: In Q4 08, twelve-month cash from operations decreased 40.2% while net income increased 8.4% year-over-year. Accordingly, cash from operations-to-net income decreased 44.8% and accruals were positive for the second consecutive quarter. In our view, the deterioration in cash flow and the positive accruals suggest unsustainable earnings.

Cash Flow Analysis ($ in millions)	12M Ended Q4 08	12M Ended Q3 08	12M Ended Q2 08	12M Ended Q1 08	12M Ended Q4 07
Cash from operations (CFO)	$204.2	$249.2	$319.0	$328.6	$341.3
Net income	$228.7	$272.7	$289.6	$212.9	$210.9
CFO-to-net income	0.893	0.914	1.101	1.543	1.618
Year-over-year change	*(44.8%)*	*(45.2%)*	*(30.6%)*	*6.9%*	*28.4%*
Accruals	$24.5	$23.5	($29.4)	($115.7)	($130.4)

Heightened risk of intangible asset impairment: In recent years, the Company has grown its business through making acquisitions. On 06/28/08, the Company acquired 80.1% of General Electric Company's (GE) global water softener and residential water filtration business for approximately $229.2 million, of which $204.4 million (89.2%) was allocated to goodwill and identifiable intangible assets. From FY 06 through FY 08, the Company spent $518.9 million on four large acquisitions and a few small ones.

> Over the past four years, much of our growth has resulted from acquisitions of businesses within our current business segments...We cannot assure you that we would be able to continue to grow or to limit revenue declines without making acquisitions. (FY 08 10K)

As a result of the Company's acquisitive strategy, goodwill and intangible assets totaled 64.6% (137.9%) of total assets (stockholders equity) as of Q4 08. ***Given the deterioration in cash flow and evidence of weakening demand, we believe the Company may be subject to material charges for impairment of intangible assets.***

Potentially aggressive pension assumptions: The Company assumed a discount rate on US pension plan liabilities of 6.5% in FY 08 and FY 07, and 6.0% in FY 06. Discount rates used on foreign plans ranged from 2.0% to 6.25% in FY 08, 2.0% to 5.25% in FY 07, and 2.0% to 5.15% in FY 06. In addition, the Company reduced the expected rate of compensation assumption from 5.0% in FY 07 to 4.0% in FY 08. ***By increasing the discount rate and decreasing the rate of compensation, we believe the Company effectively reduced its pension liability***. Further, the expected rate of return on plan assets remained flat at 8.5% in spite of (1) a negative pension plan yield of 28.8% in FY 08 and (2) a shift in asset allocation policy from equities and alternative investments toward potentially lower-returning instruments such as fixed-income securities.

> During 2008, as part of our regular practice of reviewing asset allocations and assessing target allocations, we increased the targeted fixed income allocation from 10% to 30% and reduced the equity securities allocation and alternative investment allocation by 10% each. The transition to these new target allocations will be conducted in an orderly manner. We plan to increase our allocation to long duration fixed income securities in future years as the funded status of our U.S. pension plans improve. (FY 08 10K)

Due to the change in asset allocation policy, we believe the Company should have lowered its expected rate of return on pension plan assets. If the Company reduced its expected rate of return, reported pension expense (earnings) would increase (decrease) in FY 09. ***In our view, earnings (liabilities) may be overstated (understated) due to the potentially aggressive pension assumptions.***

Disclaimer and Disclosure

Appendix 2 – Full-Length Report Sample

Yahoo! Inc. (YHOO – $15.31) May 26, 2010

Yahoo! Inc. (YHOO) is a global developer, owner, and operator of internet properties across four primary categories: 1) integrated consumer experiences; 2) applications; 3) search; and 4) media products and solutions. The Company provides marketing services to advertisers covering owned and operated (O&O) and certain third-party affiliate websites and it generates fees from end-users for premium services. Its offerings include the display of graphical advertisements (display advertising), the display of text-based links to advertiser websites (search advertising), listing-based services, and commerce-based transactions. Headquartered in Sunnyvale, CA, the Company's fiscal year ends on 12/31.

Thesis Summary

We are concerned about revenue and earnings sustainability given evidence of intensifying competitive landscape challenges, an increase in traffic acquisition costs, a decline in deferred revenue, and a divergence between pro forma cash from operations and pro forma non-GAAP net income. In addition, we believe a change in the Company's Executive Incentive Plan performance targets may have provided motivation for the Company to engineer strong earnings. **We are initiating coverage of Yahoo! Inc. with an Earnings Risk Assessment score of 9.**

Earnings Risk Assessment: 9
Scale: 1 (lowest risk) to 10 (highest risk)*

Company Data

Avg. Volume	26,023,900
Shares Outstanding (mil)	1,385.1
Market Cap (bil)	$21.2
Float (mil)	1,253,1
52 Week Range	$13.97 – $19.12
Country/Exchange	US/NASDAQ
Short Interest (mil)	40.0
% of Float Short	3.1%

Historical EPS

	Actual	Expected	Surprise
Q1	$0.15	$0.10	50.0%
Q4	$0.11	$0.11	--
Q3	$0.13	$0.07	85.7%

Earnings Estimate Drift

	Est.	7 Days ago	1M ago	1Yr ago
Q2 10	$0.14	$0.14	$0.14	$0.11
FY 10	$0.62	$0.62	$0.63	$0.44
FY 10 P/E	24.6	25.8	27.7	34.0

Peers mentioned in this piece

Yahoo Japan Corporation (4689.T)
Google Inc. (GOOG)
AOL Inc. (AOL)
Microsoft Corporation (MSFT)
News Corporation (NWSA)
Apple Inc. (AAPL)
AT&T Inc. (T)
Alibaba.com Limited (1688.HK)
Facebook, Inc.
MySpace, Inc.

Background and Bull Story

- **Company description:** Yahoo! Inc. (YHOO) is a global developer, owner, and operator of internet properties across four primary categories: 1) integrated consumer experiences; 2) applications; 3) search; and 4) media products and solutions. The Company provides marketing services to advertisers covering owned and operated (O&O) and certain third-party affiliate websites and it generates fees from end-users for premium services. Its offerings include the display of graphical advertisements (display advertising), the display of text-based links to an advertiser's website (search advertising), listing-based services, and commerce-based transactions. Headquartered in Sunnyvale, CA, the Company's fiscal year ends on 12/31.

- **Microsoft search agreement expected to enhance operating income:** On 07/29/09, the Company and Microsoft Corporation (MSFT) announced a Search and Advertising Services and Sales Agreement and a License Agreement (the Search and License Agreements hereinafter). Under the terms of the Search and License Agreements, the Company and Microsoft formally agreed to combine certain parts of their online search advertising businesses. In its 07/29/09 Press Release, the Company stated that the Search and License Agreements were expected to result in a $500.0 million annual benefit to operating income and $200.0 million of annual capital expenditure (capex) savings.

- **Rebound in display advertising:** In Q1 10, display revenue from the Company's owned and operated (O&O) websites increased 19.7% (y/y) to $444.0 million, representing the first year-over-year increase in at least four quarters. On its 04/20/10 Q1 10 Conference Call, the Company attributed the increase to a rebound in spending by large advertisers. Subsequently, on 05/13/10, industry data provider comScore, Inc. (SCOR) issued a Press Release stating that Q1 10 Total Display Ad Impressions in the U.S. increased 15.4% (y/y) to 1.1 trillion. As the market leader in display advertising, the Company may be well-positioned to benefit from a rebound in display advertising spending.

- **Growth opportunity in local business advertisements:** On 07/21/09, the Company and AT&T Interactive announced an agreement whereby AT&T Interactive (a subsidiary of AT&T, Inc. (T)) would begin to sell the Company's display inventory in the summer of 2009. In its 07/21/09 Press Release, the Company represented that the total size of the local online advertising market was $14.0 billion.

- **Valuation:** The Company's shares trade approximately in-line with peers on a forward price-to-earnings basis.

Voyant's Earnings Risk Assessment

- **Background on click fraud:** Click fraud refers to an abuse of the cost-per-click (CPC) pricing model whereby an end-user artificially increases the amount of clicks registered on a particular advertisement. The motivations for click fraud include the generation of CPC advertising fees by operators of affiliate websites and the skewing of an entity's advertising campaign by a competitor. Incidents of click fraud can reduce return on investment for the Company's customers, thereby potentially making the Company's properties less-attractive to advertisers.

- **Evidence of a lower rate of click fraud on social networks:** The Company competes with other online media entities such as social networking websites and traditional providers of media-related content. In its Q1 10 Click Fraud Report, ClickForensics, Inc. represented that the Q1 10 industry average click fraud rate increased 360 (210) basis points (bps) year-over-year (sequentially) to

17.4%, and that the Q1 10 click fraud rate for social networking websites was 11.5%, 590 bps below the industry average. Given that a lower rate of click fraud may translate into a higher return on investment for the Company's customers, we believe that the Company may lose market share if advertisers shift a greater portion of their spending to social networking websites.

- **Concerns about competition from Facebook:** In its 05/13/10 Press Release, comScore represented that Facebook was the top US display ad publisher in Q1 10 (with a 16.2% market share). On 02/18/10, Facebook announced that it would offer Paypal, a global online payment option, in key parts of its advertising and developer systems. Given the expansion of Facebook's market share in the US online display advertising market, we are concerned about the Company's ability to maintain its competitive position in the marketplace.

- **Company at a competitive disadvantage in mobile advertising, in our view:** Given the prospects for growth in mobile advertising, several of the Company's competitors have undertaken initiatives to expand their presence in the space. On 04/08/10, Apple Inc. (AAPL) introduced iAd, a new mobile advertising platform that enables developers to embed advertisements within mobile applications. On 05/21/10, Google Inc. (GOOG) received regulatory clearance to acquire AdMob, Inc., a privately-held mobile display advertisement technology provider, enabling it to embed advertisements within mobile applications. We believe the Company is at a competitive disadvantage given that it does not offer a mobile operating system (like that of Apple's iPhone OS or Google's Android). Further, we are concerned about the sustainability of revenue as advertisers may shift their budgets in favor of mobile initiatives.

- **Lower-than-expected O&O search revenue:** On 04/20/10, the Company reported Q1 10 non-GAAP revenue (non-GAAP loss) of $1,130.4 million ($0.15). Q1 10 non-GAAP revenue was 3.4% ($39.5 million) below the consensus estimate, while non-GAAP earnings, excluding a $0.02 non-recurring tax benefit, were 30.0% ($0.03) above the consensus estimate. On its Q1 10 Conference Call, the Company represented that O&O search revenue was weaker-than-expected.

- **Increase in TAC may pressure gross margin, in our view:** For search and/or display advertising revenue generated on Affiliate websites, the Company pays its Affiliates (referred to as "traffic acquisition costs" or "TAC"). In Q1 10, TAC increased 10.1% (y/y) in absolute terms and 240 basis points (bps) relative to GAAP revenue. Based upon representations made by the Company in its FY 09 10K and on its Q2 09 Conference Call, we believe that the increase in TAC was driven by a higher TAC rate on newly signed Affiliate agreements. Hence, we are concerned about the sustainability of gross margin.

- **Background on quality initiatives:** In FY 08, the Company implemented certain initiatives to improve the quality of its Affiliate network. Subsequently, in Q2 09, the Company announced that it planned to implement similar quality initiatives for its O&O websites (ad quality initiatives hereinafter). On its Q2 09 Conference Call, the Company stated it would decrease ad frequency or remove certain ads from its O&O websites. The Company guided for the initiatives to have a $75.0 million negative impact on its quarterly revenue ($300.0 million annualized).

- **Potentially unsustainable benefit to Q1 10 revenue:** In Q1 10, total deferred revenue-to-revenue declined 24.9% (y/y) to 0.284. In addition, current deferred revenue declined $59.3 million sequentially, representing the largest sequential decline in at least three years. Given a decline in deferred revenue and a lower-than-expected impact from the ad initiatives, we believe the Company may have delayed certain ad quality initiatives to enhance its Q1 10 results.

- **Decline in long-term deferred revenue heightens our revenue sustainability concerns:** In Q1 08, the Company received a $350.0 million one-time payment from AT&T related to the conversion of its broadband relationship with AT&T into a revenue-sharing agreement. In its FY 08 10K, the Company disclosed that the payment was recorded as deferred revenue. On its Q3 08 Conference Call, the Company represented that revenue related to the one-time payment would

decline over several years. Given a decline in the conversion rate of long-term to current deferred revenue, we believe that deferred revenue related to the AT&T agreement has been significantly depleted and/or that customers may have elected shorter contract terms.

- **Earnings are unsustainable, in our view:** In Q1 10, pro forma cash from operations declined 15.3% (y/y) to $271.4 million, while pro forma non-GAAP net income increased 38.2%. Accordingly, pro forma cash from operations-to-non-GAAP net income declined 38.7% (y/y) to 1.595. During the quarter, deferred revenue used $54.5 million of cash. Given the divergence between pro forma cash from operations and pro forma non-GAAP net income, we believe earnings are unsustainable.

- **Executive bonus targets:** In its FY 09 10K, the Company disclosed that its Executive Incentive Plan (EIP) performance measures were changed for FY 10. In FY 10, 70.0% of cash bonuses are linked to the achievement of certain GAAP revenue and operating income targets (as opposed to non-GAAP measures in FY 09). Given our concerns about potentially unsustainable benefits to Q1 10 revenue, we believe that the change in the EIP performance measures may have provided motivation for the Company to engineer strong financial results.

Risks to Our Thesis and Conclusion

- **Risks to our thesis:** The following developments could present challenges to our thesis: (1) The Microsoft Search and License Agreements enable the Company to expand its operating margin; (2) Ad initiatives result in improved advertiser return on investment and increased demand for ad inventory; (3) Expansion of website content offerings results in increased end-user demand; (4) Revenue and earnings increase due to the addition of new affiliates; and/or (5) The Company completes a transformative acquisition or is acquired.

- **Conclusion:** We are concerned about revenue and earnings sustainability given evidence of intensifying competitive landscape challenges, an increase in traffic acquisition costs, a decline in deferred revenue, and a divergence between pro forma cash from operations and pro forma non-GAAP net income. In addition, we believe a change in the Company's Executive Incentive Plan performance targets may have provided motivation for the Company to engineer strong earnings. We are initiating coverage of Yahoo! Inc. with an Earnings Risk Assessment score of 9.

Background and Bull Story

Company Background

Company description: Yahoo! Inc. (YHOO) is a global developer, owner, and operator of internet properties across four primary categories: 1) integrated consumer experiences; 2) applications; 3) search; and 4) media products and solutions. The Company provides marketing services to advertisers covering owned and operated (O&O) and certain third-party affiliate websites and it generates fees from end-users for premium services. Its offerings include the display of graphical advertisements (display advertising), the display of text-based links to an advertiser websites (search advertising), listing-based services, and commerce-based transactions. Headquartered in Sunnyvale, CA, the Company's fiscal year ends on 12/31.

The Company sells its marketing services directly and indirectly through four sales channels. Its field advertising, telesales, and online self-service and reseller channels serve large advertisers and agencies, medium-sized business advertisers, and small business advertisers. In addition, the Company enters into revenue sharing agreements with third-party entities including internet and telecommunication service providers, mobile device original equipment manufacturers (OEMs), internet content publishers, and website operators. The revenue sharing agreements increase distribution of its software and services and extend the reach of search and display advertisements. In Q1 10, the Company generated 54.8% of revenue from its O&O websites and 34.3% of revenue from third-party affiliates.

Revenue by Type	Q1 10 (% of Total)	Revenue by Segment	Q1 10 (% of Total)
O&O search	21.5%	United States	70.2%
O&O display	27.8%	International	29.8%
O&O listings and other services	5.5%	--	--
Affiliate	34.3%	--	--
Total marketing services	89.1%	--	--
Fees	10.9%	--	--
Total	100.0%	Total	100.0%

The Company's portfolio of internet properties includes its internet search engine, e-mail and instant messaging services, and websites containing media-related content, photo management and sharing applications, and product and service listings.

Customers have the following options for purchasing ad space on the Company's websites and those of its Affiliates:

1. **Auction model with CPC pricing:** Under the auction model with CPC pricing, advertisers submit bids to the Company representing the maximum "cost-per-click" (CPC) that they are willing to pay for the inclusion of their advertisements in end-user search results. Advertisers pay the CPC each time an end-user selects, or "clicks," on its advertisement. The Company determines the ultimate placement of the advertisements based on customer bids and the quality of the advertisements submitted.

2. **Guaranteed placement with CPM pricing:** Under a guaranteed placement contract with CPM pricing, advertisers purchase a fixed volume of ad impression deliveries at a predetermined cost-per-thousand impressions (CPM) delivered by the Company to end-users.

3. **Inventory bundling:** The Company refers to the advertising space available on its websites as inventory. Inventory bundling agreements enable advertisers to purchase customized packages of search and display inventory with various pricing arrangements.

Select Yahoo! Inc. Properties	Description	Category
Yahoo! Search	Internet search engine	Search
Yahoo! Home Page	Navigation hub/search offering	Integrated consumer experiences
Yahoo! Mail	E-mail service	Applications
Yahoo! Messenger	Instant messaging service	Applications
Flickr	Photo management and sharing service	Applications
Yahoo! Finance	Financial news, tools, and data	Media
Yahoo! Sports	Fantasy games/sporting news and statistics	Media
Yahoo! Entertainment	Movie, music, and television content	Media
Yahoo! Hotjobs	Employment listings and career-related content	Other
Yahoo! Autos	Automobile listings and related content	Other

Background on equity method investees: Pursuant to Accounting Standards Codification (ASC) 323, "Investments – Equity Method and Joint Ventures," the Company accounts for jointly controlled entities (equity method investees hereinafter) under the equity method of accounting. Under the equity method of accounting, the individual assets and liabilities of equity method investees are not consolidated. Rather, the Company reports an investment asset on its balance sheet which represents its share of the equity method investee plus its proportion of any undistributed earnings. Similarly, the Company reports its share of the equity method investees post-tax earnings in its income statement.

In Q1 10, the Company's equity method investees included a 35.0% ownership interest in Yahoo Japan Corporation (4689.T), a local version of the Company's business in Japan, and a 43.0% ownership interest in Alibaba Group Holding Limited, a privately-held entity comprised of five Chinese internet businesses. Alibaba Group's holdings include China Yahoo!, the Company's Chinese business, and Alibaba.com Limited (1688.HK), a Chinese entity engaged in the operation of e-commerce websites for small businesses. In Q1 10, the Company's equity method investments comprised 24.5% (28.8%) of total assets (total equity), and earnings in equity interests comprised 39.9% (28.0%) of the Company's non-GAAP (GAAP) net income.

Equity Interests Analysis ($ in millions)	Q1 10	Q4 09
Total assets	$14,648.8	$14,936.0
Total equity	$12,447.9	$12,518.6
Alibaba Group	$2,208.5	$2,167.0
Yahoo Japan Corporation	$1,374.7	$1,329.3
Total investments in equity interests	$3,583.1	$3,496.3
As % of total assets	*24.5%*	*23.4%*
As % of total equity	*28.8%*	*27.9%*

Earnings Analysis ($ in millions)	Q1 10	Q4 09	Q3 09	Q2 09	Q1 09
Non-GAAP net income	$218.8	$200.2	$145.3	$145.4	$123.1
GAAP net income	$312.3	$155.7	$187.8	$143.0	$118.7
Earnings in equity interests	$87.4	$68.6	$68.7	$64.2	$48.9
As % of non-GAAP net income	39.9%	34.3%	47.2%	44.1%	39.8%
As % of GAAP net income	28.0%	44.1%	36.6%	44.9%	41.2%

The Bull Story: Potential Operating Margin Expansion, Rebound in Display Advertising

Microsoft search agreement expected to enhance operating income: On 07/29/09, the Company and Microsoft announced a Search and Advertising Services and Sales Agreement and a License Agreement (the Search and License Agreements hereinafter). Under the terms of the Search and License Agreements, the Company licensed its core search technologies to Microsoft and agreed to utilize Microsoft's "Bing" search engine as the exclusive algorithmic and paid search platform on its O&O websites. In addition, the Company agreed to become the exclusive worldwide relationship sales force for premium search advertising customers and to rely on Microsoft's AdCenter platform for the fulfillment of self-serve advertising sales.

In exchange, Microsoft will compensate the Company through a revenue sharing agreement and certain cost reimbursements. Under the terms of the revenue sharing agreement, the Company is entitled to receive 88.0% of the net revenue generated from Microsoft's services on its O&O and Affiliate (after deducting the Affiliate's revenue share) websites for the first five years of the Search Agreement.[1] In addition, Microsoft agreed to reimburse the Company for up to $150.0 million of transition costs during the first three years of the Search agreement and for certain algorithmic and paid search service operating costs incurred over the implementation period. The Company began implementation of the agreement on 02/23/10 and expects that the implementation period will last up to two years. Revenue sharing is expected to begin in late 2010. The term of the Search and License Agreements is ten years.

In its 07/29/09 Press Release, the Company stated that, upon full implementation, the Search and License Agreements were expected to result in a $500.0 million annual benefit to operating income and $200.0 million of annual capital expenditure (capex) savings. Subsequently, at its 10/28/09 Analyst Day, the Company guided for FY 12 operating margin of 15.0-20.0%, representing a significant improvement relative to the 6.0% operating margin achieved in FY 09.

> At full implementation (expected to occur within 24 months following regulatory approval), Yahoo! estimates, based on current levels of revenue and current operating expenses, that this agreement will provide a benefit to annual GAAP operating income of approximately $500 million and capital expenditure savings of approximately $200 million. (07/29/09 Press Release)

Rebound in display advertising: In Q1 10, O&O display revenue increased 19.7% (y/y) to $444.0 million, representing the first year-over-year increase in at least four quarters. On its 04/20/10 Q1 10 Conference Call, the Company attributed the rebound to increased sales of guaranteed display inventory, which is typically purchased by large advertisers. In addition, the Company represented that it held the market leading position in display advertising. Subsequently, on 05/13/10, comScore, Inc. (SCOR), a leading provider of digital marketing intelligence, issued a Press Release representing that Q1 10 Total

[1] On the fifth anniversary of the date of implementation, the revenue share rate will increase to 90.0% for the remaining term of the Search Agreement unless Microsoft exercises an option to terminate the Company's sales exclusivity for premium search advertisers. If Microsoft exercises the option, the revenue share rate will increase to 93.0%. If the Company exercises an option to reinstate sales exclusivity, the revenue share rate will decline to 83.0%.

Display Ad Impressions in the U.S. increased 15.4% (y/y) to 1.1 trillion.[2] As the market leader in display advertising, the Company may be well-positioned to benefit from a rebound in display advertising spending.

> The headline news is that display advertising grew 20% year over year, ahead of the market. More importantly, ***guaranteed display grew by 24% as large advertisers came back.*** That means their purse strings are starting to loosen up. A lot of them have been lying dormant, or only doing the minimum. And as the economy does better, they're re-emerging to aggressively position their brands online. ***As the market leader in display, we're well-positioned to benefit from this trend.*** (CEO, President, and Director Ms. Carol Bartz, Q1 10 Conference Call) [emphasis added]

Revenue Analysis ($ in millions)	Q1 10	Q4 09	Q3 09	Q2 09	Q1 09
O&O search	$343.0	$370.0	$354.0	$359.0	$399.0
Year-over-year change	*(14.0%)*	*(15.1%)*	*(19.2%)*	*(15.3%)*	*(2.7%)*
O&O display	$444.0	$503.0	$399.0	$393.0	$371.0
Year-over-year change	*19.7%*	*(0.6%)*	*(8.3%)*	*(14.0%)*	*(12.9%)*
O&O listings and other marketing services	$88.0	$98.0	$98.0	$106.0	$102.0
Year-over-year change	*(13.7%)*	*(18.3%)*	*(24.6%)*	*(21.5%)*	*(21.5%)*
Affiliate	$548.0	$564.0	$526.0	$520.0	$511.0
Year-over-year change	*7.2%*	*6.0%*	*(6.2%)*	*(8.9%)*	*(15.8%)*
Total marketing services revenue	$1,423.0	$1,535.0	$1,377.0	$1,378.0	$1,383.0
Year-over-year change	*2.9%*	*(3.7%)*	*(12.0%)*	*(13.2%)*	*(12.1%)*

Growth opportunity in local business advertisements: On 07/21/09, the Company and AT&T Interactive announced an agreement whereby AT&T Interactive would begin to sell the Company's display inventory in the summer of 2009.[3] In its 07/21/09 Press Release, the Company represented that the total size of the local online advertising market was $14.0 billion. In addition, on its Q2 09 Conference Call, the Company represented that local advertisers are an important growth area for the Company.

> **Analyst:** Hey, Carol. I'm just trying to get a, drill down a bit more on the advertiser dynamics between Tier 1 and Tier 2. Can you just talk a little bit about maybe how the growth in Tier 2 is breaking down? Is it Tier 1 one customers reallocating spend or is it new customers coming in or maybe existing Tier 2 customers lifting their spend?
>
> **CEO, President, and Director Ms. Carol Bartz:** Well, we certainly have – I mean, we don't actually break this down and we don't reallocate between the two. But in fairness to your question, your exact question, it's both. I mean, there are tier, there are those people who are experimenting more with non-guaranteed that were only guaranteed before and there are new customers coming in with guaranteed. It's just that – and the mid – by the way, by getting a lot more into mid market like small and medium business, and the local business it's – that's going to focus a lot on people not buying guaranteed but buying non-guaranteed because that's their first sort of online experience. So we just see it as a very, very important growth sector where

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[2] comScore, Inc. *Americans Received 1 Trillion Display Ads in Q1 2010 as Online Advertising Market Rebounds from 2009 Recession.* 13 May 2010. Web. 13 May 2010. <http://www.comscore.com/Press_Events/Press_Releases/2010/5/Americans_Received_1_Trillion_Display_Ads_in_Q1_2010_as_Online_Advertising_Market_Rebounds_from_2009_Recession>.

[3] AT&T Interactive is a subsidiary of AT&T responsible for the sale of marketing services to local businesses. The Company maintains a strategic alliance with AT&T pursuant to which the Company's technologies power AT&T's internet portal and e-mail services.

frankly, important advertisers like the newspapers and like the big announcement today with AT&T, can sell into a local, very relevant ad space. (Q2 09 Conference Call, 07/21/09)

Valuation: The Company's shares trade approximately in-line with peers on a forward price-to-earnings basis.

Peer Valuation Analysis	Forward P/E As of 05/25/10
Yahoo! Inc. (YHOO)	22.0
AOL Inc. (AOL)	10.5
Baidu, Inc. (BIDU)	46.1
Google Inc. (GOOG)	16.1
IAC/InterActiveCorp (IACI)	24.6
Microsoft Corporation (MSFT)	11.6
Peer group average	21.8
% YHOO above (below) peer group average	*1.0%*

Voyant's Earnings Risk Assessment

We are concerned about revenue and earnings sustainability given evidence of intensifying competitive landscape challenges, an increase in traffic acquisition costs, a decline in deferred revenue, and a divergence between pro forma cash from operations and pro forma non-GAAP net income. In addition, we believe a change in the Company's Executive Incentive Plan performance targets may have provided motivation for the Company to engineer strong earnings. We are initiating coverage of Yahoo! Inc. with an Earnings Risk Assessment score of 9.

Impact of Click Fraud, Social Networking

Background on click fraud: Click fraud refers to an abuse of the CPC pricing model whereby an end-user artificially increases the amount of clicks registered on a particular advertisement. The motivations for click fraud include the generation of CPC advertising fees by operators of affiliate websites and the skewing of an entity's advertising campaign by a competitor. Incidents of click fraud can reduce return on investment for the Company's customers, thereby potentially making the Company's properties less-attractive to advertisers.

Increased competition from social networking sites: While the Company's primary competitors are Google, AOL Inc. (AOL), and Microsoft, it also competes with traditional providers of media-related content, such as newspapers, television networks, and operators of social networking websites including Facebook, Inc. and MySpace, Inc.[4] In its Q1 10 10Q, the Company represented that social networking sites attracted a larger share of the time spent by end-users online.

> We further compete for users, advertisers and developers with social media and networking sites such as Facebook.com as well as the wide variety of other providers of online services. ***Social networking sites in particular are attracting a substantial and increasing share of users and users' online time, which could enable them to attract an increasing share of online advertising dollars.*** (Q1 10 10Q) [emphasis added]

We have the following observations about the competitive threat from social networking sites:

1. **Evidence of a lower rate of click fraud on social networks:** On 04/08/10, ClickForensics, Inc., a provider of online audience verification and traffic quality management solutions, released its Q1 10 Click Fraud Report which contained click fraud rate data collected from a cross-section of advertiser and third-party ad network online CPC advertising campaigns. According to the Report, the Q1 10 industry average of click fraud rate increased 360 (210) basis points (bps) on a year-over-year (sequential) basis to 17.4%. In addition, the click fraud rate for social networking websites was 11.5% in Q1 10, 590 bps below the industry average. Given that a lower rate of click fraud may translate into a higher return on investment for advertisers, we believe the Company may lose market share as advertisers shift a greater portion of their spending to social networking websites.

2. **Concerns about competition from Facebook:** In a 05/12/09 Press Release, comScore stated that the Company ranked as the top US display ad publisher in the month of March 2009. In March of 2009, the Company maintained a 13.2% market share, while Facebook maintained a 7.7% market share.[5] Subsequently, in its 05/13/10 Press Release, comScore stated that Facebook was the top US display ad publisher in Q1 10. In Q1 10, Facebook maintained a 16.2% market share with 176.3 billion display

[4] Facebook, Inc. is a privately-held entity, and MySpace, Inc. is a subsidiary of News Corporation (NWSA).
[5] ComScore, Inc. *Yahoo! Sites Ranks as Top Display Ad Publisher in March with 43 Billion U.S. Ad Views, According to ComScore Ad Metrix.* 12 May 2009. Web. 13 May 2010. <http://www.comscore.com/Press_Events/Press_Releases/2009/5/ Yahoo!_Ranks_Top_Display_Ad_Publisher>.

ad impressions, while the Company maintained a 12 1% market share with 131 6 billion display ad impressions [6]

In addition, on 02/18/10, Facebook and Paypal, the global online payment processing division of eBay Inc (EBAY), announced a strategic relationship to offer Paypal in key parts of Facebook's advertising and developer systems Facebook expects the relationship to facilitate the creation of ad campaigns by small international advertisers Given the expansion of Facebook's market share in the US online display advertising market, we are concerned about the Company's ability to maintain its competitive position in the marketplace

> As part of the relationship, advertisers around the world will soon be able to use PayPal to pay for Facebook Ads through the company's online advertising tool ***For businesses in areas where the payment process can be difficult and expensive, the option to pay with PayPal makes it even easier for advertisers, particularly small international companies, to run campaigns on Facebook.*** Facebook reaches more than 400 million people, 70 percent of whom live outside the United States (Facebook, 02/18/10 Press Release) [emphasis added]

Company at a Competitive Disadvantage in Mobile Advertising, In Our View

The mobile advertising market represents a small but growing portion of the overall online advertising industry Mobile advertising opportunities include text message, internet search, and mobile application (app) website display advertisements Given the prospects for growth in the mobile advertising industry, certain competitors have announced initiatives in the space

On 04/08/10, Apple Inc (AAPL) introduced iPhone OS 4, an updated mobile operating system for use in its iPhone, iPod Touch, and iPad devices A key feature of the new mobile operating system is iAd, a new mobile advertising platform that allows developers to embed advertisements within apps In its 04/08/10 Press Release, Apple stated that it intends to sell and serve the iAd advertisements and that developers would be compensated through a 60 0% revenue sharing agreement iPhone OS 4 is expected to become available for the iPhone and iPod Touch in the summer of 2010 and for the iPad in the fall of 2010

> iAd, Apple's new mobile advertising platform, combines the emotion of TV ads with the interactivity of web ads Today, when users click on mobile ads they are almost always taken out of their app to a web browser, which loads the advertiser's webpage Users must then navigate back to their app, and it is often difficult or impossible to return to exactly where they left iAd solves this problem by displaying full-screen video and interactive ad content without ever leaving the app, and letting users return to their app anytime they choose iPhone OS 4 lets developers easily embed iAd opportunities within their apps, and the ads are dynamically and wirelessly delivered to the device Apple will sell and serve the ads, and developers will receive an industry-standard 60 percent of iAd revenue (AAPL 04/08/10 Press Release)

On 05/21/10, Google received regulatory clearance to acquire AdMob, Inc , a privately-held mobile display advertisement technology provider that will enable Google to embed advertisements within mobile applications In its 05/21/10 Press Release, Google highlighted its expectation for growth in the mobile advertising industry and stated it was working to close the acquisition

> As mobile phone usage increases, ***growth in mobile advertising is only going to accelerate.*** This benefits mobile developers and publishers who will get better advertising solutions, marketers who will find new ways to reach consumers, and users who will get better ads and more free content We're very excited about the possibilities in this field As an immediate matter, we're now moving to close this acquisition in coming weeks We'll then start work right

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[6] comScore, Inc *Americans Received 1 Trillion Display Ads in Q1 2010 as Online Advertising Market Rebounds from 2009 Recession* 13 May 2010 Web 13 May 2010
<http //www comscore com/Press_Events/Press_Releases/2010/5/Americans_
Received_1_Trillion_Display_Ads_in_Q1_2010_as_Online_Advertising_Market_Rebounds_from_2009_Recession>

away on bringing AdMob's and Google's teams and products together. This industry is moving fast, and we're excited to be part of the race! (GOOG, 05/21/10 Press Release) [emphasis added]

We believe the Company is at a competitive disadvantage given that it does not offer a mobile operating system like that of Apple's iPhone OS or Google's Android. Accordingly, we are concerned about the sustainability of revenue as advertisers may shift their budgets in favor of mobile initiatives. Further, as competitors bundle their mobile and traditional web offerings, we are concerned about pricing pressure and the sustainability of margin.

Background on Revenue Recognition and Traffic Acquisition Costs

The Company recognizes revenue from display advertising as ad impressions appear in web pages viewed by end-users. In its Q1 10 10Q, the Company represented that display advertising contracts have terms ranging from one to three years. Search advertising revenue is recognized when an end-user clicks on an advertiser's search listing result. Listings and fee revenue are recognized when services are performed, while transaction revenue is recognized when there is evidence that a qualifying transaction has occurred. Deferred revenue is comprised of contractual billings and payments received from customers in advance of revenue recognition.

Multiple element arrangements: Revenue from customized display advertising solutions, which contain standard display advertising and other services such as customer ad campaign analysis, is recognized in accordance with ASC 605-25, "Revenue Recognition – Multiple Element Arrangements." Pursuant to ASC 605-25, the Company divides the revenue stream into separate units of accounting based upon estimated stand-alone selling prices. The Company recognizes revenue from each unit of accounting in a manner consistent with the economics of the underlying transaction.

Affiliate revenue and TAC: For search and/or display advertising revenue generated on Affiliate websites, the Company pays its Affiliates (referred to as "traffic acquisition costs" or "TAC"). Affiliate revenue is recognized on a gross basis, while TAC is expensed as cost of revenue pursuant to the terms of the Affiliate agreement. In its Q1 10 10Q, the Company represented that TAC was typically expensed on a ratable basis for fixed-length and fixed-payment agreements and/or at a variable rate for revenue sharing agreements based on metrics such as number of searches or paid clicks.

Mixed Q1 10 Results, Increasing TAC May Pressure Gross Margin, In Our View

Background on ad quality initiatives: In FY 08, the Company implemented certain initiatives to improve the quality of its Affiliate network. Subsequently, in Q2 09, the Company announced it planned to implement similar quality initiatives for its O&O websites (ad quality initiatives hereinafter). On its Q2 09 Conference Call, the Company represented it would decrease ad frequency or remove certain ads from its O&O websites. The Company guided for the ad quality initiatives to have a $75.0 million negative impact on quarterly revenue ($300.0 million annualized).

> The second initiative around improving the ad experience is similar to what we've done to optimize user relevance and monetization with ads on our search affiliate network. ***We're now focusing on O&O search and display ads, improving relevancy, decreasing the frequency of some ads and potentially eliminating others.*** All of this is specifically designed to raise user satisfaction. Better ad relevance increases user engagement and better user engagement delivers more ROI to advertisers. ***We expect this effort to take approximately 75 million of revenue out of our quarterly baseline.*** It's important to put these numbers in perspective, especially in contrast to the billions in advertising revenue we generate. We're confident these are the right moves to get us on the best path for better user experience and engagement and therefore growth and profit for the long-term. While we clearly have our challenges, and what company doesn't these days, we have a lot to be proud of. People come to us in massive numbers because there's

so much we do right and our users actually know it. (CEO, President, and Director Ms. Carol Bartz, Q2 09 Conference Call, 07/21/09) [emphasis added]

Q1 10 results: On 04/20/10, the Company reported Q1 10 non-GAAP revenue (non-GAAP loss) of $1,130.4 million ($0.15).[7] Q1 10 non-GAAP revenue was 3.4% ($39.5 million) below the consensus estimate, while non-GAAP earnings, excluding a $0.02 non-recurring tax benefit, were 30.0% ($0.03) above the consensus estimate. The Company guided for Q2 10 non-GAAP revenue of $1,155.0 million at midpoint, 2.5% below the consensus estimate of $1,184.3 million.

We have the following observations about the Company's Q1 10 results:

1. **Weaker-than-expected O&O search revenue:** In its FY 09 10K, the Company guided for Q1 10 marketing services revenue from its O&O websites to increase on a year-over-year basis and for Q1 10 revenue from its Affiliate websites to remain flat on a year-over-year basis. We note, however, that Q1 10 revenue from the Company's O&O websites was flat on a year-over-year basis, while Affiliate revenue increased 7.2%. On its Q1 10 Conference Call, the Company attributed the lack of growth in O&O revenue to weaker-than-expected O&O search revenue, which declined 14.0% (y/y) to $343.0 million.

   We currently expect marketing services revenues on our Owned and Operated sites to increase for the first quarter of 2010 compared to the first quarter of 2009 provided global economic conditions continue to improve and advertising spending increases. (FY 09 10K)

   We expect marketing services revenues from Affiliate sites for the first quarter of 2010 to remain relatively flat compared to the first quarter of 2009 as we continue to implement our ongoing advertiser quality initiatives. (FY 09 10K)

   In terms of your second question on results with O&O flat, what ended up happening is we saw some good strength in display, basically as expected. ***Search was a little bit weaker than we expected, primarily based on the volume.*** From what I've read, anyway, the whole market was a little bit slower paced in first quarter than we'd anticipated. So even though we a little bit underperformed the market in January and February, share stabilized in March. But for the whole industry, from what I've read, the volume query growth was no great shakes. So that was definitely part of it, and then of course affiliates picked up a little bit to obscure some of that mix. And that's basically kind of the math of it. (CFO and EVP Mr. Timothy R. Morse, Q1 10 Conference Call) [emphasis added]

[7] Non-GAAP revenue excludes TAC. Non-GAAP earnings exclude restructuring charges, transition cost reimbursements from Microsoft, and other non-recurring items.

Revenue Analysis ($ in millions)	Q1 10	Q4 09	Q3 09	Q2 09	Q1 09
O&O search	$343.0	$370.0	$354.0	$359.0	$399.0
Year-over-year change	*(14.0%)*	*(15.1%)*	*(19.2%)*	*(15.3%)*	*(2.7%)*
O&O display	$444.0	$503.0	$399.0	$393.0	$371.0
Year-over-year change	*19.7%*	*(0.6%)*	*(8.3%)*	*(14.0%)*	*(12.9%)*
O&O listings and other marketing services	$88.0	$98.0	$98.0	$106.0	$102.0
Year-over-year change	*(13.7%)*	*(18.3%)*	*(24.6%)*	*(21.5%)*	*(21.5%)*
Total O&O revenue	$875.0	$971.0	$851.0	$858.0	$872.0
Year-over-year change	*0.3%*	*(8.6%)*	*(15.2%)*	*(15.6%)*	*(9.7%)*
Affiliate	$548.0	$564.0	$526.0	$520.0	$511.0
Year-over-year change	*7.2%*	*6.0%*	*(6.2%)*	*(8.9%)*	*(15.8%)*
Total marketing services revenue	$1,423.0	$1,535.0	$1,377.0	$1,378.0	$1,383.0
Year-over-year change	*2.9%*	*(3.7%)*	*(12.0%)*	*(13.2%)*	*(12.1%)*

2. **Increase in TAC may pressure gross margin, in our view:** In Q1 10, TAC increased 10.1% (y/y) in absolute terms and 240 basis points (bps) relative to GAAP revenue. In its Q1 10 10Q, the Company attributed the increase in TAC to higher Affiliate revenue, foreign exchange rate fluctuations, a change in Affiliate mix, and the addition of a new international Affiliate. We note, however, that Q1 09 TAC increased 120 bps relative to revenue. On its Q2 09 Conference Call and in its FY 09 10K, the Company represented that TAC rates on new Affiliate deals increased. ***We are concerned about the sustainability of gross margin given the trend in TAC rates.***

   TAC increased $43 million for the three months ended March 31, 2010, compared to the same period in 2009. The increase was primarily driven by the impact of foreign exchange rate fluctuations, changes in Affiliate partner mix, a new International Affiliate partner, and increases in revenues from Affiliate sites. (Q1 10 10Q)

   Traffic acquisition cost was 28% of total GAAP revenue, TAC rates continued to rise slightly year-over-year as a result of ***higher TAC on new deals*** and the mix of affiliate revenue during the quarter. (CFO and EVP Mr. Timothy R. Morse, Q2 09 Conference Call, 07/21/09) [emphasis added]

   TAC decreased $32 million for the year ended December 31, 2009, compared to 2008. The decrease was primarily driven by the impact of foreign currency rate fluctuations, offset by changes in Affiliate mix and a ***small increase in average TAC rates.*** (FY 09 10K) [emphasis added]

TAC Analysis ($ in millions)	Q1 10	Q4 09	Q3 09	Q2 09	Q1 09
GAAP revenue – US	$1,120.7	$1,230.9	$1,143.2	$1,152.4	$1,187.9
GAAP revenue – International	$476.3	$501.0	$432.2	$420.5	$392.1
GAAP revenue – total	$1,597.0	$1,732.0	$1,575.4	$1,572.9	$1,580.0
TAC – US	$277.8	$304.0	$294.7	$290.5	$290.1
TAC – International	$188.7	$169.5	$149.3	$146.0	$133.7
TAC – total	$466.5	$473.5	$444.0	$436.6	$423.8
TAC as % revenue – US	24.8%	24.7%	25.8%	25.2%	24.4%
Year-over-year change (in bps)	*40*	*290*	*330*	*380*	*320*
TAC as % revenue – International	39.6%	33.8%	34.5%	34.7%	34.1%
Year-over-year change (in bps)	*550*	*390*	*30*	*90*	*(260)*
TAC as % revenue – Total	29.2%	27.3%	28.2%	27.8%	26.8%
Year-over-year change (in bps)	*240*	*350*	*240*	*260*	*120*
Gross margin	55.8%	56.7%	55.0%	54.7%	55.7%
Year-over-year change (in bps)	*10*	*(290)*	*(180)*	*(270)*	*(280)*

We Are Concerned About the Sustainability of Revenue

Decline in deferred revenue: In Q1 10, total deferred revenue declined 24.1% (y/y) to $453.6 million, while GAAP revenue increased 1.1% to $1,597.0 million. Accordingly, total deferred revenue-to-revenue declined 24.9% (y/y) to 0.284.

Deferred Revenue Analysis ($ in millions)	Q1 10	Q4 09	Q3 09	Q2 09	Q1 09
GAAP revenue	$1,597.0	$1,732.0	$1,575.4	$1,572.9	$1,580.0
Current deferred revenue	$351.8	$411.1	$413.4	$416.7	$405.6
Long-term deferred revenue	$101.8	$122.6	$144.5	$167.7	$192.3
Total deferred revenue	$453.6	$533.7	$557.9	$584.3	$597.9
Current deferred revenue-to-revenue	0.220	0.237	0.262	0.265	0.257
Year-over-year change	*(14.2%)*	*3.8%*	*5.0%*	*(0.4%)*	*(5.9%)*
Long-term deferred revenue-to-revenue	0.064	0.071	0.092	0.107	0.122
Year-over-year change	*(47.6%)*	*(41.5%)*	*(33.5%)*	*(30.6%)*	*(28.0%)*
Total deferred revenue-to-revenue	0.284	0.308	0.354	0.372	0.378
Year-over-year change	*(24.9%)*	*(11.9%)*	*(8.7%)*	*(11.5%)*	*(14.4%)*

In addition, we note that the sequential decline in Q1 10 current deferred revenue was $59.3 million, ***representing the largest sequential decline in at least three years***. Further, the sequential decline in long-term deferred revenue was $20.8 million, $5.3 million less than the $26.1 million sequential decline in Q1 09.

Deferred Revenue Analysis ($ in millions)	Q1 10	Q4 09	Q3 09	Q2 09	Q1 09
Current deferred revenue	$351.8	$411.1	$413.4	$416.7	$405.6
Absolute sequential change	($59.3)	($2.3)	($3.2)	$11.0	($7.6)
Long-term deferred revenue	$101.8	$122.6	$144.5	$167.7	$192.3
Absolute sequential change	($20.8)	($21.9)	($23.2)	($24.6)	($26.1)
Total deferred revenue-to-revenue	$453.6	$533.7	$557.9	$584.3	$597.9
Absolute sequential change	($80.1)	($24.2)	($26.5)	($13.6)	($33.7)

We have the following observations about the decline in deferred revenue:

1. **Potentially unsustainable benefit to Q1 10 revenue:** On its Q1 10 Conference Call, the Company represented that revenue was negatively impacted by $30.0 million as a result of the ad quality initiatives announced in Q2 09. The $30.0 million negative impact was $12.5 million less than the Company's previous guidance from the 01/26/10 Q4 09 Conference Call. The negative impact from the ad quality initiatives has been less than the Company's guidance in each quarter following the Q2 09 announcement. In Q4 09, the Company represented that the ad quality initiatives were expected to result in an annualized negative impact of $175.0 million at midpoint, significantly lower than the previous guidance of $300.0 million from the 07/21/09 Q2 09 Conference Call.

In Q3 09 and Q4 09, the Company attributed the lower-than-expected revenue impact, in-part, to larger amounts of offsetting advertisement sales. We note that current deferred-revenue-to-revenue ***increased*** in Q3 and Q4 09. ***Given the significant decline in current deferred revenue in Q1 10, we believe the Company was not able to offset contract losses related to its ad quality initiatives.*** Accordingly, we believe the Company realized an unsustainable top-line benefit from the $59.3 million sequential decline in current deferred revenue.

Further, on its 10/20/09 Q3 09 Conference Call, the Company represented that the ad quality initiatives were implemented at a slower-than-expected pace. Given that the negative revenue impact from the ad quality initiatives was $12.5 million lower than the Company's guidance and that the annualized run rate of $120.0 million was 31.4% below the Company's guidance, ***we believe the Company may have delayed certain ad quality initiatives to enhance its Q1 10 results.***

Revenue Analysis ($ in millions)	Q1 10	Q4 09	Q3 09	Q2 09
Guidance – revenue impact Q_{t+1}	--	($42.5)	($25.0)	($50.0)
Actual revenue impact	($30.0)	($12.5)	($15.0)	--
Difference vs. guidance	$12.5	$12.5	$35.0	--
Guidance – annualized revenue impact	--	$150.0 - $200.0	$240.0	$300.0

> On search, the impact of the various cleanups, including paid inclusion, is ***roughly $30 million*** year over year. On display – oh, and as far as the total year, we're going to continue to take it quarter by quarter, and we'll see how the year unfolds. (CFO and EVP Mr. Timothy R. Morse, Q1 10 Conference Call) [emphasis added]

> Revenue from guaranteed placements grew sequentially in the mid-single digit range as a result of better overall yield. The non-guaranteed side of our business declined sequentially due to our ad quality initiatives but still grew 37% year-over-year. We originally estimated that the revenue impact of the ad quality initiatives would be $75 million on a full quarter basis and roughly 50 million unfavorable in third quarter. ***Instead, the unfavorable 3Q impact was $15 million as a result of slower implementation and better backfill of the low quality ads at***

higher than expected rates. Panning out to the bigger picture we expect the impact of this initiative to grow to $25 million, in fourth quarter and level out at 60 million quarterly by the beginning of 2010. That would put the annual unfavorable impact at roughly $240 million instead of our original 300 million estimate. (CFO and EVP Mr. Timothy R. Morse, Q3 09 Conference Call, 10/20/09) [emphasis added]

So what we had originally guided to was third quarter was about 15 going to 25 of the ad quality initiatives. ***Instead of the 25, I'd say it came in less than half that.*** The plain truth is we had great backfill. You saw it in both our guaranteed and our nonguaranteed side so I think that worked out really well. We had also previously guided that we'd go from 25 in the fourth quarter to 60. I think we will invest about 35 more of impact for the last installment of these initiatives. I think it's probably a little bit less than that, but probably still in that ***30 range from fourth quarter to first quarter.*** So overall I'd say because of the backfill, because some of this investment is bearing fruit a little more quickly than we had even hoped, that I'd say the total impact of these initiatives instead of 240 million, I'd put it at well south of 200, maybe even something like 150. (CFO and EVP Mr. Timothy R. Morse, Q4 09 Conference Call) [emphasis added]

2. **Decline in long-term deferred revenue heightens our revenue sustainability concerns:** In Q1 08, the Company received a $350.0 million one-time payment from AT&T related to the conversion of its broadband relationship with AT&T into a revenue-sharing agreement. In its FY 08 10K, the Company disclosed that the payment was recorded as deferred revenue. On its Q3 08 Conference Call, the Company represented that revenue related to the payment would decline over several years. Given that long-term deferred revenue declined 47.1% (y/y) in absolute terms, and that the conversion rate (long relative to short term) declined year-over-year, ***we believe that deferred revenue related to the AT&T agreement has been significantly depleted and/or that customers may have elected shorter contract terms.*** Accordingly, our revenue sustainability concerns are heightened.

   First, the fees revenue from our broadband partners is no longer growing and will in fact decline over time. The upfront payments received from AT&T and Rogers will allow us to recognize some fee revenue from our broadband relationships though this revenue source will decline over the next several years. (Former CFO Mr. Blake Jorgensen, Q3 08 Conference Call, 10/21/08)

We Believe Earnings Are Unsustainable

In Q1 10, pro forma cash from operations declined 15.3% (y/y) to $271.4 million, while pro forma non-GAAP net income increased 38.2%.[8] Accordingly, pro forma cash from operations-to-non-GAAP net income declined 38.7% (y/y) to 1.595. During the quarter, deferred revenue used $54.5 million of cash. Given the divergence between pro forma cash from operations and pro forma non-GAAP net income, we believe the Company's earnings are unsustainable.

Potential Motivation for Earnings Enhancements

Executive bonus targets: The Company's executive compensation program includes the payment of base salaries, annual cash bonuses based on the achievement of certain financial and individual performance metrics, and long-term equity incentive awards including stock options and restricted stock units.

In FY 09, 30.0% of executive cash bonuses were based on individual performance metrics and 70.0% were based on the achievement of "operating cash flow (OCF)," a non-GAAP financial measure defined as operating income before depreciation, amortization, stock based compensation, and certain non-recurring items. In FY 09, actual OCF was lower than the $1,825.0 billion target used to measure performance under

[8] Pro forma cash from operations excludes the cash impact of restructuring charges and accruals related to the Microsoft Search and License Agreement cost reimbursements. Pro forma non-GAAP net income was adjusted to exclude the impact of accruals related to the Microsoft Search and License Agreement cost reimbursements.

the Company's Executive Incentive Plan (EIP). As a result, the Company's named executive officers received only 75.0% of their target cash bonus.

In its FY 09 10K, the Company disclosed that the EIP performance measures were changed for FY 10. In FY 10, 70.0% of cash bonuses are linked to the achievement of certain GAAP revenue and GAAP operating income targets and 30.0% are linked to individual performance metrics. Given our concerns about potentially unsustainable benefits to Q1 10 revenue, we believe that the change in the EIP performance measures may have provided motivation for the Company to engineer strong results.

Other Observation

CEO stock option grant linked to share price performance: On 01/30/09, the Company issued Ms. Carol Bartz a stock option grant for five million shares in conjunction with her 01/13/09 appointment as CEO. The options have a strike price of $11.73 and have a contingent vesting that is based upon whether the average closing price of the Company's stock exceeds certain levels ranging from $17.60 to $35.19 for 20 consecutive trading days prior to 01/01/13. Any shares acquired by Ms. Bartz pursuant to the option must be held until 01/01/13.

Risks to Our Thesis and Conclusion

Risks to our thesis: The following developments could present challenges to our thesis:

- The Microsoft Search and License Agreements enable the Company to expand its operating margin.
- Ad initiatives result in improved advertiser return on investment and increased demand for ad inventory.
- Expansion of website content offerings results in increased end-user demand.
- Revenue and earnings increase due to the addition of new affiliates.
- The Company completes a transformative acquisition or is acquired.

Conclusion: We are concerned about revenue and earnings sustainability given evidence of intensifying competitive landscape challenges, an increase in traffic acquisition costs, a decline in deferred revenue, and a divergence between pro forma cash from operations and pro forma non-GAAP net income. In addition, we believe a change in the Company's Executive Incentive Plan performance targets may have provided motivation for the Company to engineer strong earnings. We are initiating coverage of Yahoo! Inc. with an Earnings Risk Assessment score of 9.

Earnings Risk Assessment

Earnings Risk Assessment is our subjective evaluation of potential underperformance relating to the validity and reliability of a company's earnings, cash flow, and financial position. The higher the Earnings Risk Assessment score, the greater the risk, in our view, that recent financial results may not accurately reflect potential fundamental business deterioration, competitive landscape challenges, and/or operational inefficiencies. Further, the higher the Earnings Risk Assessment score, the greater likelihood, in our view, that these issues are not yet manifested in the marketplace. An Earnings Risk Assessment score at or above 8, for example, implies a high risk of near-term earnings underperformance, in our view.

Disclaimer and Disclosure

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