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## ABSTRACT

During the dot-com bubble of the 1990s, equity market valuation was a popular topic for investors, financial analysts and academics. Some questioned whether traditional accounting and financial information had lost its value relevance, as stocks traded at multiples of earnings well in excess of historic levels, leading Alan Greenspan to caution against “irrational exuberance.” This study examines the relation between market valuation and traditional accounting/financial information before, during and after the bubble. We confirm previous research that documents a decline in the relation between market value and traditional accounting information leading up to the bubble period. However, we also document that after the collapse of the bubble in 2000 this trend reverses. We also examine two related metrics that may provide a rational explanation for this phenomenon, including the quality of earnings, and the aggressiveness of financial analysts’ forecasts, finding some support that earnings quality may contribute to the changes in value relevance, but not the aggressiveness of analyst forecasts.

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## 1. Introduction

During the dot-com bubble of the 1990s, many questioned the value of fundamental financial information for investment decision-making purposes. Stocks were trading at record multiples of earnings. In fact many companies with no earnings at all, experienced significant increases in their stock prices during the latter half of the 1990s. A number of academic studies documented a decline in the linear relationship between earnings and stock returns (e.g., Brown, Lo, & Lys, 1999; Ely & Waymire, 1999; Francis & Schipper, 1999; Lev & Zarowin, 1999). Investors called for additional information beyond the traditional financial statements based on Generally Accepted Accounting Principles (GAAP). Some argued that earnings no longer mattered and that other metrics such as number of clicks or page views were more appropriate in the new economy (Penman, 2003). Others argued that bad accounting and poor accounting standards contributed to the 1990s bull market (Krugman, 2004; Stiglitz, 2003). In response to these demands, companies began releasing so called “pro-forma” financial information that presented what the company’s financial statements would look like if they did not have to follow current

accounting guidelines. Amazon.com Inc. started the trend in the second quarter of 1998 by excluding amortization expenses on intangible assets, and was quickly followed by Yahoo! Inc. and others. By the middle of 2001, the majority of S&P 500 companies excluded some GAAP expenses when reporting financial performance in their press releases (Best, 2006). The practice became such a concern to the SEC that on December 4, 2001 it issued an advisory statement that cautioned public companies not to mislead investors, providing five propositions for guidance on the dissemination of pro-forma information (SEC, 2001).<sup>1</sup>

Penman (2003) describes the bubble period of the 1990s as a pyramiding chain letter where momentum investing displaced fundamental investing. The mood was perhaps best described by Alan Greenspan, Chairman of the Federal Reserve Board, when he cautioned against *irrational exuberance* in a speech at The American Enterprise Institute for Public Policy Research on December 5, 1996 (Greenspan, 1996). These prophetic words have been the subject of many discussions since, and they motivate our investigation of this bubble and its subsequent collapse.

<sup>1</sup> The propositions include: (1) antifraud provisions apply to pro-forma, (2) differences from GAAP and pro-forma should be clearly spelled out, (3) materiality of omitted information is important consideration, (4) companies should follow guidelines developed by the Financial Executives International and the National Investors Relations Institute for pro-forma style, and (5) investors are encouraged to compare pro-forma results to GAAP-based results.

<sup>☆</sup> Data availability: Data used in this study are available from public sources.

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Specifically, we examine the value relevance of accounting and financial information during the period of time surrounding the dot-com bubble, from 1995 to 2000. This period of time is referred to as the new economy period (NEP) by several researchers, who examine trends in value relevance leading up to this time period (e.g., Core, Guay, & Van Buskirk, 2003; Demers & Lev, 2001; Trueman, Wong, & Zhang, 2003). Our study extends these prior studies into the post dot-com bubble period by examining a broad cross-section of firm-year observations from 1989 through 2006 and a sub-sample of firms in high technology industries that are thought to be more representative of the so called “new economy firms.” We find that value relevance as measured by regression  $R^2$  decreased during the bubble period, from 1995 to 2000, consistent with prior research, but increased after the collapse of the bubble in 2000. We find similar results for both high technology and low technology sub-samples.

We also examine two related metrics as possible explanations for this phenomenon. First, we use a proxy for perceived earnings quality and find no significant difference in perceived earnings quality occurs during the dot-com bubble period, suggesting that the decline in value relevance cannot be explained by a perceived decline in the quality of financial reporting for the overall sample. However, when we split the sample between high technology and low technology firms, we find that the perception of earnings quality for high technology firms declined during the dot-com bubble period, and remained low for the next four years after the bubble collapsed. In contrast our low-tech sample reflects no change during the bubble period and improved quality perceptions following the bust, suggesting that the investing public was still apprehensive about the quality of financial reporting for the high-tech segment of the economy, but not the low-tech segment. Therefore, the overall value relevance trend, which declines during the bubble period then increases following the bursting of the bubble, can only be explained, in part, by perceived earnings quality. We also examine whether financial analysts may have contributed to the decline in value relevance during the dot-com bubble period by being overly aggressive with their forecasts. We find no evidence, of increased aggressiveness in forecasting during the bubble period. However, we do find a significant decline in aggressiveness following the bubble bursting.

The results of our study are likely to be of interest to academics, accountants, financial professionals, investors, and regulators for a number of reasons. First, the general decline in value relevance identified by the academic community in prior research appears to have stopped and reversed in the post bubble period, which to our knowledge has not been previously documented. For accounting and financial professionals, the decline in value relevance and perceived earnings quality during the dot-com bubble period followed by an increase in value relevance after the collapse should serve to encourage continued improvement in the quality of financial reporting. From the investor perspective, the results indicate that reliance on traditional accounting and financial information for investment decision making still has merit. For accounting regulators, the results provide support for resisting any call to reduce reporting standards just because certain interest groups argue that a “new economy” requires new or different information.

The remainder of the paper is organized as follows: Section 2 reviews prior research and develops our hypotheses, Section 3 discusses research methods and models used in the study, Section 4 summarizes the sample selection process, Section 5 presents the empirical results, and Section 6 summarizes results and offers some conclusions and opportunities for future research.

## 2. Prior research and hypotheses development

### 2.1. Prior research

The demand for additional information by investors during the 1990s motivated a number of academic studies that demonstrate a decline in the linear relationship between earnings and stock returns (e.g., Brown et al., 1999; Ely & Waymire, 1999; Francis & Schipper, 1999; Lev & Zarowin, 1999). These value relevance studies typically use regressions of returns on earnings, finding that the slope coefficients and  $R^2$ s decline over time. Ryan and Zarowin (2003) investigate two explanations for this decline, lag and asymmetry, finding that annual earnings reflect news with a lag relative to stock prices, and that earnings reflect good and bad news in an asymmetric fashion. Sinha and Watts (2001) use an analytical model to argue that an increase in alternate sources of information, either indirectly through financial analysts or directly from companies due to increased pressure from regulators, may be contributing to the decline in relevance of financial reports. Core et al. (2003) study a broad sample of firms from 1975 to 1999 to explore whether, and to what extent, traditional proxies for future cash flows are relevant for explaining equity values of firms operating in the so called “new economy period.” They find mixed support for their hypothesis that the new economy period is characterized by significant changes in the relation between equity values and traditional explanatory variables.

A growing literature also examines the role of Internet companies during the 1996–2000 stock market bubble. Keating, Lys, and Magee (2003) investigate the decline in value of Internet firms in the spring of 2000 and conclude that stock prices during the period are explained more by revised investor assessments of annual report data than by any new information. Lewellen (2003), in a discussion of the Keating et al. (2003) paper, argues that the results tell more about investor perceptions or misperceptions than they tell about the underlying economics of Internet firms. He argues that the market was irrational at that time, and offers evidence that prices were too high. In another new economy study that focused on anomalous stock returns around earnings announcements by Internet firms, Trueman et al. (2003) find little evidence to suggest that returns can be explained either by earnings news disclosed or by risk changes, suggesting some level of irrationality in the pricing of Internet stocks. Ofek and Richardson (2003) demonstrate that the market valuation of Internet companies was higher during the bubble period because of the market’s limited ability to short Internet stocks. Cooper, Khorana, Osobov, Patel, and Rau (2005) find that internet-related firms that change their name by adding a dot-com during the boom and removing it after the bust experience large gains in shareholder wealth. Pastor and Veronesi (2006) argue that the Internet Nasdaq bubble during the late 1990s was not irrational but it was a result of high volatility of stock prices due to uncertainty about average future firm profitability. Bharath and Viswanathan (2006) report that U.S. publicly traded Internet firms lost nearly \$428 billion during the March–December 2000 period as a result of the bubble burst. These studies suggest the importance and contribution of Internet firms to the stock market bubble of the 1990s.

More recent research examines other issues related to bubbles. For instance, Leger and Leone (2008) find departures from fundamental pricing during the bubble in the UK and that consumer confidence is a strong explanatory variable in the pre-bubble period. Louis and Eldomiaty (2010) use the Dow Jones and NASDAQ indices to test the robustness of Binswanger’s (2004a,b,c) findings that US stock price movements after the 1982 debt crisis are mainly governed by non-fundamental shocks. They conclude that US stock prices are mostly governed by speculative bubbles or irrational

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