

# **PRO FORMA EARNINGS AND EXECUTIVE COMPENSATION IN HIGH- VERSUS LOW-TECH FIRMS**

**Essam Elshafie\***

**Pervaiz Alam&**

## **Abstract**

We use a sample of actual pro forma earnings announcements to extend prior research by examining whether the informativeness of pro forma earnings is affected by the industry membership. We also examine the association between executive compensation and pro forma earnings. The results suggest that pro forma earnings are more value relevant in high-tech industries. In addition, we find that executive compensation is more sensitive to pro forma earnings relative to GAAP earnings, especially in low-tech industries. Finally, we find weak evidence that the association between pro forma earnings and executive compensation is stronger for low-tech firms relative to high-tech firms.

## **INTRODUCTION**

Pro forma earnings, often called “street” earnings in the financial press, are GAAP earnings (actual and NOT forecasted), adjusted for items that management deems to be “unusual” or “non-recurring.” Increasingly, companies are reporting this nonstandard profitability measure in the same press release with

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\* Northeastern Illinois University

& Kent State University

their standard GAAP earnings figure (Bradshaw and Sloan 2002). Prior research investigates the informativeness of financial measures in a variety of contexts. Several studies examine accounting-based and market-based measures in terms of their ability to assess shareholders value and their association with executive compensation. Kothari (2001) indicates that performance measures that have evolved in an unregulated environment are more likely to be incrementally informative than those mandated by regulation. This study focuses on one of these measures, the pro forma earnings.

Research that investigates pro forma earnings shows its increasing relevance and informativeness relative to GAAP earnings. Lougee and Marquardt (2004) find that pro forma earnings figures have greater relative and incremental information content and a greater ability to predict future operating performance and returns when the GAAP earnings quality is low and when earnings surprises are positive. However, and as a response to concerns that pro forma earnings can mislead investors, Sarbanes-Oxley Act of 2002,<sup>1</sup> section 401 (b) directed the SEC to issue rules providing that pro forma earnings shall be presented in a manner that is not misleading, and to be reconciled with GAAP measures. As directed by the Sarbanes Oxley Act, the SEC adopted new disclosure regulation, regulation G, effective March 28, 2003.

The first objective of this study is to investigate the effect of the industry membership on the informativeness of pro forma earnings. Even though Francis and Schipper (1999) find no consistent differences in the value relevance of GAAP earnings between high- and low-tech firms, other studies such as Collins et al. (1997) and Lev and Zarowin (1999) show that GAAP earnings are less relevant in high-tech industries. Lougee and Marquardt (2004), therefore, suggest that high-tech firms are more likely to disclose pro forma earnings because GAAP earnings are relatively

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<sup>1</sup> On July 30, 2002, President Bush signed into law the Sarbanes-Oxley Act of 2002. (<http://www.sec.gov/about/laws.shtml>)

less informative for these industries. We follow a classification similar to that used by Francis and Schipper (1999) to categorize firms into high-tech and low-tech firms, we then examine two issues; first, whether the popularity of pro forma earnings among high-tech firms managers is translated into stronger market response to pro forma earnings in high-tech industries. Second, whether there is a difference in the value relevance between pro forma earnings and GAAP earnings in high-tech and low-tech industries.

The second objective of this study is to investigate the association between pro forma earnings and executive compensation. Three motivations initiated our interest in addressing the association between pro forma earnings and executive compensation. First, is to examine the implications of Bloomfield (2002) Incomplete Revelation Hypothesis (IRH). According to the IRH, statistics which are more costly to extract from public data are less completely revealed in market prices. Bloomfield explains that managers prefer high stock prices and high stock returns for their firms. High prices and high returns increase the value of their compensation and the chances of retaining their current job. Therefore, managers may make decisions motivated, at least partly, by a desire to make it harder for investors to uncover information that they do not want to affect their firms' stock prices. Among these decisions, Bloomfield identifies the announcements of pro forma earnings numbers. Therefore, for pro forma announcing firms, the association between compensation and pro forma earnings might be stronger than the association between compensation and GAAP earnings.

Second, Holmstrom (1979) indicates that a performance measure will only be included in a portfolio of performance measures if it has incremental information content over and above the other available measures. Thus, in the agency literature, the primary criterion for incorporating signals into a compensation contract is the informativeness of the signals with respect to an agent's actions (Pavlik et al. 1993). Since the results of prior studies (e.g., Bhattacharya et al. 2003) show that pro forma

earnings are more informative relative to GAAP earnings; the association of executive compensation with pro forma earnings is expected to be stronger than its association with GAAP earnings.

Third, some companies include pro forma earnings, explicitly, as a performance measure in their executive compensation contract. Among these companies is Delphi Financial Group. Page 10 of their proxy statement, filed on April 15<sup>th</sup> 2003, describes their compensation plan:

The performance objectives may vary from individual to individual and will be based upon one or more of the following performance criteria as the Committee may deem appropriate: appreciation in value of the shares, total stockholder return, operating income or earnings and/or growth thereof, net income, pretax earnings, pretax earnings before interest, depreciation and amortization, pro forma net income, return on equity, .... .

Kwon and Yin (2006) find no difference in the association between compensation and accounting return in both high- and low-tech firms. Our study extends this line of research by examining whether there is a difference between the two groups in terms of the association between pro forma earnings and executive compensation.

Using Lexis/Nexis, quarterly and yearly pro forma earnings numbers are collected from earnings announcements. The descriptive statistics of the sample indicate that pro forma earnings are significantly different from the I/B/E/S earnings suggesting that inferences and conclusions reached in prior studies (e.g., Bradshaw and Sloan 2002; Doyle et al. 2003) that use I/B/E/S actual earnings as a proxy for pro forma earnings may not be accurate. The results indicate that pro forma earnings are more informative than GAAP earnings and that pro forma earnings are more value relevant relative to GAAP earnings in both high- and low-tech industries. Our results also indicate that the pro forma earnings are more value relevant in high-tech firms.

The results with respect to executive compensation show that the association of pro forma earnings is significantly stronger than the association with GAAP earnings. However, when dividing the sample into high-tech and low-tech groups, the association between pro forma earnings and executive compensation was only significant in the low-tech industries. GAAP earnings in the meantime were not significant in either group.

### **LITERATURE REVIEW**

The market reaction to either pro forma earnings or GAAP earnings depends, in part, on the way information is processed by market participants. Fama (1970) indicates that under the Efficient Market Hypothesis (EMH), the security prices reflect all available information. Despite the theoretical importance of the EMH, Bloomfield (2002) indicates that the academic community has shown increasing dissatisfaction with it. He presents an alternative to the EMH called the Incomplete Revelation Hypothesis (IRH). One of the implications of the IRH is the managers' financial reporting behavior that includes the decisions to announce pro forma earnings.

Brown et al. (2007) find that managers strategically accelerate the time of earnings announcements that contain pro forma earnings numbers, relative to those that do not have pro forma adjustments. However, they find that the investors are not misled by this practice. On the other hand, experiments conducted by Frederickson and Miller (2004) and Elliot (2006) show that investors' reaction to pro forma earnings differs based on the level of the investors' sophistication. The results of another experiment by Frederickson and Miller (2007) suggest that nonprofessional investors and professional investors are affected differently by the disclosure of pro forma earnings. They indicate that in addition to differences in the way the information is processed between professional and non-professional investors, nonprofessional investors use pro forma earnings in their valuation because of

unintentional cognitive effects rather than considering pro forma earnings to be more informative.

Critics such as Grant and Parker (2001) argue that pro forma numbers are not comparable across firms or even comparable for the same firm over time. According to Bhattacharya et al. (2003), these critics allege that managers selectively exclude items from GAAP earnings to arrive at the pro forma number in order to portray the company in the best light possible (Weil 2001a). In response to these and other concerns, section 401(b) of the Sarbanes-Oxley Act of 2002 authorizes that the SEC is to issue rules on the disclosure of pro forma financial information. These rules require that the pro forma financial information should also be reconciled with the results of operation under GAAP.<sup>2</sup> Elliott (2006) finds that the reconciliation between pro forma and GAAP earnings mitigates the influence of pro forma earnings disclosure on the judgments and decisions of the non-professional investors. He also finds that the presence of reconciliations changes the analysts' judgments and decisions to view pro forma earnings as more reliable. Marques (2006) investigates the effect of corporate governance on the disclosure of non-GAAP earnings measures. She shows that companies with stronger corporate governance did not lower the degree of reporting non-GAAP measures after regulation G, compared to other companies, because they are less likely to make misleading earnings adjustments.

Focusing on the excluded expenses from pro forma earnings, Doyle et al. (2003) investigate whether these expenses provide incremental information about a firm's future cash flows, and whether the stock market appreciates the association between these excluded expenses and future cash flows. They find that

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<sup>2</sup> In January 2003, the SEC introduced its new rule, "Conditions for Use Non-GAAP Financial Measures." The new rule created Regulation G, defining non-GAAP measures and creating standards for their disclosure (Final rule: Conditions for Use of Non-GAAP financial Measures: <http://www.sec.gov/rules/final/33-8176.htm>).

excluded expenses are far from being unimportant or nonrecurring. They find that one dollar of excluded expenses predicts 3.33 fewer dollars of cash flow over the next three years. Landsman et al. (2007) assess the predictive and valuation abilities of the items excluded from pro forma earnings. Their results are similar to Doyle et al. (2003) in terms of market inefficiency in evaluating the exclusions.

While Bradshaw and Sloan (2002), Brown and Sivakumar (2003) and Doyle et al. (2003) use earnings reported by I/B/E/S as a proxy for pro forma,<sup>2</sup> Bhattacharya et al. (2003) use actual pro forma announcements to measure their relative informativeness and permanence. Their analysis indicates that the pro forma earnings are more informative and more permanent than GAAP operating earnings. Lougee and Marquardt (2004) use a sample of 249 quarterly press releases from 1997 to 1999 that include pro forma earnings numbers and a matched sample to address two questions: (1) what characteristics distinguish firms that include pro forma earnings in their announcements, and (2) whether the usefulness of pro forma earnings to investors and its ability to predict future performance vary systematically with these firm characteristics. They address the question of what motivates firms to release pro forma earnings and find that firms that report pro forma earnings have lower earnings-returns correlation, greater sales growth, and greater earnings variability than other firms. They also find that firms with negative earnings surprises are more likely to release pro forma earnings information. In addition, they show that pro forma earnings figures have greater relative and incremental information content and a greater ability to predict future operating performance and returns when GAAP earnings

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<sup>2</sup> Doyle et al. (2003), page 150, indicate erroneously that Bhattacharya et al. (2003) did not find a statistical difference between actual pro forma earnings and earnings reported by I/B/E/S, therefore they used I/B/E/S reported earnings as a proxy for pro forma earnings. In fact, Bhattacharya et al. (2003), page 300, indicate that there is a statistical difference between the two measures, and as a result they conclude that using the I/B/E/S actual earnings numbers as proxy for pro forma earnings may be problematic.

quality is low. The current study extends the research on the value relevance of pro forma earnings by studying the industry membership effect on the value relevance of pro forma earnings.

Several studies examine the difference in value relevance of accounting information between high- and low-tech firms. Collins et al. (1997) find accounting information has slightly lower incremental value relevance in high-tech firms relative to in low-tech firms. Lev and Zarowin (1999) indicate that expenses such as restructuring costs and R&D are immediately expensed while their benefits are recorded later rendering the accounting measurement process of periodically matching costs with revenues seriously distorted. Since these expenses are often excluded from the calculation of pro forma earnings, the difference in value relevance of pro forma earnings across industries (high- vs. low-tech) is expected to be unlike the difference in the GAAP value relevance. Even though Lougee and Marquardt (2004) indicate that announcing pro forma earnings is more likely to come from high-tech firms where GAAP earnings are expected to be less relevant, no prior study has examined whether pro forma earnings are more value relevant in high-tech firms.

The second part of the study examines the association between a performance measure and executive compensation. Agency literature, therefore, provides a theoretical framework for addressing this issue. Murphy (1999) indicates that the history of executive compensation research began in the early 1980s and paralleled the emergence of the agency theory. Early studies in this area focused on documenting the relation between CEO pay and company performance (e.g., Coughlan and Schmidt 1985; Murphy 1985; Jensen and Murphy 1990a). Jensen and Murphy (1990 a and b) find a modest relation between CEO compensation and corporate performance. They demonstrate that current and lagged changes in shareholders' wealth explain very little of the changes in CEO cash compensation or change in total compensation. They find that cash compensation is no more variable than the pay of regular workers, and that accounting returns explain more of the variance in cash compensation than do

changes in shareholder wealth. On the contrary, Hall and Liebman (1998) document a strong relationship between firm performance measured in stock returns and CEO compensation. They ascribe the results of Jensen and Murphy (1990a and 1990b) to the use of the outdated sample.

Kwon and Yin (2006) examine the differences between high- and low-tech firms in compensation policies. They also investigate compensation to market and accounting performance across industries. While they find that the relationship between compensation and stock return is higher for high-tech firms, they did not find difference in the relationship between compensation and earnings in both groups. The current study extends Kwon and Yin (2006) by examining the difference in the value relevance of pro forma earnings between high-tech and low-tech firms.

## **HYPOTHESES DEVELOPMENT AND RESEARCH DESIGN**

Since the GAAP earnings are less informative in high-tech companies because of their large investments in intangibles (Collins et al. 1997; Lev and Zarowin 1999), and since pro forma earnings announcing firms are concentrated in the high-tech industries (Bhattacharya et al. 2003), we expect that pro forma earnings to be more value relevant than GAAP earnings in high-tech firms. To see whether our expectation is true, we examine the following hypothesis:

*H1: Pro forma earnings are more value relevant than GAAP earnings in high-tech industries.*

Lougee and Marquardt (2004), show that the reporting pro forma earnings is more likely for high-tech firms other than for other firms. If managers of high-tech firms announce pro form earnings to provide clearer picture of their firms' performance after excluding the effects of R&D expenditure and the amortization of other intangibles, then the association of pro forma earnings with

the firm market value should be stronger in high- relative to low-tech firms. We thus test the following hypothesis stated in its alternative form.

*H2: Pro forma earnings are more value relevant for firms in high-tech industries relative to firms in low-tech industries.*

Several performance measures, such as earnings, cash flows, EVA, and stock returns, have been used in examining the sensitivity of executive compensation to corporate performance. Healy (1985) documents that most bonus schemes define a variant of reported earnings for use in the computation of the amount allocated to bonus pools. Sloan (1993) show that there is a significant statistical association between top-executive cash compensation and reported earnings. Natarajan (1996) finds that earnings and cash flows from operations have a better association with cash compensation than earnings alone. Despite the increasing attention to pro forma earnings figures (Bradshaw and Sloan 2002), no prior study has addressed the ability of pro forma earnings to explain executive compensation. Thus, to examine the association between pro forma earnings and executive compensation, we postulate the following two hypotheses stated in the alternative form:

*H3: Executive compensation is significantly associated with pro forma earnings.*

*H4: The association of executive compensation with pro forma earnings is stronger than the association of executive compensation with GAAP earnings.*

Kwon and Yin (2006) find no difference in the association of compensation with (GAAP) earnings between high-tech and low-tech firms. Our study extends their research by examining whether there a difference in the association of pro forma earnings with executive compensation between the two groups. Since the

practice of announcing pro forma earnings might be motivated by the managers opportunistic behavior to positively influence the market perception of their firms' performance. And since this practice is more dominant in the high-tech industries, we expect pro forma earnings to be more associated with compensation in the high-tech group. To examine this expectation, we test the following hypothesis:

*H5: The association of executive compensation with pro forma earnings is stronger in the high-tech industries relative to the low-tech industries.*

## RESEARCH DESIGN

To test H1 of whether there is a difference in the value relevance of the pro forma earnings relative to GAAP earnings between high-tech and low-tech industries, we measure the association between pro forma and GAAP earnings and stock price in both industries using the following models:

$$P_{it} = \alpha + \beta_1 E_{it \text{ pro forma}} + \varepsilon_{it} \quad (1)$$

$$P_{it} = \alpha + \beta_1 E_{it \text{ GAAP}} + \varepsilon_{it} \quad (2)$$

We run these two models for the whole sample, for the high-tech sample, and for the low-tech sample.

To test H2 of whether pro forma earnings are more value relevant for investors in the high-tech industries, model (3) is estimated. Model (4) is estimated to complete the line of comparison between pro forma and GAAP earnings.

$$P_{it} = \alpha + \beta_1 E_{it \text{ pro forma}} + \beta_2 HL * E_{it \text{ pro forma}} + \varepsilon_{it} \quad (3)$$

$$P_{it} = \alpha + \beta_1 E_{it \text{ GAAP}} + \beta_2 HL * E_{it \text{ GAAP}} + \varepsilon_{it} \quad (4)$$

where  $P_{it}$  is the firm  $i$ 's stock price three month after fiscal period end,  $E_{it \text{ pro forma}}$  is pro forma earnings collected from earnings announcements,  $E_{it \text{ GAAP}}$  is GAAP earnings collected from Compustat (quarterly item #Q9), and  $HL$  is a dummy variable that equals 1 if the firms is a high-tech firm and zero otherwise. We

use a classification similar to that used by Francis and Schipper (1999) to divide the sample into two groups of high-tech and low-tech firms. After we run these models for both groups, the significance of the earnings coefficients and the  $R^2$ s of the models are compared to determine differences in the value relevance of earnings between the two groups. A positive and significant coefficient on the interaction term,  $\beta_2$ , indicates that the earnings measure is more relevant in the high-tech firms.

To test H3 on the association between executive compensation and pro forma earnings, we use the following model to measure the sensitivity of executive compensation to pro forma earnings:

$$\Delta \text{Comp}_{it} = \alpha + \beta_1 \text{UE}_{it \text{ pro forma}} + \beta_2 \text{Ret}_{it} + v_{it} \quad (5)$$

where the  $\text{Comp}_{it}$ , is cash compensation measured as the sum of cash salary and cash bonus, and  $\text{UE}_{it \text{ pro forma}}$  is the difference between pro forma earnings and mean analyst forecasts estimated three months before the earnings announcement date deflated by the book value per share at the beginning of the fiscal year (Compustat item #60 / item # 25).  $\text{Ret}_{it}$  is the stock returns included in the model because Rosen (1992) notes the need for considering both accounting and security performance indicators when analyzing executive compensation arrangements. Thus, Baber et al. (1998) indicate that meaningful specifications of relations between compensation and firm performance include both accounting earnings and common stock returns as explanatory variables.

To examine H4, which relates to the strength of the association of executive compensation with pro forma earnings relative to its association with GAAP earnings, data on the highest paid five executives is used to estimate the following regression:

$$\Delta \text{Comp}_{it} = \alpha + \beta_1 \text{UE}_{it \text{ GAAP}} + \beta_2 \text{Ret}_{it} + v_{it} \quad (6)$$

where  $UE_{itGAAP}$  is the unexpected GAAP earnings defined as the difference between diluted earnings per share before extraordinary items (Compustat data item #57) and mean analysts forecast estimated three months before earnings announcements deflated by the book value per share at the beginning of the fiscal year (Compustat item #60 / item # 25).

H5 stipulates that the association of executive compensation with pro forma earnings is stronger in high-tech industries relative to low tech-industries. To examine whether there is a difference in the executive compensation association with pro forma (and GAAP) earnings across industries (high-versus low-tech), the following models are estimated.

$$\Delta Comp_{it} = \alpha + \beta_1 UE_{itpro\ form\ a} + \beta_2 Ret_{it} + \beta_3 HL * UE_{itpro\ form\ a} + \beta_4 HL * Ret_{it} + v_{it} \quad (7)$$

$$\Delta Comp_{it} = \alpha + \beta_1 UE_{itGAAP} + \beta_2 Ret_{it} + \beta_3 HL * UE_{itGAAP} + \beta_4 HL * Ret_{it} + v_{it} \quad (8)$$

Where HL is a dummy variable that equals one if the firm is a high-tech firm and zero otherwise. A positive and significant coefficient on the interaction term,  $\beta_3$ , indicates a stronger association in the high-tech firms.

## RESULTS

The sample of pro forma earnings announcements is collected from Lexis Nexis during a five-year period from January 1998 to December 2002. All earnings announcements that have data on the diluted pro forma EPS are examined. The key words used in the search are: “pro forma earnings,” “pro forma net earnings,” “pro forma net income,” “pro forma net loss,” “pro forma EPS,” “pro forma diluted earnings per share,” “pro forma diluted EPS,” and “pro forma income per diluted share.” For consistency, the search excluded announcements of other non-

GAAP nomenclatures such as “cash earnings,” “earnings excluding,” and “income excluding,” among others.

**Table 1**  
**Sample Selection**

Number of Observations	
Press releases that contain information on pro forma earnings during the five-year period starting from January 1998 and ending on December 2002	7,211
Press releases removed for having irrelevant pro forma earnings information	2,017
Number of usable pro forma earnings announcements	5,141
Number of firm-quarter usable announcements	4,072
Number of firm-year usable announcements	1,069
<i>For the firm-quarter announcements:</i>	
Number of observations for which Compustat and CRSP data is available	1,378
<i>For the firm-year announcements:</i>	
Number of observations for which ExecuComp and I/B/E/S data is available	693

As shown in Table 1, the initial search resulted in 7,211 press releases. After analyzing each press release and excluding releases that contain expected future pro forma earnings, preliminary pro forma earnings results, prior year pro forma earnings, duplicate announcements, or announcements that have more than one pro forma earnings measure, only 5,141 useable announcements for 1,283 companies are left. Among those, 4,072 are quarterly earnings announcements and 1,069 are yearly earnings announcements. Compustat and CRSP data was available for 1,378 observations. ExecuComp and I/B/E/S data was available for 693 observations.

Table 2 shows descriptive data on the distribution of the sample firms by industry. In addition, it shows the distribution of a comparative sample of Compustat listed firms during the year 2002. Following Fama and French (1997), the firms are assigned to one out of 48 industry classifications based on their 4-digit SIC code. SIC code data is available for 972 pro forma announcing firms. The findings show that almost one third of the sample falls into the business service industry while only 12.77 % of Compustat firms are listed in this industry. This industry includes prepackaged software and computer related services such as data processing and information retrieval services (Lougee and Marquardt 2004). In the pro forma earnings sample, the second largest concentration is formed out of the electronic equipment companies which constitute 14.30% of the sample. The proportions of these two industries relative to the total number of firms in the pro forma sample are significantly higher than their proportions in the Compustat sample. On the other hand, the banking industry is not represented in the pro forma sample as high as it is in the Compustat listed firms. While this sector constitutes only 1.34% of the pro forma sample, it represents more than 10% of all Compustat firms. Table 2 shows that the difference in proportions across the two groups is statistically significant for several industries with a significant Z-values and P-values of less than 0.001. These industries are: business services, electronic

**Table 2**  
**Distribution of Pro Forma Earnings Announcing Firms by Industry**

Industry	Number of Firms in Pro Forma Sample	% of the Sample	% of Compustat Firms	z-value	p-value
Business Services	320	32.92%	12.77%	18.83	0.0000
Electronic Equipment	139	14.30%	5.36%	12.39	0.0000
Computers	93	9.57%	3.81%	9.37	0.0000
Retail	45	4.63%	3.91%	1.17	0.1219
Pharmaceutical Products	35	3.60%	5.24%	-2.29	0.0110
Machinery	25	2.57%	2.74%	-0.31	0.3769
Measuring and Control Equip	25	2.57%	1.77%	1.91	0.0281
Wholesale	22	2.26%	3.03%	-1.39	0.0820
Petroleum and Natural Gas	20	2.06%	3.25%	-2.10	0.0180
Trading	20	2.06%	4.53%	-3.70	0.0001
Medical Equipment	17	1.75%	2.79%	-1.98	0.0240
Healthcare	14	1.44%	1.25%	0.53	0.2979
Telecommunications	14	1.44%	3.89%	-3.95	0.0000
Restaurants, Hotel, Motel	13	1.34%	1.65%	-0.76	0.2230
Banking	13	1.34%	10.77%	-9.49	0.0000
Insurance	13	1.34%	2.68%	-2.59	0.0048
Construction	12	1.23%	0.89%	1.15	0.1253
Utilities	11	1.13%	3.95%	-4.51	0.0000
Apparel	10	1.03%	1.09%	-0.18	0.4300
Chemicals	10	1.03%	1.59%	-1.40	0.0809
Construction Materials	10	1.03%	1.50%	-1.20	0.1148
Transportation	10	1.03%	2.40%	-2.79	0.0026
Consumer Goods	7	0.72%	1.30%	-1.59	0.0558
Business Supplies	7	0.72%	0.78%	-0.22	0.4115
Food Products	6	0.62%	1.26%	-1.80	0.0357
Entertainment	6	0.62%	1.64%	-2.51	0.0061
Electrical Equipment	6	0.62%	0.74%	-0.44	0.3317
Personal Services	6	0.62%	0.80%	-0.62	0.2662
Agriculture	5	0.51%	0.34%	0.94	0.1736
Alcoholic Beverage	4	0.41%	0.30%	0.61	0.2713
Toys	4	0.41%	0.76%	-1.25	0.1054
Steel Works	4	0.41%	1.16%	-2.17	0.0148
Miscellaneous	4	0.41%	2.84%	-4.56	0.0000
Printing and Publishing	3	0.31%	0.63%	-1.27	0.1020
Rubber and Plastic Products	3	0.31%	0.84%	-1.82	0.0344
Automobiles and Trucks	3	0.31%	1.29%	-2.70	0.0034
Fabricated Products	2	0.21%	0.28%	-0.44	0.3295
Aircraft	2	0.21%	0.33%	-0.66	0.2534
Defense	2	0.21%	0.11%	0.97	0.1669
Shipping Containers	2	0.21%	0.27%	-0.38	0.3518
Real Estate	2	0.21%	0.87%	-2.22	0.0132
Candy and Soda	1	0.10%	0.25%	-0.90	0.1844
Shipbuilding, Railroad Eq.	1	0.10%	0.44%	-1.60	0.0547
Precious Metals	1	0.10%	0.82%	-2.48	0.0066
<b>TOTAL</b>	<b>972</b>	<b>100.00%</b>	<b>100.00%</b>		

Industries are defined following the classification of Fama and French (1997). Z-statistic is calculated as follows:  $Z = \left( \hat{p} - P \right) / \sqrt{(P - Q) / n}$  (Black, 1994). Where  $\hat{p}$  is the pro forma sample proportion,  $p$  is the Compustat sample proportion,  $Q = 1 - p$ , and  $n$  is the number of pro forma sample companies in the industry.

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equipment, computers, trading, telecommunication, banking, and utilities.

To further explore the characteristics of the pro forma sample, a two tailed t-test assuming unequal variance is conducted to compare the characteristics of the firms in the pro forma sample to characteristics of the firms listed in Compustat active and research files that have data on the variables of interest. The results of Table 3 show that pro forma earnings announcing firms, on average, are not significantly different from the firms listed on Compustat in terms of their sales revenues, number of employees, and debt to equity ratio. On the other hand, the results show significant differences between the two groups on several other dimensions. Pro forma earnings announcing firms are, on average, significantly less profitable. Compared to about \$29 million of net income achieved by an average Compustat firm, the average net loss of the pro forma sample is more than \$63 million during the sample period. In addition, pro forma announcing firms are higher in risk as measured in terms of beta and are higher in intangible intensity. Pro forma earnings announcing companies can be classified as mostly growth firms as evidenced by their significantly higher market to book ratio. In addition, pro forma firms are significantly smaller on average than the average company listed in Compustat as measured in terms of total assets, book value, and market value.

### Table 3

**Descriptive Statistics and Univariate Tests of Differences in the Firms' Characteristics between the Pro Forma Earnings Announcing Firms Sample and Compustat Population**

Variable	Pro Forma Sample	Compustat Active and Research	t-value	p-value
Net income				
Mean	-63.51	28.96	3.78	0.000
Standard Deviation	709.94	222.16		
Book value per share				
Mean	6.07	13.84	6.20	0.000
Standard Deviation	6.51	108.18		
Total assets				
Mean	1,696.26	2,421.88	2.93	0.002
Standard Deviation	6,466.49	8,150.14		
Market value				
Mean	1,380	1,834	2.02	0.043
Standard Deviation	5,543	9,924		
Sales				
Mean	1,149.86	1,190.98	0.25	0.801
Standard Deviation	4,327.68	3,558.12		
Employees				
Mean	4.88	5.07	0.34	0.735
Standard Deviation	14.21	13.77		
Intangible intensity				
Mean	0.16	0.11	-7.27	0.000
Standard Deviation	0.17	0.17		
Market-to-book				
Mean	2.01	1.65	-2.83	0.004
Standard Deviation	6.16	3.95		
Debt-to-equity				
Mean	1.26	13.34	1.12	0.264
Standard Deviation	8.29	968.05		
Beta				
Mean	1.78	1.00	-16.27	0.000
Standard Deviation	1.27	1.22		

Where net income is the firm net income or loss in millions of dollars (Compustat item #A172), book value per share is the firm common equity (Compustat item #A60) divided by the number of outstanding shares (Compustat item #A25), total assets in millions of dollars (Compustat item #A6), market value in millions of dollars is stock price (Compustat item #A199) multiplied times the number of outstanding shares (Compustat item #A25), sales

is the annual net sales in millions of dollars (Compustat item #A12), employees is the number of employees in the company in thousand of employees (Compustat item #A29), intangible intensity is the company's intangible assets (Compustat item #133) divided by total assets (Compustat item #A6), market-to-book value is the price to book ratio at fiscal year end (Compustat item MKBKF), debt-to-equity is the total liability (Compustat item #A181) divided by total equity (Compustat item #A60), and beta is a Compustat item that measures the sensitivity of the firm's stock price to fluctuation in the S&P 500 Index Price for U.S. companies. P-values are estimated for two tailed t-test assuming unequal variance. Values are calculated after removing observations in the extreme upper and lower 1% of the distribution.

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Table 4 provides descriptive statistics on both quarterly and yearly data for pro forma earnings, GAAP earnings, and actual earnings reported by I/B/E/S. Panel A shows that the quarterly pro forma earnings, with an average of \$0.032, is the only significantly positive earnings measure among the three measures (t-value = 5.02). The mean of the GAAP earnings, which is -\$0.318, and the mean of the I/B/E/S actual earnings, which is -\$0.031, are significantly negative (t-values = -12.48 and -3.06, respectively). The mean annual pro forma earnings, which is \$0.18, is also the largest relative to both GAAP earnings of -\$0.899 and I/B/E/S actual earnings of 0.106. These results are consistent with the results of previous studies such as Bhattacharya et al. (2003).

Using one sample t-test for the differences between the measures, Table 4 Panel B shows that the average difference between quarterly pro forma earnings and quarterly GAAP earnings and quarterly pro forma earnings and quarterly I/B/E/S actual earnings are \$0.346, and \$0.067, respectively. These differences are significantly different from zero (t-values = 14.97 and 8.10, respectively). The results also show that the difference between yearly pro forma earnings and yearly GAAP earnings and yearly I/B/E/S earnings is \$1.10 and \$0.084, respectively. These differences are positive and significantly different from zero (t-values = 13.03 and 3.15, respectively). This means that the pro forma earnings are significantly higher than the other two earnings measures, GAAP earnings and I/B/E/S actual earnings. These results indicate that using I/B/E/S earnings as a proxy for pro

forma earnings will not lead to accurate conclusions; this is consistent with the fact that I/B/E/S reports actual earnings after adjusting them for comparability.<sup>3</sup> The results also indicate that GAAP earnings are more conservative relative to both pro forma and I/B/E/S earnings measures.

Table 4 Panel C shows that in 78% of the time, quarterly pro forma earnings numbers are higher than the GAAP earnings numbers, and in 79% of the time, yearly pro forma earnings numbers are higher than the GAAP earnings numbers. Panel C also shows that quarterly pro forma earnings numbers are equal to the quarterly I/B/E/S actual earnings numbers in 76% of the time and that the yearly pro forma numbers are equal to the I/B/E/S actual earnings numbers in 36% of the time.<sup>4</sup> Finally, Panel D shows that while quarterly pro forma earnings numbers beat the forecast in 51% of the time, GAAP quarterly earnings numbers only beat the forecast numbers in 20% of the time. For the annual data, the pro forma earnings beat the analysts' forecasts in 55% of the time, while GAAP earnings beat the forecasts in only 17% of the time.

#### Table 4

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<sup>3</sup> I/B/E/S reports actual earnings as soon as they are released into the market place. Earnings reports are culled directly from the newswires, adjusted for comparability with estimates. With very few exceptions analysts make their earnings forecasts on a continuing operations basis. This means that I/B/E/S receives an analyst's forecast after discontinued operations, extra-ordinary items, and other non-operating items have been backed out. Also I/B/E/S adjusts reported earnings to match analysts' forecasts on both an annual and quarterly basis (Source: *The I/B/E/S Glossary 2000. A Guide to Understanding I/B/E/S Terms and Conventions.* I/B/E/S International Inc.)

<sup>4</sup> Bhattacharya et al. (2003) find similar results. In their paper, while pro forma earnings are equal to I/B/E/S actual reported earnings in 65% of the cases, the mean pro forma earnings are significantly higher. These findings give support to the use of actual pro forma numbers rather than I/B/E/S' numbers as a proxy for pro forma earnings.

**Descriptive Statistics Based on 1,754 Quarterly and 589 Yearly Pro Forma Earnings Announcements**

**Panel A: Descriptive Statistics for Key Variables**

<b>Quarterly</b>								
Variable	n	Mean	Media	Std.	Max.	Min.	Sig. Different from Zero	
			n	Dev.			t	Sig.
Pro forma earnings	1,754	0.032	0.040	0.266	2.270	-1.670	5.02	0.000
GAAP earnings	1,754	-0.318	-0.080	1.068	0.920	-10.550	-12.48	0.000
I/B/E/S actual earnings	1,754	-0.031	0.030	0.419	1.080	-4.680	-3.06	0.000

  

<b>Yearly</b>								
Variable	n	Mean	Median	Std.	Max	Min	Sig. Different from Zero	
				Dev.			t	Sig.
Pro forma earnings	589	0.180	0.250	0.880	3.310	-3.390	4.98	0.000
GAAP earnings	589	-0.899	-0.140	2.610	1.980	-19.570	-8.37	0.000
I/B/E/S actual earnings	589	0.106	0.240	0.923	1.830	-5.640	2.79	0.006

### **Panel B: Univariate Analyses for the Differences between the Three Earnings Metrics**

#### **Quarterly**

T-test for the Differences Between Quarterly Pro Forma Earnings, GAAP Earnings, and I/B/E/S Actual Reported Earnings.

Pair	Difference	t	df	Sig.
Pro forma - GAAP	0.346	14.97	1830	0.000
Pro forma - I/B/E/S	0.067	8.10	1917	0.000
I/B/E/S - GAAP	0.288	13.33	1753	0.000

#### **Yearly**

T-test for the Differences Between Yearly Pro Forma Earnings, GAAP earnings, and I/B/E/S Actual Reported Earnings.

Pair	Difference	t	df	Sig.
Pro forma - GAAP	1.10	13.03	796	0.000
Pro forma - I/B/E/S	0.084	3.15	723	0.002
I/B/E/S - GAAP	1.004	11.06	591	0.000

### **Panel C: A Comparison of the Three Earnings Metrics**

#### **Quarterly**

<u>Pro Forma Versus GAAP</u>	<u>Pro Forma Versus I/B/E/S</u>	<u>GAAP Versus I/B/E/S</u>
Pro forma > GAAP 78%	Pro forma > I/B/E/S 18%	GAAP > I/B/E/S 10%
Pro forma = GAAP 12%	Pro forma = I/B/E/S 76%	GAAP = I/B/E/S 17%
Pro forma < GAAP 10%	Pro forma < I/B/E/S 6%	GAAP < I/B/E/S 73%

#### **Yearly**

<u>Pro Forma Versus GAAP</u>	<u>Pro Forma Versus I/B/E/S</u>	<u>GAAP Versus I/B/E/S</u>
Pro forma > GAAP 79%	Pro forma > I/B/E/S 36%	GAAP > I/B/E/S 13%
Pro forma = GAAP 7%	Pro forma = I/B/E/S 36%	GAAP = I/B/E/S 5%
Pro forma < GAAP 14%	Pro forma < I/B/E/S 28%	GAAP < I/B/E/S 82%

**Panel D: A Comparison of the Three Earnings Metrics**  
**Earnings Metric Versus Analyst Forecasts**

<b>Quarterly</b>		<b>Yearly</b>	
Pro forma > Forecasts	51%	Pro forma > Forecasts	55%
Pro forma = Forecasts	10%	Pro forma = Forecasts	8%
Pro forma < Forecasts	39%	Pro forma < Forecasts	37%
GAAP > Forecasts	20%	GAAP > Forecasts	17%
GAAP = Forecasts	3%	GAAP = Forecasts	2%
GAAP < Forecasts	77%	GAAP < Forecasts	81%
Actual I/B/E/S > Forecasts	46%	Actual I/B/E/S > Forecasts	51%
Actual I/B/E/S = Forecasts	12%	Actual I/B/E/S = Forecasts	9%
Actual I/B/E/S < Forecasts	42%	Actual I/B/E/S < Forecasts	40%

Where pro forma is pro forma earnings numbers collected from earnings announcements in Lexis/Nexis, GAAP is quarterly and yearly diluted earnings per share excluding extraordinary items (Compustat item # Q9 and item #A57), and, I/B/E/S is actual earnings reported in I/B/E/S,<sup>5</sup> and I/B/E/S forecasted earnings are earnings forecast mean estimates for the same period estimated three months before the pro forma announcement date.

An objective of the study is to examine whether there are differences between high- and low-tech firms in terms of the value relevance of pro forma earnings. The sample was divided into high- and low-tech groups.<sup>6</sup> When comparing the two groups we

<sup>5</sup> I/B/E/S glossary 2001 states that: "I/B/E/S strives to report actual earnings as soon as they are released into the market place. For the U.S. and Canada, earnings reports are culled directly from the newswires, adjusted for comparability with estimates and reported to subscribers via the Intra Day Surprise Report, which is delivered five times each trading day." The adjustment of earnings explains the statistically significant difference between pro forma earnings and I/B/E/S actual earnings and gives support for the approach followed in this study of collecting actual data from actual pro forma earnings announcements over using actual I/B/E/S earnings as a proxy for pro forma earnings.

<sup>6</sup> Firms that are members in the following industries were classified as high-tech firms: Drugs, Computer and office Equipment, communication Equipment, Electric Components and Semiconductors, Telephone Communications, Computer Programming, Software, Data Processing, Research, Development, and Testing Services. On the other hand, firms that are members of the following industries were classified as low-tech firms: Mining, Special Industry

find statistically significant differences along several items. The high-tech firms spend on average \$11.61 millions quarterly on R&D, compared to \$5.94 millions quarterly for the low-tech firms. The difference is significant (t-value 5.23; p-value <0.0001). This significant difference indicates that our classification of the sample captures the difference between high- and low-tech firms along this dimension. In addition, the high-tech firms, in our sample, are less profitable than low-tech companies regardless of the profitability measure. The high-tech firms generate on average \$ -0.46 and \$ -0.03 of quarterly GAAP and pro forma earnings, respectively. The low-tech firms, on the other hand, generate on average \$-0.02 and \$ 0.15 of GAAP and pro forma earnings, respectively. The difference between the two groups is significant for both earnings measures (t-value -8.32, -5.65; p-value <0.0001 and <0.0001, respectively).

Using models (1) and (2), the association of the earnings measure (pro forma or GAAP) with the stock price is estimated. As the results in Table 5 Panel A show, pro forma earnings are generally more relevant relative to the GAAP earnings. In Table 5 Panel B and C, the results support H1. When the sample is divided into high-tech and low-tech firms, the GAAP earnings coefficient is not significant in the high-tech sub-sample (Panel B) while the coefficient on pro forma earnings is significant at 1% level (coeff. = 0.91 and 29.66; t-statistic = 1.31 and 10.12, respectively). On

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Machinery, Lab and Testing Instruments, Surgical, Medical, and Dental Instruments, Stationary and Office Supplies, Eating and Drinking Places, Mortgage and Loan Bankers, Miscellaneous Investing, Video Tape Rental, Engineering Services, Management and Public Relation Services, Beverage, Concrete and Lime, General Industrial Machinery and Equipment, Games and Toys, Electrical Goods and Appliance Wholesale, Miscellaneous Shopping stores, Nursing and Intermediate Care Services, Newspaper, Publishing, and Print, Grocery Stores, Auto Dealer and Gas Stations, Security Brokers, Credit Reporting and Collection Services, Oil and Gas, Industrial Gases and Chemicals, Industrial Organic Chemicals, Plastics and Plastics Product, Metal Forgings and Stampings, Construction and Mining, machinery and Equipment, Furniture, Drug Stores, Insurance Agents, Personal Services, Accounting Services, and Food.

the other hand in the low-tech industries (Panel C), even though pro forma earnings is more relevant than the GAAP earnings as evident by the higher  $R^2$  and the Vuong test, the GAAP earnings still have value relevance in the low-tech industries (coeff. 3.09; t-statistic = 2.56). Taken together the results in Panels B and C indicate that pro forma earnings are more value relevant relative to GAAP specifically in high-tech industries, which support H1.

H2 is about the difference in value relevance of pro forma earnings between high- and low-tech firms. To provide evidence on this difference we estimate models (3) and (4). As shown in Panel D of Table 5, the interaction term in model (3) is significantly positive (coeff. = 21.21; t-statistic = 4.93), which indicates that pro forma earnings are more value relevant in the high tech industries. This result supports H2. On the other hand, the coefficient on the interaction term in model (4) is negative and not significant (coeff. = -2.40; t-statistic = -1.32), which indicates that there is no significant difference in the value relevance of GAAP earnings between high- and low-tech industries.

**Table 5**  
**Comparison of the Value Relevance of Pro Forma Earnings for High- and Low-Tech firms**

Variable	Panel A Total Sample		Panel B High-Tech Firms	
	(1)	(2)	(1)	(2)
Intercept	19.27*** (34.32)	20.43*** (34.25)	21.52*** (29.57)	21.57*** (26.67)
$E_{it \text{ pro forma}}$	21.33*** (10.11)		29.66*** (10.12)	
$E_{it \text{ GAAP}}$		0.82 (1.41)		0.91 (1.31)
$HL * E_{it \text{ proforma}}$				
$HL * E_{it \text{ GAAP}}$				
N	1378	1378	961	961
Adj R2	6.85%	0.07%	9.55%	0.08%
F-value	102.21	1.98	102.34	0.73
p-value	<0.0001	0.16	<0.0001	0.19
Vuong's Z-Statistic		7.08***		7.10***

**Table 5 - Continued**

Variable	Panel C Low-Tech Firms		Panel D Total Sample	
	(1)	(2)	(3)	(4)
Intercept	15.68*** (19.22)	17.84*** (24.22)	19.86*** (34.85)	20.33*** (33.81)
$E_{it \text{ pro forma}}$	14.93*** (5.66)		8.40** (2.51)	
$E_{it \text{ GAAP}}$		3.09** (2.56)		2.93* (1.71)
$HL * E_{it \text{ pro forma}}$			21.21*** (4.93)	
$HL * E_{it \text{ GAAP}}$				-2.40 (-1.32)
N	416	416	1377	1377
Adj R2	6.95%	1.32%	8.40%	0.12%
F-value	32.01	6.55	64.07	1.85
p-value	<0.0001	0.01	<0.0001	0.16
Vuong's Z-Statistic		3.55***		7.88***

Where  $P_{it}$  is the stock price three month after the fiscal period end,  $P_{it-1}$  is the stock price at the end of the previous fiscal period,  $E_{it \text{ pro forma}}$  is pro forma earnings,  $E_{it \text{ GAAP}}$  is the diluted earnings per share before excluding extraordinary items (Compustat item #Q9), and HL is a dummy variable that equals 1 if the firms is high-tech firm and equals zero otherwise.

To examine H3 on whether executive compensation is significantly associated with pro forma earnings, we use a sample of firms with yearly pro forma earnings announcements that have data on ExecuComp database. Compensation data is collected on the highest five paid executives in each of these firms. Table 6 shows the descriptive statistics for the sample over the period 1996 to 2002. Among other things, it shows that the mean pro forma earnings, \$0.83, is clearly higher than the mean GAAP earnings in

**Table 6**  
**Descriptive Statistics for Variables Used in Estimating the Association between Pro Forma Earnings and Executive Compensation**

Total Sample						
Variables	n	Mean	Mdian	St. Div.	Min	Max
E <sub>Pro forma</sub>	693	0.83	0.82	0.73	-2.46	3.31
E <sub>GAAP</sub>	693	0.46	0.64	1.37	-7.37	3.04
Stock return	693	0.22	0.06	0.87	-0.89	4.96
Salary	693	357	312	183	65	1,306
Bonus	693	364	140	371	0	2,594
Option grants	693	3,969	626	8,183	0	106,497
Total comp.	693	3,777	1,309	8,576	101	107,823
High-Tech Firms						
Variables	n	Mean	Mdian	St. Div.	Min	Max
E <sub>Pro forma</sub>	306	0.58	0.58	0.63	-2.46	1.88
E <sub>GAAP</sub>	306	0.16	0.25	1.24	-5.94	3.04
Stock return	306	0.28	-0.02	1.09	-0.88	4.96
Salary	306	340	312	164	65	1,306
Bonus	306	254	149	338	0	2,200
Option grants	306	5,167	1,622	10,559	0	106,497
Total comp.	306	5,832	2,168	10,699	101	107,822
Low-Tech Firms						
Variables	n	Mean	Mdian	St. Div.	Min	Max
E <sub>Pro forma</sub>	387	1.03	1.09	0.75	-1.68	3.31
E <sub>GAAP</sub>	387	0.71	0.93	1.41	-7.37	2.99
Stock return	387	0.18	0.08	0.64	-0.58	3.57
Salary	387	371	314	197	93	1,305
Bonus	387	272	135	397	0	2,594
Option grants	387	1,236	338	5,023	0	91,703
Total comp.	387	2,151	1,019	5,952	117	106,841

Where E<sub>pro forma</sub> is pro forma earnings collected from pro forma earnings announcements, E<sub>GAAP</sub> is the diluted EPS excluding extraordinary items (Compustat item #57), stock return is the yearly stock return, salary is the dollar value of the base salary earned by the named executive officer during the fiscal

year (units: thousands of dollars), bonus is the dollar value of a bonus earned by the named executive officer during the fiscal year (units: thousands of dollars), option grants is the aggregate value of stock options granted to the executive during the year as valued using S&P's Black Scholes methodology (units: thousands of dollars), cash compensation is the total of salary and cash bonus, and total compensation is comprised of the following: salary, bonus, other annual, total value of restricted stock granted, total value of stock options granted (using Black-Scholes) (units: thousands of dollars).

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the sample, \$0.46, and that the average total compensation is slightly higher than \$3.7 million. When dividing the sample into high-tech and low-tech firms, the results show that, in our sample, while low-tech firms have higher GAAP and pro forma earnings on average, the high-tech firms provide higher stock returns. In addition, while the salary and the cash bonus are higher in the low-tech firms, the stock option grants and the total compensation are higher in the high-tech firms.

The purpose of H3 is to examine whether executive compensation is associated with pro forma earnings. Equation (5) is estimated to measure this association. The results in Panel A of Table 7 show that the coefficient on the unexpected pro forma earnings is significant at a 0.01 level (coeff. = 162.26; t-statistic = 3.46), and the F-value of the model is also significant with a p-value of less than 0.0001. These results support H3 which suggests that executive compensation is significantly associated with pro forma earnings. The question now is whether the executive compensation is more associated with pro forma earnings than with GAAP earnings. The results of running equation (6) show that the association between executive compensation and GAAP earnings is not as strong as the association between executive compensation and pro forma earnings. The coefficient on the unexpected GAAP earnings is insignificant (coeff. = 6.98; t-statistic = 0.38). In addition, the adjusted  $R^2$  of model (5), which is 3.20%, is higher than that of model (6), which is 1.54%. Vuong's Z-statistics of the differences in the explanatory powers between the two models, 2.44, is significant. Next, a model that combines both pro forma earnings

and GAAP earnings is estimated. As shown in Table 7, only the coefficient on the unexpected pro forma earnings is significant at a 0.01 level (coeff. = 164.18; t-statistic = 3.45) while the coefficient on the unexpected GAAP earnings is not significant (coeff. = -4.24; t-statistic = -0.23). This means that pro forma earnings have incremental explanatory power over and beyond that of the GAAP earnings in terms of explaining the changes in executive compensation. These results provide support for H4 which postulates that the association of executive compensation with pro forma earnings is stronger than its association with GAAP earnings.

When dividing the sample into two groups, high-tech firms and low-tech firms, the results in Panels B to D of Table 7 show that neither in high-tech nor low-tech industries GAAP earnings are significant in explaining changes in executive compensation. On the other hand, pro forma earnings are significantly associated with executive compensation in the low tech firms. As shown in Panel C, which shows the analysis for low-tech firms, the coefficient on the unexpected pro forma earnings is significant. Also, in Panel D, the coefficient on the interaction term,  $\beta_3$ , is negative and marginally significant at a 0.10 level (coeff. = -158.37; t-statistic = -1.68). This indicates that pro forma earnings explain changes in the executive compensation only in the low-tech industries. These findings do not support Hypothesis 5.

**Table 7**  
**Measuring the Association between Executive Compensation**  
**and both Pro Forma Earnings and GAAP**  
**Earnings**

Variables	Panel A			Panel B		
	Total Sample			High-Tech Firms		
	(5)	(6)	Combined	(5)	(6)	Combined
Intercept	13.87*** (4.94)	14.19*** (4.61)	13.59*** (4.44)	18.95*** (3.40)	20.37*** (3.26)	19.74*** (3.15)
UE <sub>it pro forma</sub>	162.26*** (3.46)		164.18*** (3.45)	99.67 (1.19)		95.13 (1.11)
UE <sub>it GAAP</sub>		6.98 (0.38)	-4.24 (-0.23)		15.06 (0.50)	8.49 (0.28)
Ret <sub>it</sub>	0.078** (2.36)	0.11*** (3.38)	0.079** (2.36)	0.05 (0.99)	0.07 (1.43)	0.05 (0.93)
HL * UE <sub>it pro forma</sub>						
HL * UE <sub>it GAAP</sub>						
HL * Ret <sub>it</sub>						
N	692	692	692	309	309	309
Adj. R <sup>2</sup>	3.20%	1.54%	3.07%	0.65%	0.27%	0.35%
F-value	12.43	6.40	8.29	2.00	1.42	1.36
p-value	<0.0001	<0.01	<0.0001	0.14	0.24	0.26
Vuong's Z- statistic	2.44**			0.77		

Variables	Panel C Low-Tech Firms			Panel D Total Sample	
	(5)	(6)	Combined	(7)	(8)
Intercept	9.13*** (3.92)	9.20*** (3.54)	8.46*** (3.40)	13.59*** (4.86)	13.96*** (4.51)
UE <sub>it pro forma</sub>	257.89*** (5.94)		263.60*** (5.97)	258.83*** (3.67)	
UE <sub>it GAAP</sub>		5.31 (0.26)	-14.89 (-0.75)		18.26 (0.59)
Ret <sub>it</sub>	0.16*** (4.41)	0.18*** (4.78)	0.16*** (4.47)	0.14** (2.44)	0.16*** (2.73)
HL * UE <sub>it pro forma</sub>				-158.37* (-1.68)	
HL * UE <sub>it GAAP</sub>					-17.07 (-0.47)
HL * Ret <sub>it</sub>				-0.08 (-1.10)	-0.07 (-1.04)
N	383	383	383	692	692
Adj. R <sup>2</sup>	13.55%	5.55%	13.45%	3.46%	1.46%
F-value	30.92	12.22	20.78	7.53	3.55
p-value	<0.0001	<0.0001	<0.0001	<0.0001	0.007
Vuong's Z-Statistic	4.21***				

Where comp is cash compensation that equals the total of salary and bonus, UE<sub>it pro forma</sub> is the pro forma earnings less the I/B/E/S mean estimate for the same year estimated three months before the earnings announcement date divided by the book value per share at the beginning of the year (Compustat item #60 / item # 25), UE<sub>it GAAP</sub> is GAAP earnings less the I/B/E/S mean estimate for the same year estimated three months before the earnings announcement date divided by the book value per share at the beginning of the year (Compustat item #60 / item # 25), Ret is the yearly stock return used as a control variable, and HL is a dummy variable that equals 1 if the firms is high-tech firm and equals zero otherwise.

## **CONCLUSIONS, LIMITATIONS, AND FUTURE RESEARCH**

Our study extends prior research on the informativeness of pro forma earnings and their association with executive compensation. We compare the value relevance of pro forma earnings in both high-tech and low-tech industries and measure the association of pro forma earnings with executive compensation. The descriptive statistics indicate that more than half of the pro forma sample consists of firms in business services, electronic equipment, and computer industries. Consistent with prior research, the results show that pro forma earnings are more value relevant than GAAP earnings, especially in the high-tech industries. The results also show that pro forma earnings are more relevant in high-tech firms relative to low-tech firms.

The second part of the study tests the sensitivity of executive compensation to pro forma earnings. The results indicate that compensation is more associated with pro forma earnings than with GAAP earnings. When dividing the sample into high-tech and low-tech groups, only in the low-tech industries that the pro forma earnings are significantly associated with executive compensation, while GAAP earnings are not significantly associated with executive compensation in either the high or low-tech groups.

Future research should focus on the individual items excluded from the calculation of pro forma earnings such as restructuring charges, write-downs and impairments, research and development expenditures, merger and acquisitions costs, mandatory stock compensation expenses, and goodwill amortization, among other, and should explore whether the market participants react differently to each of these items. Pro forma earnings have been a popular measure for more than a decade; a venue of a future research is the examination of the change in the value relevance of pro forma earnings over time.

## REFERENCES

- Amir, E. and B. Lev (1996), 'Value-Relevance of Nonfinancial Information: The Wireless Communications Industry', *Journal of Accounting and Economics*, Vol.22, No.1&3 (August/December), pp. 3-30.
- Baber, W., S. Kang and K. Kumar (1998), 'Accounting Changes and Executive Compensation: The Role of Earnings Persistence', Working Paper (The Washington University).
- Bhattacharya, N., E. L. Black, T. E. Christensen and C. R. Larson (2003), 'Assessing the Relative Informativeness and Performance of Pro Forma Earnings and GAAP Operating Earnings', *Journal of Accounting and Economics* Vol.36, Nos.1&3 (December), pp. 285-319.
- , E. Black, T. Christensen and R. Mergenthaler (2003), 'Empirical Evidence on Recent Trends in Pro Forma Reporting', *Accounting Horizons*, Vol.18, No.1 (March), pp. 27-43.
- Black, K. (1994) *Business Statistics: Contemporary Decision Making* (St. Paul, MN: West Publishing Company).
- Bloomfield, R. J. (2002), 'The "Incomplete Revelation Hypothesis" and Financial Reporting', *Accounting Horizons*, Vol.16, No.3 (September), pp. 233-243.
- Bradshaw, M. T. and R. G. Sloan (2002), 'GAAP versus the Street: An Empirical Assessment of Two Alternative Definitions of Earnings', *Journal of Accounting Research*, Vol.40, No.1 (March), pp. 41-66.
- Brown, L. D. and K. Sivakumar (2003), 'Comparing the Quality of Two Earnings Measures', *Review of Accounting Studies*, Vol.8, No.4 (December), pp. 561-572.
- , E. L. Maydew and I. S. Weiss (1997), 'Changes in the Value-Relevance of Earnings and Book Value over the Past Forty Years', *Journal of Accounting and Economics*, Vol.24, No.1 (December), pp. 39-68.
- Coughlan, A. and R. Schmidt (1985), 'Executive Compensation, Management Turnover, and Firm Performance: An

- Empirical Investigation', *Journal of Accounting and Economics*, Vol.7 Nos.1, 2&3 (April), pp. 43-66.
- Dechow, P. M. (1994), 'Accounting Earnings and Cash Flows as Measures of Firm Performance: the Role of Accounting Accruals', *Journal of Accounting and Economics*, Vol.18, No.1 (July), pp. 3-42.
- Doyle, J. T., R. J. Lundholm and M. T. Soliman (2003), 'The Predictive Value of Expenses Excluded From Pro Forma Earnings', *Review of Accounting Studies*, Vol.8, No.2&3 (June/September), pp. 145-174.
- Elliot, W. B. (2006), 'Are Investors Influenced by Pro Forma Emphasis and Reconciliations in Earnings Announcements?', *The Accounting Review*, Vol.81, No.1 (January), pp. 113-133.
- Fama, E. F. (1970), 'Efficient Capital Markets: A Review of Theory and Empirical Work', *Journal of Finance*, Vol.25, No.2 (May), pp. 383-417.
- and K. R. French (1997), 'Industry Cost of Equity', *Journal of Financial Economics*, Vol. 43, No.2 (February), pp. 153-193.
- Financial Accounting Standard Board (2001), 'Reporting Information about the Financial Performance of Business Enterprises', <http://www.fasb.org/proposals/performance.pdf>.
- Francis, J. and K. Schipper (1999), 'Have Financial Statements Lost their Relevance?', *Journal of Accounting Research*, Vol.37, No.2 (Autumn), pp. 319-352.
- Frederickson, J. R., and J. S. Miller. (2004), 'The Effect of Pro Forma Earnings Disclosure on Analysts' and Nonprofessional Investors' Equity Valuation Judgments', *The Accounting Review* 7 (3): 667-686.
- , and ----- (2007), 'Pro Forma Earnings Disclosures: Do Analysts and Nonprofessional Investors See It Differently?', Working paper, Hong Kong University of Science and Technology.

- Grant, J. and L. Parker (2001), 'EBITDA', *Research in Accounting Regulation*, Vol.15, pp. 205-211.
- Hall, B. and J. Leibman (1998), 'Are CEOs Really Paid Like Bureaucrats?', *Quarterly Journal of Economics*, Vol.113, No. 3 (August), pp. 653-691.
- Healy, P. M. (1985), 'The Effect of Bonus Schemes on Accounting Decisions', *Journal of Accounting and Economics*, Vol. 7, Nos.1&3 (April), pp. 85-107.
- Holmstrom, B. (1979), 'Moral Hazard and Observability', *The Bell Journal of Economics*, Vol.10, No.1 (Spring), pp. 74-91.
- Jensen, M. and K. J. Murphy (1990a), 'CEO Incentives: It's Not How Much, but How', *Harvard Business Review*, Vol.68, No.3 (May/June), pp. 138-153.
- (1990b), 'Performance Pay and Top Management Incentives', *Journal of Political Economy*, Vol.98, No.2 (April), pp. 225-264.
- Kennedy, P. (1998), *A Guide to Econometrics* (Cambridge, MA: The MIT press).
- Kothari, S. P. (2001), 'Capital Market Research in Accounting', *Journal of Accounting and Economics*, Vol.31, Nos.1&3 (September), pp. 105-232.
- Kwon, Sung. S. and Q. J. Yin (2006), 'Executive Compensation, Investment Opportunities, and Earnings Management: High-Tech Firms Versus Low-Tech Firms', *Journal of Accounting, Auditing, and Finance*, Vol.21, No.2 (Spring), pp. 119-148.
- Landsman, W. R., B. L. Miller, and S. Yeh (2007), 'Implications of Components of Income Excluded from Pro Forma Earnings for Future Profitability and Equity Valuation', *Journal of Business Finance and Accounting* 34 (3&4): 650-675.
- Lev, B. and P. Zarowin (1999), 'The Boundaries of Financial Reporting and How to Extend Them', *Journal of Accounting Research*, Vol. 37, No.2 (Autumn), pp. 353-385.

- Lougee, B. A. and C. A. Marquardt (2004), 'Earnings Informativeness and Strategic Disclosure: An Empirical Examination of 'Pro Forma' Earnings', *The Accounting Review*, Vol. 79, No.3 (July), pp. 769-795.
- Maddala, G. S. (2001), *Introduction to Econometrics* (Chichester, NY: John Wiley & Sons, LTD).
- Marques, A. (2006), "The Impact of Corporate Governance on the Disclosure of Manager-Adjusted Non-GAAP Earnings", Working paper, Universidade Nova de Lisboa.
- Murphy, K. J. (1985), 'Corporate Performance and Managerial Remuneration: An Empirical Analysis', *Journal of Accounting and Economics*, Vol.7, Nos.1&3 (April), pp. 11-42.
- (1999), *Executive Compensation. Hand Book of Labor Economics* (Amsterdam: North-Holland).
- Natarajan, R. (1996), 'Stewardship Value of Earnings Components: Additional Evidence on the Determinants of Executive Compensation', *The Accounting Review*, Vol.71, No.1 (January), pp. 1-22.
- Pavlik, E. L., T. W. Scott and P. Tisessen (1993), 'Executive Compensation: Issues and Research', *Journal of Accounting Literature*, Vol.12, pp. 131-189.
- Rosen, S. (1992), 'Contract and Market for Executives', In *Contract Economics*, Edited by Lars Wein and Hans Weekenders, (Cambridge, MA: Blackwell Publishers).
- Securities and Exchange Commission (2003), 'Conditions for Use of Non-GAAP Financial Measures. Release No. 33-8176; 34-47226; FR-65; FILE NO. S7-43-02 RIN 3235-A169 Effective Date: March 28, 2003', <http://www.sec.gov/rules/final/33-8176.htm>.
- Sloan, R. R. (1993), 'Accounting Earnings and Top Executive Compensation', *Journal of Accounting and Economics*, Vol.16, Nos.1, 2, &3 (January/April/July), pp. 55-100.
- U.S. Congress (2002), 'The *Sarbanes-Oxley Act of 2002*', 107th Congress of the United States of America, H.R. 3763, (Washington, D.C.: Government Printing Office).

- Vuong, Q. (1989), 'Likelihood Ratio Tests for Model Selection and Non-Nested Hypotheses', *Econometrica*, Vol.57, No.2 (March), pp. 307–333.
- Weil, J. (2001a), 'Companies Pollute Earnings Reports Leaving P/E Ratios Hard to Calculate', *The Wall Street Journal*, August 21, 2001.