The Media and The Stock Market

by

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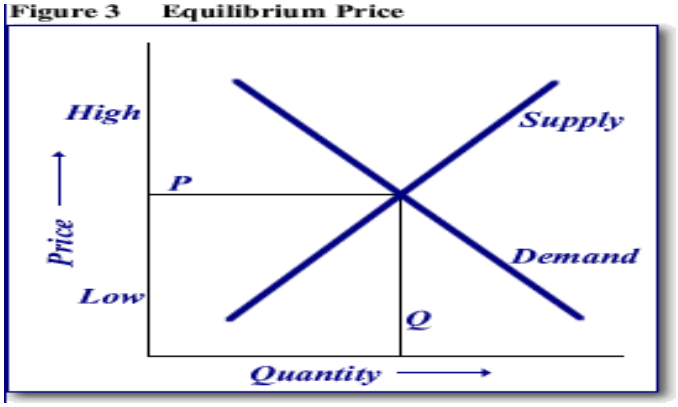
Introduction

A Market is a means by which the exchange of goods and services takes place as a result of buyers and sellers being in contact with one another, either directly or through mediating agents or institutions[1]. Markets in the most literal and immediate sense are places in which things are bought and sold. In the modern industrial system, however, the market is not a place; it has expanded to include the whole geographical area in which sellers compete with each other for customers. Alfred Marshall, who's Principles of Economics (first published in 1890) wrote "the more nearly perfect a market is, the stronger is the tendency for the same price to be paid for the same thing at the same time in all parts of the market.[2]"

Figure 3 Equilibrium Price



The buyers and sellers within a market represent the total supply and the total demand for goods within that market. The demand curve slopes downward as consumers demand more when prices are low and less when prices are low. Inversely, the supply curve slopes upwards as suppliers are willing to supply greater quantities as prices increase. The intersection of these two curves, or the meeting point between consumers and suppliers, represents the equilibrium price of goods as well as the equilibrium quantity of goods at that price. In addition to the slopes of each curve, the curves can shift in direction based on the abilities and preferences of consumers and suppliers.

For example, assume that the equilibrium price of oranges is $1 at an equilibrium quantity of 1,000 units. If there occurred a better than expected orange season, and suppliers had an abundance of oranges such that for the same usual cost they were able to harvest a greater quantity of oranges, they would have been willing to supply a greater number of oranges for a given price in order to sell all of their oranges. This change represented an outward shift in the supply curve. As such, the new intersection of the supply curve and the demand curve will have met at a greater equilibrium quantity and a lower equilibrium price per unit of quantity.

[1] "Market." Encyclopedia Britannica. 2004. Encyclopedia Britannica Premium Service. 18 Feb. 2004 <**http://www.britannica.com/eb/article?eu=118168**>
[2] "Market." Encyclopedia Britannica. 2004. Encyclopedia Britannica Premium Service. 18 Feb. 2004 <**http://www.britannica.com/eb/article?eu=118168**>.

The stock market functions as a market described above. However, the supply curve may be different, for a company issued a fixed amount of shares, and so the supply may have been fixed, shown by a vertical supply curve. With a fixed supply curve and the assumption of no further stock issuances, the equilibrium quantity was fixed and the equilibrium price would have been determined by the position of the demand curve. Investors in stocks represent buyers within a goods market. Shifts in investors' preferences cause shifts in the demand curve which in turn cause shifts in the equilibrium price for a given stock. Therefore, it is the shifts in investor preferences that affect the equilibrium prices of securities.

Literary Review

Five major sources were used for this work along with numerous internet sources and The New York Times; Macroeconomics Principles and Applications, Investing Made Simple, One up On Wall Street, A Random Walk Down Wall Street, and Stocks for the Long Run. The literary sources were used primarily to gain a greater understanding of market efficiency and how the stock market functions. They were also used to become familiar with traditional modes of short-term and long-term investment and investor types. Internet sources such as Encarta.com, Encyclopedia.com and Brittanica.com were also used to gain factual, historical, and functional information about investment, investors, the stock market, and market efficiency. Finally, microfilms of The New York Times and data derived from Finance.Yahoo.com and Bloomberg.com were used as sources the experimentation of the thesis.

Hypothesis

The hypothesis under question is that by determining and utilizing the motivating factors behind the modern form of investment, one could accurately predict changes in stock prices currently considered irrational and unwarranted according to traditional investment and valuation techniques. The hypothesis supposes that there exists an order to the daily changes in securities' prices and fair market values. As means for confining order to the randomness, the hypothesis proposes to use the media as a measure by which to reveal such order. More specifically, the hypothesis will call upon the New York Times as a rubric to delineate an order or pattern within the seemingly random price movements.

Through the development of the technological era, personal computers have become commonplace in many middle income and greater income level households. Those individuals have grown accustomed to using the internet on their personal computers in order to access information and perform tasks that would otherwise require a physical presence or the assistance of an agent or broker. As accessible information and education continue to increase, many retailers and service providers perform their businesses through the internet, while some other businesses become obsolete. One of the major business types to embrace the internet world has been the online brokerage house business. Examples of such businesses include E*TRADE, AMERITRADE, and TD WATERHOUSE. These online trading companies give individuals the liberty to

invest in securities of their choice at their choice, without the use of a physical intermediary such as a stock broker.

The number of individuals investing without stockbrokers, with only online brokerages, increases daily. This shift from stockbrokers has created a shift from the traditional institutional method of investment which used formulas and equations to choose the optimal securities for investment. With the shift towards independent online investment, investors are buying and selling securities with less mathematical and professional decision making techniques.

With the notion that the mode of investment has geared away from more traditional methods, the methods of this new and increasing kind of investor must be identified in order to find logical patterns within the stock market movements.

Coinciding with the earlier description of the stock market, the stock market is a market, and as such it moves by changes in the supply and demand of the present goods. In the case of the stock market, the present goods included in the supply and demand are equitable securities. It is the investment decisions of all the investors, both institutional and technological, that comprise the market's supply and demand. As the number and weight of technological investors displaces the number and size of institutional investors, it is essential to understand the motivation and decision-making process of these new and increasing investors.

Consider that before the internet invasion, the overwhelming majority of stock market investment was performed by stockbrokers and professional investors. Individuals invested their money and savings in the stock market only through these intermediaries, the stockbrokers and investment professionals. The actual investment was therefore, only made by these professionals, individuals whose job and function was to analyze, recommend and invest in the stock market. Because their entire focus was on the stock market and its movements, they used methodical and mathematical decision making techniques when analyzing companies. They were additionally up-to-date and immediate on all stock market and company information. This individual will be labeled investor A, the institutional investor.

After the internet invasion and the development of online trading houses, individuals were able to invest with the absence of a professional intermediary and his fees, with only a small transaction charge per trade in his stead. The individual likely has a profession outside of the stock market, so he spends his day working independent from the investment analysis of current securities. Because this investor is not a professional investor, this investor probably lacks the education and practical experience of Investor A, as well as a lack of timeliness on information and the ability and speed to process the information mentally. This individual will be labeled investor B, the technological investor.

While Investor A uses current information and professional analytical techniques to evaluate the investment attractiveness of a company, Investor B must use all accessible

information, less analytical techniques, and less complex tools for assessing the investment attractiveness of a company. In place of the more professional modes of analysis, Investor B may base investment decisions with the consideration of a "gut" element. This element may include all and any factors that influence an investment decision independent of formulaic mathematical techniques, although their conclusions may be similar. "Gut" factors include any personal and non-investment based affinity towards a company which can ultimately increase the apparent investment attractiveness of that company, recommendations from colleagues or others which create investment attractiveness of that company, and/or positive exposure of a company which may increase the investment attractiveness of that company.

While many issues and stimuli affect the "gut" factor, either independently or together with other factors, the most identifiable measure of "gut" factor is exposure of information. In identifying a mode of exposure, the media provides the most measurable means. The New York Times can be used as this measurable media "gut" factor, as it is written, a newspaper of amongst the largest and widest circulating newspapers, and it may be the most representative in actuality and/or similarity to a primary source of information having a strong independent effect on investment for many investors classified as Investor B.

The New York Times was first issued on September 18, 1851 by founders Henry Jarvis Raymond and George Jones. The newspaper has won ninety Pulitzer Prizes. The New York Times Company is a leading media company with 2003 revenues of $3.2 billion, publishes The New York Times, the International Herald Tribune, The Boston Globe, and sixteen other newspapers; owns eight network-affiliated television stations; and has more than forty web sites. In 2004 the Company was ranked No. 1 in the publishing industry in Fortune's list of "America's Most Admired Companies," for the fourth consecutive year[3]. Readership of the New York Times based on the total average paid circulation as reported by NewYorkTimes.com is 1,118,565 per weekday. Breakdown of these figures consists of approximately 30% single copy sales, 65% home delivery and mail, and 5% other. Based on the *Mendelsohn 2003 Affluent Head of Household Survey*, "Affluent U.S. readers of the New York Times are 39% more likely than the average affluent adult to hold a college or postgraduate degree, 90% more likely to have a household income exceeding $150,000 and 46% more likely to be a top manager." This issue is based on Net Times readership of Sunday/Weekday New York Times.

The hypothesis proposes that both Investor A and Investor B may read and consider The New York Times as well as other widely circulated newspapers as sources of current and useful information. However, the hypothesis proposes that The New York Times may possess a strong enough readership amongst Investors Type B which may base a stronger weight on the contents of its information than an Investor Type A, such that the contents of the information in The New York Times may bear influence on the actual stock prices in the stock market. Additionally, these changes may be seen through

[3] http://www.nytco.com/company.html (4/20/04)

a lag in time as Investor Types B may take time to process or even access the information and later make a formal decision to invest.

Experimental Design

As stated in the Hypothesis, The New York Times is used as the measure for the effect on security price movement in the stock market. In order to effectively calculate the effects on the stock market relative to articles in the New York Times, the experiment first identified positive articles in The New York Times.

In order to create an unbiased sample, microfilms were reviewed of The New York Times in its printed form beginning on June 1, 1998. The sample includes every day's issue of The New York Times excluding The Sunday New York Times. The research was done in this way in order to eliminate bias and view every issue with the same criterion for merit.

Within each issue of the New York Times, the method of research employed consisted of viewing the inside page of the Business Section and reading the summaries. If a summary appeared absolutely positive, in that everything in the summary was consistent with a positive mention of the company, then the article was selected. Once the article was selected, the title was placed under the same inspection for any mention of negativity. If there was still strictly positive mention, the article was skimmed for ten to thirty seconds for content, subject matter, tone, and classification. If the content, subject matter, and tone were all geared towards a financial betterment in the future with no negative mention, then the article was classified as positive.

Once an article was classified as a positive article, it was kept as such regardless of any outside sources or additional New York Times articles in any previous or future dates. If there existed a second article on the same day that was considered negative, then the original article was not classified as positive. When an article passed all of these tests, it was placed in one of five categories; Earnings Growth, Positive Awareness, Stock Appreciation, Acquisition/Internal Investment, and New Management.

The Earnings Growth category was for all articles with the subject focused around earnings. Specifically, articles were selected if they clearly stated that earnings beat expectations. Meeting expectations or any negative mention disqualified the article from this classification. This segment was fairly simple to categorize and should be simple to duplicate. A further important distinction was that the earnings growth should not have been attributed to a single, potentially discontinuing event, but rather from regular operations.

The Positive Awareness category was perhaps the most difficult segment to classify, primarily because it was difficult to distinguish such articles in an unbiased and arbitrary manner. Parallel to the criterion for the Earnings Growth category, the article must be strictly positive. Examples of such articles are those promoting a new patent or

license. Other examples of Positive Awareness articles may include sales growth or expansion into new products.

The Stock Appreciation category was perhaps the easiest category to classify and replicate. For this sector, all articles that wrote positively about a stock price increase, assuming there existed only other positive articles and comments, or no other mention at all, were placed in this segment.

For the Acquisition/Internal Investment category, assuming all mention was positive, companies with mention of being purchased, companies with mention of gaining from purchasing another company, and any mention of a company investing internal funds into the company, were all placed in this classification.

The New Management category did not come up often. This section included all entirely positive articles pertaining to changes in executive management.

Once an article was classified as a positive article and placed in one of the five categories, the date, title, author, and company of positive mention were recorded. Finally, a list consisting of five-hundred and nineteen positive and classified articles were recorded from June 1, 1998 through May 31, 2001. This three year time span included the time preceding and following the "bubble."

Once the positive article list was compiled in chronological order, the closing price from the previous day and the closing price on the current day were recorded for the day preceding the article, the day of the article, the day after the article, and two days following the article. The difference between the closing price the day before and the closing price of the current day was considered the change in price for the current day. Once the actual change for the day was determined, it was translated into a percentage change. The percentage change was calculated by dividing the current change in price by the closing stock price of the previous day. A dummy variable was then set up to represent the change in stock price, where the dummy variable '0' represented a loss, and the dummy variable '1' represented a change greater than or equal to zero.

Dummy Variable	Price Change
0	less than 0
1	greater than or equal to 0

Stock prices, price changes, percentage changes, and dummy variables were set up for the aforementioned four days surrounding an article. When these figures were calculated, the dummy variables from the day of the article and the two days following were summed in order to calculate the total number of days out of three that the stock price change was greater than zero on each given day since the article was released to the general public.

Then, the closing price on the second day after the article was printed was subtracted from the closing price of the day before the article was printed, in order to calculate the total change in stock price since the market was opened on the morning the

article appeared in the New York Times through two days after the article's appearance. This change was then translated into a percentage by dividing the change by the closing stock price from the day before the article was released. A dummy variable was then affixed to this net change, similar to the earlier dummy variable, with a change of zero or greater termed as a '1,' and a change less than zero termed as a '0.'

Finally, the change in price from the close on the day of the article to the close two days after the article had been printed was calculated. This difference was then translated into a percentage by dividing the change in price by the closing price on the day the article was printed. Once the percentage change was derived, a dummy variable was assigned to classify the change as a '1,' greater than or equal to zero, or a '0,' less than zero.

When the above calculations were completed, the mean, median, mode, standard deviation, minimum, maximum, lower quartile, and upper quartile were calculated for each percentage change and dummy variable for the entire given sample.

Samples were broken down in numerous ways in order to help interpret the data set. The first analysis was performed on the sample of the entire five-hundred nineteen positive articles. The articles were then distinguished by the change in stock price on the day before the article was released. The dummy variable separated the entire data set into two large samples, one with a dummy variable value zero and the other with a dummy variable value one. Analysis was then performed on each. The five-hundred nineteen positive article sample was then separated into five categories; Earnings Growth, Positive Awareness, Stock Appreciation, Acquisition/Internal Investment, and New Management. The five samples were analyzed. Then the Earnings Growth and the Positive Awareness groups were further broken down using the dummy variable relating to the change in stock price on the day before the article was issued. The correlation was tested between the changes in stock price on the day before the article was released, against the net change in stock price from the night before the article was written until the close two days after the article was written. An additional correlation was run with the change in stock price the day of the article against the net change in stock price from the closing price on the day the article was released through the close on the second day after the article was issued.

Results

Control

Before exploring the actual experimental results, it is important to first establish a control group.

Dow Jones Industrial			
Statistical	**Actual Change**	**% Change**	**Dum_Change**
Mean	2.79	0.04%	50.99%
Median	3.06	0.03%	1
Mode	28.92	#N/A	1
St Deviation	125.58	1.26%	50.02%
Min	-617.78	-6.37%	0
Max	499.19	4.98%	1
25th Percentile	-70.59	-0.68%	0
75th Percentile	82.55	0.81%	1

Nasdaq			
Statistical	**Actual Change**	**% Change**	**Dum_Change**
Mean	0.63	0.06%	53.64%
Median	5.57	0.23%	1
Mode	61.51	#N/A	1
St Deviation	76.30	2.55%	49.90%
Min	-355.49	-9.67%	0
Max	324.83	14.17%	1
25th Percentile	-38.26	-1.56%	0
75th Percentile	40.24	1.57%	1

S & P 500			
Statistical	**Actual Change**	**% Change**	**Dum_Change**
Mean	0.25	0.03%	50.60%
Median	0.28	0.02%	1
Mode	-2.49	#N/A	1
St Deviation	17.38	1.36%	50.03%
Min	-83.95	-6.80%	0
Max	66.32	5.09%	1
25th Percentile	-9.78	-0.73%	0
75th Percentile	10.67	0.81%	1

A sample was gathered of the Dow Jones Industrial, the NASDAQ, and the S&P 500 containing the open and close prices for the entire index from the period of June 1, 1998 through May 31, 2001. The change in stock price was calculated in the same way it was calculated in the experimental design, subtracting the closing price from the previous day from the closing price from the current day. In this way, the sample is able to account for all changes including after-market variability. The percentage change was recorded by dividing the change by the closing price on the previous day. The dummy variable was then assigned to represent the net change as '1' if it was greater than or equal to zero, and '0' if the net change was less than zero.

The mean value of 50.99% for the Dow Jones industrial indicates that the dummy variable gave a value of '1' 50.99% of the time during the entire period, approximately 1,096 calendar days. This conceptually translates into the recognition that over the sample period, the Dow Jones Industrial Index changed an amount equal to or greater than zero with a similar frequency to the number of times that the index changed an amount less than zero. Considering the sample size, the likelihood of attaining a dummy variable equal to '1' or '0' was equivalent to the likelihood of predicting a 'head' or 'tail' with the flip of a coin. The percentage change if one were to have invested each day at the closing price and then sold the following day at that closing price came out to 0.04% daily, or approximately 10.43% annually assuming 260.71 (365 days * 5/7 trading days per week) trading days per year.

Nearly identical results were found for the S&P 500 Index over the same period. The mean value was 50.60%, yet closer to the probability of a coin toss, and the mean percentage change was 0.03% daily and 7.82% annually. The NASDAQ Index, while not as close to the Dow Jones Industrial Index and the S&P 500 Index to equal probabilities between dummy variables, was relatively close to equal probability was a slightly increased likelihood of experiencing a change greater than or equal to zero. The percentage change was 0.06% daily and 15.64% annually if one were to employ the strategy of purchasing a security at the closing price on one day and to sell at the closing price on the following day. The increased percentages and frequencies in the NASDAQ may be attributed to the greater rate of volatility in the NASDAQ Index relative to the Dow Jones Industrial Index and the S&P 500 Index as indicated by the -9.67% minimum daily change and the 14.17% maximum daily change.

Overall, the indexes indicate that with no information or preference, there was an approximately equal likelihood that the daily stock market price changes would be equal to or greater than zero as they would be less than zero. Additionally, if one employed the strategy of investing at the market closing and then selling on the succeeding day's closing, they would have expected an annualized return between 7.82% and 15.64% with a relatively even frequency of negative and positive/neutral trading days.

Experiment

Overall Figures from All Positive Articles

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	2.51%	68.726%	0.93%	57.143%	0.38%	54.826%	0.22%	53.475%
Median	1.89%	1	0.51%	1	0.29%	1	0.18%	1
Mode	0.00%	1	0.41%	1	0.00%	1	0.00%	1
St Deviation	5.33%	46.41%	4.95%	49.54%	3.24%	49.81%	3.40%	49.93%
Min	-13.73%	0	-21.43%	0	-13.73%	0	-16.25%	0
Max	38.71%	1	31.13%	1	15.21%	1	12.86%	1
25th Percentile	-0.70%	0	-1.66%	0	-1.34%	0	-1.51%	0
75th Percentile	4.89%	1	2.86%	1	2.13%	1	2.02%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.654	1.54%	60.811%	0.59%	58.49%
Median	2	1.26%	1	0.78%	1
Mode	2	0.00%	1	0.00%	1
St Deviation	0.8123143	6.82%	48.86%	4.43%	49.32%
Min	0	-33.19%	0	-16.75%	0
Max	3	39.57%	1	20.79%	1
25th Percentile	1	-1.99%	0	-1.89%	0
75th Percentile	2	4.74%	1	3.07%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	-0.03	-0.03
R-Square	0.001	0.001

The first sample included all five-hundred nineteen positive articles. For this sample, the highest frequency of percentage changes in stock price occurred the day before the article was issued. This result may imply that if the news in the content of the articles were to affect a change in stock price, the largest unified affect occurred during the day preceding the article. A likely reason for such an effect may be that Investor Types A may immediately react to news to make investment decisions rather than waiting to process the information from a newspaper the following morning. This may

imply that information printed in The New York Times may have been released before the close on the previous day by any number of facets, whether it was streamline or headline news, The New York Times online, or any other valid media source.

The mean net percentage change from the close on the night before the articles' issue through the close two days after the article was printed was a net average of 1.54% over a three day period, or 133.56% annually assuming that one invested a fixed amount each day and did not re-invest the profits on the following day. The change on the day of the article, Day 0 showed the greatest average change, 0.93%. This figure came out to 242.45% when annualized on a 260.7 trading day year. Over the three day period, percentage change in stock price was equal or greater than zero an average of 1.65 days. While both of these figures were impressive, showing the greatest net return and the greatest single day return for this sample, they were unattainable as they assumed a purchase price equal to the close the day before the article was issued.

On a single day basis, two days after the article, Day 2 showed a frequency of percentage change greater than or equal to zero barely greater than the frequency for the NASDAQ Index. However, the average daily percentage change on Day 2, at 0.22%, was substantially greater than the NASDAQ Index at an annualized return rate of 57.35% if an investor were to invest at the close on Day 1, the day after the article, and sell at the close on Day 2. Day 1 showed attainable returns substantially greater than the indexes and Day 2 at 0.38% daily, or 99.07% annually. The frequency of percentage change values greater than or equal to zero was 54.8%, a figure greater than the indexes but not by a substantial amount.

The final attainable figure to evaluate was for the difference between the closing price on Day 0 and the closing price on Day 2. One could expect to earn 0.59% over the two day period with a percentage change over the period greater than or equal to zero at a frequency of 58.29%. The median percentage change over the two day period was 0.78% implying that perhaps the expected value of this percentage change was lowered because of a few larger sized negative percentage change differences.

While the percentage changes did show a substantial increase, the relative frequencies for Day 1, Day 2, and the combination of the two did not show a vast increase from the indexes independent of New York Times articles. The percentage change and the frequency of percentage changes greater than or equal to zero were both greatest for Day -1, the day before the article was issued. Therefore, the next step in refining the results was to distinguish the results based on the stock price changes on the day before the article was printed.

Figures from All Positive Articles with Return Greater or Equal to Zero in Day -1

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	4.76%	100.000%	0.80%	56.461%	0.22%	52.528%	-0.02%	50.562%
Median	3.58%	1	0.67%	1	0.14%	1	0.00%	1
Mode	0.00%	1	#N/A	1	0.00%	1	0.00%	1
St Deviation	4.79%	0.00%	4.69%	49.65%	3.07%	50.01%	3.50%	50.07%
Min	0.00%	1	-21.43%	0	-13.73%	0	-16.25%	0
Max	38.71%	1	24.24%	1	15.21%	1	12.86%	1
25th Percentile	1.77%	1	-1.75%	0	-1.33%	0	-1.73%	0
75th Percentile	6.27%	1	2.80%	1	1.82%	1	1.70%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.596	1.01%	59.831%	0.19%	56.18%
Median	2	0.97%	1	0.39%	1
Mode	2	0.00%	1	0.00%	1
St Deviation	0.818368024	6.56%	49.09%	4.43%	49.69%
Min	0	-33.19%	0	-16.75%	0
Max	3	25.25%	1	20.79%	1
25th Percentile	1	-2.47%	0	-2.01%	0
75th Percentile	2	4.21%	1	2.65%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	#DIV/0!	-0.01
R-Square	#DIV/0!	0.000

For this analysis, the sample included every article with a return greater than or equal to zero on Day -1, approximately three-hundred fifty-eight articles. This refinement showed even less of an increased advantage over investing randomly in the stock market with no information than did the larger sample of all positive articles.

While the average percentage change for Day -1 was 4.76% daily, with a maximum change of 38.71% in a single day, an investor would be unable to benefit from such increases as the article did not appear until the following morning. The day of the article showed an average daily percentage change increase of 0.80%, an amount less than the 0.93% daily average for Day 0 in the full sample.

The frequency of percentage changes greater than or equal to zero for Day 1 was roughly comparable to the frequency of the indexes without information. However, the daily percentage change was 0.22%, clearly greater than the stock market on its own merit. The results for Day 2 actually showed figures less favorable than those in the indexes, with a 50.52% probability of experiencing a daily percentage change equal to or greater than zero, and an average daily loss of 0.02%. While the frequency of a net positive change from the close on Day 0 through the close on Day 2 did show a recognizable increase from the frequencies in the indexes, the 0.19% average percentage increase was less than 50% larger than the average daily return for the NASDAQ Index.

One possible reason for these lack luster results could be that the information in the content of the articles was widely known and acted upon before the article was printed in The New York Times, perhaps even before Day -1. Evidence for this reasoning lies in the 4.76% average daily percentage increase, translating into a 1,241% annual return. While this figure was immense, it was unattainable through the use of The New York Times.

Figures from All Positive Articles with Return Less than Zero in Day -1

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	-2.45%	0.000%	1.21%	58.896%	0.71%	59.509%	0.74%	59.509%
Median	-2.02%	0	0.38%	1	0.73%	1	0.37%	1
Mode	#N/A	0	#N/A	1	0.00%	1	#N/A	1
St Deviation	2.16%	0.00%	5.47%	49.35%	3.57%	49.24%	3.11%	49.24%
Min	-13.73%	0	-17.88%	0	-8.67%	0	-7.39%	0
Max	-0.04%	0	31.13%	1	12.04%	1	10.23%	1
25th Percentile	-3.55%	0	-1.49%	0	-1.41%	0	-1.25%	0
75th Percentile	-0.88%	0	3.06%	1	3.17%	1	2.34%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.779	2.67%	62.577%	1.43%	63.19%
Median	2	1.72%	1	1.61%	1
Mode	2	#N/A	1	0.00%	1
St Deviation	0.785866981	7.23%	48.54%	4.32%	48.38%
Min	0	-22.52%	0	-10.69%	0
Max	3	39.57%	1	13.37%	1
25th Percentile	1	-1.20%	0	-1.61%	0
75th Percentile	2	5.82%	1	4.19%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	#DIV/0!	-0.09
R-Square	#DIV/0!	0.009

The average daily decrease on Day -1 for all positive articles with a percentage change less than zero was 2.45%. This figure implied that the opinion of all Investors Type A and B was overwhelmed by a negative outlook for the company's future financial performance. Furthermore, this may then imply that this positive article, if it were to have a positive impact on the change in stock price, would contain information different from the information widely known on the day before the article was released to the general public. This notion was further emphasized by the average daily percentage change on Day 0. The percentage change was 1.21%, an annualized return of 315.46%, far greater than any of the three indexes used as the control group.

While less than the average daily percentage change for Day 0, the daily percentage changes for Day 1 and Day 2 were far above the index averages at 0.71% and 0.74%. The frequency of average percentage changes greater than or equal to zero was actually greater in Day 1 and Day 2 than in Day 0 even though they possessed a lower average daily percentage increase.

The total number of days out of three, from the close on Day -1 through the close on Day 2 was 1.779. The net percentage increase over the same three day period was 2.67% with a 62.577% frequency of three day period percentage increase. While this return and the return in Day 0 were extremely strong, they were potentially unattainable for investors investing after reading the positive New York Times article because they may not have been able to purchase the stock at a price equal to the closing price on Day -1.

Figures which were certainly attainable to readers of the positive New York Times article were the strong positive gains in Day 1 and Day 2 as well as the return if one had purchased the stock at the close on Day 0 and sold at the close on Day 2. The frequency of a net positive percentage change in stock price over the two day period from

the close on Day 0 through the close on Day 2 was 63.19%, a value even greater than the frequency over the three day period from the close on Day -1 through the close on Day 2. The average percentage change for the two day period was 1.43% or 186.43% annually. Additionally, the median was greater than the mean implying that the average return over the period may be higher on average; however there existed greater absolute value percentage decreases than percentage increases.

The correlation between the direction of the percentage change in Day 0 and the net percentage change between the change in closing price on Day 0 and the closing price on Day 2 did not appear significant.

The distinction between the directions of percentage change in Day -1 showed a clear difference in the overall performance of the given stocks relative to their positive articles. The next step was to differentiate the sample data based upon article classification.

Figures for All Articles Termed "Earnings Growth"

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	1.65%	62.602%	1.75%	62.602%	0.42%	56.504%	0.50%	56.098%
Median	1.07%	1	1.00%	1	0.41%	1	0.24%	1
Mode	0.00%	1	#N/A	1	#N/A	1	0.00%	1
St Deviation	4.23%	48.48%	5.32%	48.48%	2.88%	49.68%	2.78%	49.73%
Min	-11.47%	0	-17.88%	0	-8.14%	0	-6.08%	0
Max	24.00%	1	31.13%	1	12.04%	1	12.86%	1
25th Percentile	-1.12%	0	-1.09%	0	-1.40%	0	-1.28%	0
75th Percentile	4.19%	1	3.66%	1	2.19%	1	1.96%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.752	2.68%	66.667%	0.92%	59.76%
Median	2	2.19%	1	0.59%	1
Mode	2	#N/A	1	0.00%	1
St Deviation	0.797634216	6.64%	47.24%	3.97%	49.14%
Min	0	-22.52%	0	-8.15%	0
Max	3	39.57%	1	18.66%	1
25th Percentile	1	-1.22%	0	-1.58%	0
75th Percentile	2	5.24%	1	3.05%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	-0.03	-0.05
R-Square	0.001	0.003

This analysis entailed the isolation of all positive articles categorized as "Earnings Growth" articles. This sample data set included two-hundred forty-seven positive articles, to make it the largest set of the five classifications. This group contained positive articles pertaining to earnings announcements above forecasted expectations.

The frequency of daily average percentage changes greater than or equal to zero was the same for Day -1 and Day 0, and the average daily percentage increases were similar in size to one another. The frequency of net average changes greater than or equal to zero for the three day period from the close on Day -1 to the close on Day 2 was greatest thus far from all other samples, with an average of 1.752 days with positive percentage changes out of three.

The frequencies for Day 1 and Day 2 percentage changes greater than or equal to zero were modestly above the index averages at 56.5% and 56.098%. The actual daily average percentage changes were well above the index averages at 0.42% and 0.50%, or 109.49% and 130.35% annualized, far surpassing the index 7.8% to 15.6%.

The frequency of the net average percentage increase greater than or equal to zero over the two day period beginning with the close on Day 0 and ending at the close on Day 2 was 59.76%, with a 0.92% average percentage change over the period. The correlations for the Day -1 and Day 0 frequencies relative to the three day and two day periods did not appear significant.

Because of the large sample size for the "Earnings Growth" category, the next step in analysis was to break down this category by performance on Day -1 in order to narrow down on articles and their impact on stock price changes.

Figures for All Articles Termed "Earnings Growth" with Negative Return on Day -1

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	-2.27%	0.000%	1.90%	61.290%	0.92%	60.215%	0.61%	56.989%
Median	-1.87%	0	0.64%	1	0.98%	1	0.26%	1
Mode	#N/A	0	#N/A	1	#N/A	1	#N/A	1
St Deviation	1.80%	0.00%	6.00%	48.97%	3.42%	49.21%	2.90%	49.78%
Min	-11.47%	0	-17.88%	0	-8.14%	0	-6.08%	0
Max	-0.04%	0	31.13%	1	12.04%	1	9.55%	1
25th Percentile	-3.41%	0	-1.10%	0	-1.21%	0	-1.29%	0
75th Percentile	-0.90%	0	3.85%	1	3.30%	1	2.30%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.785	3.48%	67.742%	1.54%	60.22%
Median	2	2.70%	1	1.61%	1
Mode	2	#N/A	1	#N/A	1
St Deviation	0.805544136	7.76%	47.00%	4.47%	49.21%
Min	0	-22.52%	0	-8.09%	0
Max	3	39.57%	1	13.37%	1
25th Percentile	1	-1.04%	0	-1.63%	0
75th Percentile	2	6.95%	1	4.76%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	#DIV/0!	-0.01
R-Square	#DIV/0!	0.000

This analysis was a further break down of the "Earnings Growth" category. The analysis sample included only those positive "Earnings Growth" articles with a percentage change on Day -1 of less than zero. The purpose of such a distinction was to set two requirements on such an article as an attempt to increase the actual percentage changes and frequency of those percentage changes.

Over the three day period ranging from the close on Day -1 to the close on Day 2, the average percentage increase was a staggering 3.48% with a 67.742% frequency of a percentage change for the period greater than or equal to zero. One may stipulate that because of the negative return on Day -1, the strong earnings announcement was

unexpected, which may contribute to the maximum increase for the three day period at 39.57%.

The average daily percentage changes for Day 1 and Day 2 were both greater than those for the undifferentiated "Earnings Growth" analysis with 0.92% and 0.61%. The net average return over the two day period assuming a purchase of the stock at the closing price on Day 0 and a sale of the stock at the closing price on Day 2 was also greater than the "Earnings Growth" category for the same period, 1.54% as opposed to 0.92%. In addition to the average daily and period percentage changes being greater with the additional requirement of a negative return on Day 0, the frequencies both daily and over the two day period, for percentage changes greater than or equal to zero were greater with the additional requirement.

Figures for All Articles Termed "Earnings Growth" with Positive Return on Day -1

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	4.00%	100.000%	1.66%	63.399%	0.13%	54.902%	0.42%	55.556%
Median	3.45%	1	1.12%	1	0.28%	1	0.20%	1
Mode	0.00%	1	#N/A	1	#N/A	1	0.00%	1
St Deviation	3.44%	0.00%	4.90%	48.33%	2.45%	49.92%	2.71%	49.85%
Min	0.00%	1	-13.90%	0	-7.06%	0	-4.69%	0
Max	24.00%	1	19.57%	1	6.49%	1	12.86%	1
25th Percentile	1.49%	1	-0.98%	0	-1.52%	0	-1.25%	0
75th Percentile	5.57%	1	3.52%	1	1.85%	1	1.49%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.739	2.20%	66.013%	0.55%	60.13%
Median	2	1.99%	1	0.43%	1
Mode	2	#N/A	1	0.00%	1
St Deviatio	0.792823418	5.83%	47.52%	3.59%	49.12%
Min	0	-14.10%	0	-8.15%	0
Max	3	22.69%	1	18.66%	1
25th Percer	1	-1.96%	0	-1.54%	0
75th Percer	2	5.09%	1	2.38%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	#DIV/0!	-0.09
R-Square	#DIV/0!	0.008

While the additional requirement of a negative return on Day -1 for "Earnings Growth" improved all figures that could reasonably be acted upon relative to "Earnings Growth" without the additional requirement, the sample inclusive of the positive return for Day -1 was weaker than even the "Earnings Growth" category without further classification. The average daily percentage change for Day 2 was 0.42%; however, the same change for Day 1 was only 0.13%. The daily return for Day 1 was the smallest average return for the Day 1 returns in any of the analyses performed thus far.

While the attainable figures underperformed their counterparts, the less attainable figures were closer to the values of their complements. The frequency of a net percentage change in stock price greater than or equal to zero over the three day period ranging from the closing price on Day -1 to the closing price on Day 2 was 66.013% compared with 67.742% for the "Earnings Growth" articles with a negative return on Day -1.

Explanations for this result may reside in the notion that the time lag for an increase in stock price over a period, due to an increase in earnings performance greater than expectations, began to realize before the issuance of The New York Times article, in which case the percentage increase in stock price did not endure with the same effect through the period following the article. Based on these results, if one were to invest based on a positive New York Times article to be classified as earnings growth, they should have preferred a company whose stock showed a percentage decrease in the day prior to the article.

Figures for All Articles Termed "Positive Awareness"

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	2.13%	66.667%	0.42%	53.595%	0.36%	54.248%	0.33%	56.209%
Median	1.61%	1	0.28%	1	0.24%	1	0.38%	1
Mode	0.00%	1	0.41%	1	0.00%	1	#N/A	1
St Deviation	5.11%	47.30%	3.97%	50.03%	3.62%	49.98%	3.66%	49.78%
Min	-13.73%	0	-12.22%	0	-13.73%	0	-15.54%	0
Max	22.59%	1	17.62%	1	15.21%	1	10.20%	1
25th Percentile	-0.55%	0	-1.79%	0	-1.24%	0	-1.50%	0
75th Percentile	3.75%	1	2.22%	1	2.03%	1	2.43%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.641	1.08%	58.824%	0.65%	64.71%
Median	2	1.05%	1	1.23%	1
Mode	2	0.00%	1	0.00%	1
St Deviation	0.774718787	5.91%	49.38%	4.23%	47.95%
Min	0	-18.83%	0	-16.75%	0
Max	3	21.39%	1	10.08%	1
25th Percentile	1	-1.63%	0	-1.26%	0
75th Percentile	2	4.50%	1	2.92%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	0.08	-0.08
R-Square	0.007	0.007

The next most prevalent of the five classifications was the "Positive Awareness" group. This group consisted of one-hundred fifty three articles, large enough to later distinguish further by the performance on Day -1.

Although it would be difficult to replicate and materialize the Day 0 returns as they were calculated using the closing price from the previous day, the average daily percentage change for Day 0 was 0.42%, lower than it had been for any of the analyses thus far. The frequency of percentage changes greater than or equal to zero was also similarly as low, at 53.595%. The three day period beginning at the close on Day -1 and continuing through the close on Day 2, also displayed a relatively low frequency of net percentage change in stock price over the period at 58.824%. The expected return was only 1.08%.

The attainable figures, those from Day 1, Day 2, and the two day period beginning at the close on Day 0 and ending at the close on Day 2, all showed conservative percentage changes. However, it is important to not that the median percentage change for the period from the close on Day 0 to the close on Day 2 was nearly twice the size of the average. This figure, coupled with the strong relative frequency of net percentage change greater than or equal to zero for the same period,

implied that the actual average percentage change was understated. The cause for such effect was the presence of fewer but greater percentage decreases than percentage increases in absolute terms. A similar yet less drastic explanation can be attributed to the low average daily percentage change for Day 2.

In an attempt to separate such percentage change discrepancies as well as to fine tune the results, the next step was to separate this category by performance on Day -1 on the basis of percentage change in stock price being under zero or greater than or equal to zero.

Figures for All Articles Termed "Positive Awareness" with Negative Return on Day -1

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	-2.34%	0.000%	0.21%	52.941%	0.14%	56.863%	1.20%	70.588%
Median	-1.69%	0	0.21%	1	0.60%	1	1.53%	1
Mode	#N/A	0	#N/A	1	#N/A	1	#N/A	1
St Deviation	2.49%	0.00%	4.34%	50.41%	3.55%	50.02%	3.47%	46.02%
Min	-13.73%	0	-12.22%	0	-8.67%	0	-7.39%	0
Max	-0.07%	0	17.62%	1	10.44%	1	9.82%	1
25th Percentile	-3.23%	0	-1.86%	0	-1.53%	0	-0.69%	0
75th Percentile	-0.60%	0	1.89%	1	2.28%	1	3.06%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.804	1.50%	52.941%	1.28%	70.59%
Median	2	0.72%	1	1.53%	1
Mode	2	#N/A	1	#N/A	1
St Deviation	0.775102776	5.87%	50.41%	3.62%	46.02%
Min	0	-14.79%	0	-10.69%	0
Max	3	21.39%	1	10.08%	1
25th Percentile	1	-1.42%	0	-0.56%	0
75th Percentile	2	4.99%	1	3.10%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	#DIV/0!	-0.18
R-Square	#DIV/0!	0.032

The first breakdown of the "Positive Awareness" category was to include only those articles whose company's stock price percentage changes were less than zero. This distinction was an attempt to isolate those positive articles presenting positive information that if they were to cause an increase in stock price, was unknown on the day prior to the articles' issuance as indicated by the lack of increase in stock price change on Day -1.

The frequencies of stock price percentage change greater than or equal to zero for Day 0 and the three day period ranging form the close on Day -1 through the close on Day 2 were even less for this group than for the undifferentiated "Positive Awareness" category. The average return over the three day period was substantial at 1.50%; however, the median was 0.72% as the percentage change over the period implying that the average was overstated due to greater percentage change increases than percentage change decreases in absolute terms.

The most impressive figure in this analysis was the Day 2 frequency and average percentage change. The frequency of Day 2 daily percentage changes greater than or equal to zero was 70.588%, far exceeding the index 50.6% to 53.64%. Similarly, the single day average percentage change for Day 2 in this sample was 1.20% or 312.86% annualized. In addition to the already impressive average daily percentage change, the median value was 1.53%, indicating that a similar average may have yielded an increased average daily percentage increases, however, the percentage change decreases were larger in absolute terms than the percentage increases.

The frequency of percentage changes greater than or equal to zero over the two day period beginning at the close of Day 0 and ending at the close of Day 2 was nearly identical to that frequency of Day 2 at 70.59%. While still impressive, the average percentage increase over the two day period was also close in value to the average percentage increase for the single day of Day 2.

Figures for All Articles Termed "Positive Awareness" with Positive Return on Day -1

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	4.37%	100.000%	0.52%	53.922%	0.48%	52.941%	-0.11%	49.020%
Median	2.83%	1	0.57%	1	0.10%	1	-0.11%	0
Mode	0.00%	1	#N/A	1	0.00%	1	#N/A	0
St Deviation	4.60%	0.00%	3.80%	50.09%	3.66%	50.16%	3.69%	50.24%
Min	0.00%	1	-9.07%	0	-13.73%	0	-15.54%	0
Max	22.59%	1	10.25%	1	15.21%	1	10.20%	1
25th Percentile	1.64%	1	-1.73%	0	-1.18%	0	-1.88%	0
75th Percentile	5.15%	1	2.66%	1	1.71%	1	2.00%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.559	0.87%	61.765%	0.34%	61.76%
Median	2	1.19%	1	0.81%	1
Mode	2	0.00%	1	0.00%	1
St Deviation	0.765254496	5.95%	48.84%	4.48%	48.84%
Min	0	-18.83%	0	-16.75%	0
Max	3	14.29%	1	8.95%	1
25th Percentile	1	-2.00%	0	-1.38%	0
75th Percentile	2	3.83%	1	2.82%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	#DIV/0!	-0.04
R-Square	#DIV/0!	0.002

This analysis included all "Positive Awareness" articles with a positive percentage change in stock price on Day -1, implying that the investors in the market may have already begun to react on the news in the actual New York Times article.

The results for this analysis were far inferior as a predictive and profitable measure relative to the complementary group with a negative percentage change in stock price on Day -1. The results for Day 0, and the results from the three day period ranging from the close on Day -1 through the close on Day 2, were similarly mild, with small average returns relative to other samples.

The average daily percentage change for Day 1 was 0.48%, a significant increase above the Index average increases in a single day. The average percentage change for Day 2 was negative at -0.11%. The frequency of articles with a return less than zero was actually greater than the frequency of percentage changes greater than or equal to zero. This information may make Day 2 attractive from a shorting perspective, in that one may sell a the close on Day 1 with the intention of purchasing at the close on Day 2 at a price 0.11% less than the investor paid.

Figures for All Articles Termed "Stock Appreciation"

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	6.25%	94.048%	-0.65%	47.619%	0.31%	53.571%	-0.71%	39.286%
Median	4.63%	1	-0.28%	0	0.14%	1	-0.68%	0
Mode	#N/A	1	#N/A	0	0.00%	1	#N/A	0
St Deviation	6.81%	23.80%	5.36%	50.24%	3.44%	50.17%	4.23%	49.13%
Min	-10.65%	0	-21.43%	0	-12.24%	0	-16.25%	0
Max	38.71%	1	24.24%	1	10.96%	1	10.68%	1
25th Percentile	2.80%	1	-2.23%	0	-1.34%	0	-3.18%	0
75th Percentile	7.52%	1	1.38%	1	1.92%	1	1.47%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.405	-0.99%	47.619%	-0.40%	47.62%
Median	1	-0.30%	0	-0.20%	0
Mode	1	#N/A	0	#N/A	0
St Deviation	0.851915597	8.18%	50.24%	5.60%	50.24%
Min	0	-33.19%	0	-16.53%	0
Max	3	25.25%	1	20.79%	1
25th Percentile	1	-4.50%	0	-3.15%	0
75th Percentile	2	3.05%	1	2.98%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	0.14	0.05
R-Square	0.019	0.002

This sample consisted of eighty-four articles and included all positive stocks whose subject matter expressed a recent positive change in stock price. Due to the smaller size of this sample, it was not further broken down by the percentage change direction in Day -1.

Articles that fit this category actually showed an average daily return in Day -1 of 6.26%, 1,629.38% annually. The average percentage change in Day 0 however, was negative. Similarly, the three day net percentage change over the period ranging from the closing price on Day -1 through the closing price on Day 2 also showed a negative figure. The frequencies of percentage changes greater than or equal to zero for both Day 0 and the three day period were equivalent to each other as inferior to the frequency of a percentage change decrease, at 47.619%.

While the average percentage change for Day 1 was positive, the key statistic for this analysis was the strong negative average daily return on Day 2. If one were to employ a shorting strategy, they would make the difference of 0.71% daily and 185.01% annually by selling at the closing price on Day 1 and covering the sale by purchasing at the close on Day 2.

The two day period ranging form the closing price on Day 0 to the closing price on Day 2 also showed a negative net average percentage change, implying that the only profitable position to be taken on such articles on average would be a short position. The reasoning behind such movement may be that the stock price appreciated for some unknown reason, and based on the public announcement in The New York Times, more investors chose to realize their windfall than individuals investing in the stock with the expectation that the stock price would continue to increase.

Figures for All Articles Termed "Acquisition/Internal Investment"

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	1.56%	63.333%	0.80%	53.333%	0.26%	46.667%	0.05%	56.667%
Median	0.71%	1	0.41%	1	-0.51%	0	0.07%	1
Mode	#N/A	1	#N/A	1	#N/A	0	0.00%	1
St Deviation	5.66%	49.01%	4.15%	50.74%	3.50%	50.74%	3.96%	50.40%
Min	-7.37%	0	-8.32%	0	-6.16%	0	-9.91%	0
Max	18.00%	1	11.32%	1	11.75%	1	10.95%	1
25th Percentile	-2.30%	0	-1.59%	0	-1.74%	0	-1.86%	0
75th Percentile	4.66%	1	3.27%	1	2.02%	1	0.76%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.567	1.10%	60.000%	0.31%	46.67%
Median	2	1.96%	1	-0.44%	0
Mode	2	#N/A	1	#N/A	0
St Deviation	0.897634183	6.57%	49.83%	5.14%	50.74%
Min	0	-11.86%	0	-11.49%	0
Max	3	17.43%	1	12.46%	1
25th Percentile	1	-4.19%	0	-2.81%	0
75th Percentile	2	3.63%	1	3.35%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	-0.34	0.07
R-Square	0.115	0.005

The rationale behind defining this category as a positive category was that it was assumed that when a company and its employees invest internally, they are stating that they believe their funds will grow with their company rather than in the possession of another company. Additionally, acquisitions articles which were deemed positive on the merit of the subject matter within an article, suggested that the company being purchased, or the company making the purchase was in position to gain financially from the acquisition.

The sample for this analysis included thirty articles, a size perhaps insignificant in itself. Results from this analysis were primarily unsubstantial relative to the index averages, particularly for those days; Day 1, Day 2, and the two day period ranging from the close on Day 0 to the close on Day 2, which could have easily been replicated in practice. However, the average percentage changes for Day -1, Day 0, and the three day period ranging from the close on Day -1 through the close on Day 2 were substantially greater than the index averages.

Figures for All Articles Termed "Management and Internal Decisions"

	Day -1		Day 0		Day 1		Day 2	
	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change	% Change	Dum_Change
Mean	-1.38%	33.333%	0.82%	50.000%	0.88%	50.000%	-0.29%	50.000%
Median	-1.17%	0	-0.03%	0.5	0.41%	0.5	-0.03%	0.5
Mode	#N/A	0	#N/A	0	#N/A	1	#N/A	0
St Deviation	3.35%	51.64%	3.64%	54.77%	3.90%	54.77%	1.55%	54.77%
Min	-6.72%	0	-3.21%	0	-4.57%	0	-3.12%	0
Max	2.78%	1	7.57%	1	7.20%	1	1.37%	1
25th Percentile	-2.81%	0	-0.65%	0	-0.58%	0	-0.50%	0
75th Percentile	0.72%	0.75	1.10%	1	2.16%	1	0.56%	1

	Positive Days	% Change (2-0)	Dum_Change (2-0)	% Change (2-1)	Dum_Change (2-1)
Mean	1.500	1.46%	33.333%	0.58%	50.00%
Median	1.5	-0.98%	0	0.65%	0.5
Mode	1	#N/A	0	#N/A	1
St Deviation	0.547722558	6.63%	51.64%	3.74%	54.77%
Min	1	-3.11%	0	-3.36%	0
Max	2	14.67%	1	6.61%	1
25th Percentile	1	-1.77%	0	-2.46%	0
75th Percentile	2	0.64%	0.75	1.96%	1

	Day -1 vs Total Return	Day 1 vs Later Return
Correlation	-0.71	-0.33
R-Square	0.500	0.111

This sample included six positive articles over the three day period. Even with the small data set, the results showed minimal significance as an indicator of actual daily percentage changes or the frequency of articles with percentage changes greater than or equal to zero. Although found with the small sample, there was a larger correlation for both Day -1 percentage changes relative to the three day periods, and Day 0 relative to the two day period, than the other analyses.

Summary Statistics

Total Day -1 Returns

Analysis Type	Daily % Change	Annual % Change
Stock Appreciation Articles	6.25%	1629.46%
All Day -1 (Positive)	4.76%	1241.00%
PA with Day -1 (Positive)	4.37%	1139.32%
SG with Day -1 (Positive)	4.00%	1042.86%
All Positive Articles	2.51%	654.39%
Positive Awareness Articles	2.13%	555.32%
Sales Growth Articles	1.65%	430.18%
Acquisition/Internal Investment Article	1.56%	406.71%
Management and Internal Decisions	-1.38%	-359.79%
SG with Day -1 (Negative)	-2.27%	-591.82%
PA with Day -1 (Negative)	-2.43%	-633.54%
All Day -1 (Negative)	-2.45%	-638.75%

Total Day 0 Returns

Analysis Type	Daily % Change	Annual % Change
SG with Day -1 (Negative)	1.90%	495.36%
All Sales Growth Articles	1.75%	456.25%
SG with Day -1 (Positive)	1.66%	432.79%
All Day -1 (Negative)	1.21%	315.46%
All Positive Articles	0.93%	242.46%
Management and Internal Decisions	0.82%	213.79%
All Day -1 (Positive)	0.80%	208.57%
Acquisition/Internal Investment Article	0.80%	208.57%
PA with Day -1 (Positive)	0.52%	135.57%
Positive Awareness Articles	0.42%	109.50%
PA with Day -1 (Negative)	0.21%	54.75%
Stock Appreciation Articles	-0.65%	-169.46%

Total Day 2 - Day 0 Return

Analysis Type	Period % Change	Annual % Change
SG with Day -1 (Negative)	3.48%	302.43%
All Sales Growth Articles	2.68%	232.90%
All Day -1 (Negative)	2.67%	232.04%
SG with Day -1 (Positive)	2.20%	191.19%
All Positive Articles	1.54%	133.83%
PA with Day -1 (Negative)	1.50%	130.36%
Management and Internal Decisions	1.46%	126.88%
Acquisition/Internal Investment Article	1.10%	95.60%
Positive Awareness Articles	1.08%	93.86%
All Day -1 (Positive)	1.01%	87.77%
PA with Day -1 (Positive)	0.87%	75.61%
Stock Appreciation Articles	-0.99%	-86.04%

Market Data

Analysis Type	Daily % Change	Annual % Change
Nasdaq	0.06%	15.64%
Dow Jones Industrial	0.04%	10.43%
S&P 500	0.03%	7.82%

These results showed a ranking in order from greatest to least, of the different samples analyzed in terms of average percentage increases and decreases both daily and annually. While this data suggested that nearly all positive articles lead to a return greater than any of the three indexes presented, none of these returns were realistically attainable. It would have been impossible for one to base investment decisions on articles from The New York Times and to have invested the day before an article was issued.

Total Day 1 Returns

Analysis Type	Daily % Change	Annual % Change
SG with Day -1 (Negative)	0.92%	239.86%
Management and Internal Decisions	0.88%	229.43%
All Day -1 (Negative)	0.71%	185.11%
PA with Day -1 (Positive)	0.48%	125.14%
All Sales Growth Articles	0.42%	109.50%
All Positive Articles	0.38%	99.07%
Positive Awareness Articles	0.36%	93.86%
Stock Appreciation Articles	0.31%	80.82%
Acquisition/Internal Investment Article	0.26%	67.79%
All Day -1 (Positive)	0.22%	57.36%
PA with Day -1 (Negative)	0.14%	36.50%
SG with Day -1 (Positive)	0.13%	33.89%

Total Day 2 Returns

Analysis Type	Daily % Change	Annual % Change
PA with Day -1 (Negative)	1.20%	312.86%
All Day -1 (Negative)	0.74%	192.93%
SG with Day -1 (Negative)	0.61%	159.04%
All Sales Growth Articles	0.50%	130.36%
SG with Day -1 (Positive)	0.42%	109.50%
Positive Awareness Articles	0.33%	86.04%
All Positive Articles	0.22%	57.36%
Acquisition/Internal Investment Article	0.05%	13.04%
All Day -1 (Positive)	-0.02%	-5.21%
PA with Day -1 (Positive)	-0.11%	-28.68%
Management and Internal Decisions	-0.29%	-75.61%
Stock Appreciation Articles	-0.71%	-185.11%

Total Day 2 - Day 1 Return

Analysis Type	Period % Change	Annual % Change
SG with Day -1 (Negative)	1.54%	200.75%
All Day -1 (Negative)	1.43%	186.41%
PA with Day -1 (Negative)	1.28%	166.86%
All Sales Growth Articles	0.92%	119.93%
Positive Awareness Articles	0.65%	84.73%
All Positive Articles	0.59%	76.91%
Management and Internal Decisions	0.58%	75.61%
SG with Day -1 (Positive)	0.55%	71.70%
PA with Day -1 (Positive)	0.34%	44.32%
Acquisition/Internal Investment Article	0.31%	40.41%
All Day -1 (Positive)	0.19%	24.77%
Stock Appreciation Articles	-0.40%	-52.14%

Market Data

Analysis Type	Daily % Change	Annual % Change
Nasdaq	0.06%	15.64%
Dow Jones Industrial	0.04%	10.43%
S&P 500	0.03%	7.82%

These figures represent the attainable results if the experiment was to be replicated. On average, the greatest annual return was found by identifying a positive article classified as a "Positive Awareness" article with a stock price percentage change less than zero the day before the article was printed in The New York Times. Overall, there were numerous options on a given day from which to choose in order to beat the S&P 500 Index. Additionally, there were also short opportunities which became apparent, particularly with "Stock Appreciation" articles on Day 2.

Conclusion

The Gruenbaum Theory of Security Price Efficiency called to question the accuracy and immediacy of modern day efficient markets. The theory suggested that markets were inefficient by means of short term standards. This suggestion implied that the assumption of immediate and conclusive reactions in security pricing was incorrect. Rather, security price corrections due to changes in market awareness and perception did not occur instantaneously, but over a time period.

The results have shown a clear and substantial difference in real annualized returns based solely on articles printed in The New York Times. Rather than attempting to formulaically predict the affects of new information on stock price valuation through

static mathematical equations, the Gruenbaum Theory of Stock Price Efficiency relied upon the existence of present factors to carry through in the immediate days proceeding an article's release.

Most professional investors, Type A Investors, measure their performance against the S&P 500 annual return and define their investment success relative to the 7.82% annual return. With the Gruenbaum Theory of Security Price Efficiency, a Type B Investor would expect to realize returns far exceeding the returns of the S&P 500.

The Theory and analysis showed a clear and substantial relationship between positive articles in The New York Times and stock price increases. Therefore, articles in The New York Times could be further used by investors to predict and benefit from price increases in stock prices due to their correlation. More so, the further classifications of article type and past performance helped to predict future stock price changes with even greater accuracy and magnitude. The theory could then be employed as a strong Day-Trading strategy. It is important to note that this correlation, does not in any way dictate causation. However, the correlation is enough to exploit the stock price reactions and benefit an investor.

The self-fulfilling prophecy also plays a large part in the validity of this theory. The general implication of a self-fulfilling prophecy is that the belief or practice of a given idea in and of itself helps to bring forth the verdict under assumption. For this particular theory, the self-fulfilling prophecy helps to increase the frequency and size of stock price changes greater than or equal to zero, hence strengthening the theory. The reason ensues that if one practices the utilization of The New York Times as a means for stock investment, they would in fact be creating an increased demand for a given stock. This increased demand would cause the equilibrium price for the given stock to increase. The further increase in stock price would only further verify the validity of the theory, and so it is self-fulfilling.

Finally, the theory emphasizes that company performance and stock performance are two possibly unrelated matters. The equilibrium price determined for a given stock is dependent on the intersection of the supply curve and the demand curve. Rather than assuming that it is company performance that dictates the intersection of the two curves, one must realize that it is the preference of investors that dictates the movements of supply and demand. In order to predict stock price movement, one must predict the future actions of investors above all factors, for it is they that dictate future prices. To understand the future stock price movements for a given company, one must first know the investors of the company before they know the company itself.

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