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STOCK TRADING AND PROBABILITY

A Minor Qualifying Project Report

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By


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Abstract

This project is a study of stock market strategies. Various approaches to investing are discussed and implemented through the course of a nine-week simulation.

Topics include a discussion of stock indicators, momentum-based investing, option trading, and a mathematical investing tool. Conclusions are based upon our research and the results of our simulation.

Acknowledgments

We would like to thank Professor Dalin Tang for his guidance during the course of this project. He gave us focus, and helped us to tame the wild animal that our project had become. Also, we would like to thank David Morin, whose input was invaluable to this project. He provided the resources to help us with the mathematical portion of the project and helped us to understand the basics in option trading.

Table of Contents

Chapter 1: Introduction

| | |
|---------------------|---|
| 1.1 Introduction | 4 |
| 1.2 Methodology | 4 |
| 1.3 Project Outline | 5 |

Chapter 2: Strategies

| | |
|--|----|
| 2.1 Our Investment Strategies | 7 |
| 2.2 Stock terminology | 8 |
| 2.3 Research | 10 |
| 2.4 Growth Investing vs. Value Investing | 11 |
| 2.5 Stock Indicator strategy | 12 |
| 2.5.1 Primary Indicators | 12 |
| 2.5.2 Secondary Indicators | 18 |
| 2.5.3 Other Indicators | 26 |
| 2.6 100% Movers Strategy | 30 |

Chapter 3: Options

| | |
|----------------------------------|----|
| 3.1 Introduction to Stock Option | 33 |
| 3.2 Option Terminology | 33 |
| 3.3 What are Options | 36 |
| 3.4 Writing Options | 37 |

| | |
|---|-----|
| 3.5 Selling Options | 37 |
| 3.6 Exercising Options | 38 |
| 3.7 Expiring Options | 38 |
| 3.8 Summarizing option Trading | 39 |
| 3.9 Option Flowchart | 40 |
| Chapter 4: Mathematical Tools for Stock Picking | |
| 4.1 Introduction | 41 |
| 4.2 Forecasting the size of a move based on volatility | 43 |
| 4.3 Calculating the probability of a future stock price | 46 |
| 4.4 Equation References | 49 |
| 4.5 Explaining the Formula step by step | 51 |
| Chapter 5: Company Information and Transactions | |
| 5.1 Purchased Stocks | 55 |
| 5.1.1 Cisco Systems | 55 |
| 5.1.2 Intel Corporation | 61 |
| 5.1.3 Wal-Mart | 68 |
| 5.1.4 EMC Corporation | 73 |
| 5.1.5 Four Seasons | 81 |
| 5.1.6 Elantec Semiconductors | 86 |
| 5.1.7 Harley-Davidson, Inc. | 93 |
| 5.1.8 MetLife | 98 |
| 5.1.9 Vertex Industries | 104 |
| 5.1.10 Green Mountain Coffee, Inc. | 108 |

| | |
|---|-----|
| 5.2 Stocks Researched but not Purchased | 112 |
| 5.2.1 Boeing | 113 |
| 5.2.2 Coca Cola | 115 |
| 5.2.3 Diagnostics Products | 117 |
| 5.2.4 Dupont | 119 |
| 5.2.5 Fuji Photo | 121 |
| 5.2.6 General Electric | 123 |
| 5.2.7 Honda | 125 |
| 5.2.8 International Business Machines | 127 |
| 5.2.9 Sony Corporation | 129 |
| 5.3 Stock Transactions | 131 |
| 5.4 Options Transactions | 131 |
| Chapter 6: Conclusions | 132 |
| Bibliography | 139 |

Chapter 1 - Introduction

1.1 - Introduction



The stock market is often a volatile and unpredictable beast. It may not be possible to truly understand all of the factors that contribute to the fluctuations in the market or even in a particular stock. The market is so volatile that one cannot always predict what will happen next. Despite this fact, many investors consistently succeed in the stock market. Do the successful investors know some secret “tricks” that the rest of us don’t?

It is our belief that an investor may be able to “win” at the stock market by making educated decisions. In this project we are concerned with researching and implementing methods that will increase the chances of picking “winners.” We are hoping that this project will guide the reader to be more successful in the stock market.

1.2 - Methodology

Perhaps the best way to learn about the stock market is through experiencing it first hand. In this project our group attempted to garner knowledge of the market by

immersing ourselves in a nine-week stock market simulation. In this simulation, we put ourselves in the role of an investor in the stock market. Each week, we tested our strategies by buying and selling various stocks and options. The simulation began on September 18, 2000 and was completed on November 17, 2000. We limited our funds to \$110,000 imaginary dollars. We invested \$10,000 for every stock that was purchased, and \$2,000 for every option that was purchased. Not only does the monetary limit make the simulation more realistic it also makes option trading more attractive. We will try our best to explain the use of an option and show how an investor can make more money proportionally while trading options. We researched various companies and purchased stocks that seemed like “good buys” according to our strategies. We will discuss all our strategies in detail and try to show which methods worked best and why.

1.3 – Project Outline

We started this project with many ideas and finally ended up focusing on four different concepts throughout this project. In chapter two, we describe certain stock indicators that we used in our investment strategy. Stock indicators tell the investor how healthy a company is financially. Stock Indicators describe company attributes such as available cash, debt, and profit margin. We ended up using approximately 30 indicators; some were integral to our project while others were not so important. This strategy is great for long-term investing, but for short-term investing other strategies could be more effective.

The second strategy, called “The 100% Movers Strategy,” is also discussed in chapter two. This strategy is simple and straightforward. It involves examining a stock at five different time periods to see if it is on an upward trend. If the stock is found to be on an upward trend, we purchase the stock.

Chapter three discusses option trading. There are many different strategies that we could have applied to option trading but we did not want to become too involved with this aspect of the project. So, in the end, we decided to use a very simply method know as buying “calls”.

Finally in chapter four we describe a “Mathematical Tool” that is supposed to predict how a stock will perform in the future based upon the stock’s recent performance. We attempt to determine if making investment decisions based upon this tool is a viable strategy. We used this tool only to test its accuracy. We did not use this mathematical tool as a guide to pick our stocks.

In chapter five we report our results and describe each company that we traded. We also describe the companies that we researched but chose not to invest in because our research showed us that these companies did not have a stable infrastructure.

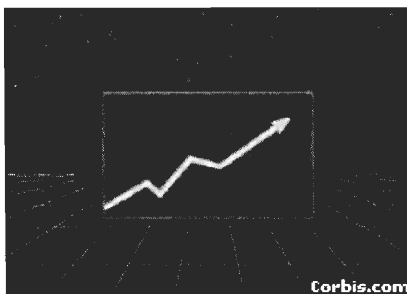
In the final chapter, we discuss what happened throughout our project. We analyze our results and compare them to other indexes like the DOW, S&P500, and NASDAQ. Finally, we attempt to draw some conclusions based upon our research.

Chapter 2 - Strategies

2.1 – Our Investment Strategies

Our group researched and implemented various investment strategies during the course of this project. One strategy that we implemented was to use various **stock indicators** to analyze a stock. Stock indicators are various pieces of data about a stock that help an investor determine if it's a good stock to purchase. Indicators are based on the stocks past performance and details about the company itself, such as its sales and debt. One fault with strategy is that it's particularly useful for long-term investing. Our simulation is short-termed, only nine weeks in duration.

Another strategy we used is called the **100% Movers method**. This strategy is more suitable for a short-term stock market simulation. By using both the 100% movers



and the stock indicator methods together an investor is able to analyze a stock more effectively. The goal of the 100% Movers strategy is to catch the momentum movers on an upward trend. By using charts and calculating the

percentages of the past 5-year, 2-year, 1-year, 3-months and 1-month trends, the strategy helps an investor make a better trading decision.

Options play a considerable role in this project. The potential of trading options greatly outweighs that of traditional stock trading. Option traders have the potential to

double their investment in one day of trading, based on a +10 % stock price move. With the potential of making more money quicker, there is also the risk of losing a huge portion of your investment. There are many different types of strategies to buying and selling options. We are only going to use option “calls,” but we will explore other methods and strategies to some extent to give a better illustration of the whole process of option trading.

Another strategy that our group discovered in our research is a mathematical tool that uses several mathematical equations to predict the probability that a stock will reach a certain price. The formula uses the history of the recent stock prices to predict what its future stock price will be. We will examine this formula closely, but we will not use this mathematical tool to judge our stocks. This mathematical tool does not take into account quarterly earnings, sales, lawsuits and other unseen situations that could cause a stock to rise or fall quickly. The mathematical tool is based on the past 20 days of closing stock prices. We will run a mathematical program for all the stocks that were chosen for this project. We will then explain the results that the program computed and compare those results to actual results. Our goal is to determine how accurate the mathematical tool actually is.

2.2 - Stock Terminology

Here, we introduce some basic stock terminology that is used throughout the project.

Assets - Assets are things you own, such as cash, real estate, stocks, and bonds. From a business perspective, assets also include inventory. On a balance sheet, assets contribute to the positive side, and liabilities contribute to the negative side

Account receivables - Money owed to a company by its customers; it qualifies as an asset because the company expects the money to be paid to it within a year.

Cash flow - A measurement of the money going into and coming out of a company. If a company has negative cash flow, this means the company must borrow money to operate its business. If a company has positive cash flow, the company has money to spend.

Dividends - An amount of money or stock that a corporation pays to its shareholders quarterly.

Earnings – The amount of money that a company keeps as profit.

Equity - Ownership. When you own part of something, you have equity in it.

Return on equity - A percentage that indicates the rate of return to shareholders by dividing net income by total shareholders' equity.

Liability – A financial obligation, or the cash outlay that must be made at a specific time to satisfy the contractual terms of such an obligation.

Liquid asset – Asset that is easily and cheaply turned into cash. This includes cash itself and short-term securities.

Market price - The price or last reported price at which a security is currently trading.

Portfolio - A collection of investments, real and/or financial.

Securities - A general term for publicly traded stocks, bonds, and other financial Instruments.

Shares outstanding - The shares of stock that are owned by investors.

2.3 - Research

Our group used **Value Line** to collect most of the data covering the stocks that were chosen for our researched. Certain other data was found online from www.quote.com, www.excite.com, and finance.yahoo.com. Yahoo was our main source for finding daily values of stocks and other useful information, such as charts and graphs.

Much of the information that we used for our Stock Indicator Strategy was derived from the book “The Neatest Little Guide to Stock Market Investing,” which we found to be an invaluable tool. This book also helped define the fundamental workings of the stock market in general. Further information, including definitions of common

stock market terms and concepts, such as options came from web sites: Yahoo, Excite, Quote.com, and www.invest-faq.com. Information concerning the mathematical tool was derived from Fishback's "Odds, The Key to 90% Winners: Applying Volatility Analysis to Option Trading".

2.4 - Growth Investing vs. Value Investing

Two basic types of investing are growth investing and value investing. While the two investment strategies are contrary to one another, an investor doesn't necessarily subscribe to one school of thought or the other. Most investors fall somewhere in the middle of these two schools and many successful investors combine the two strategies.

A growth investor attempts to find companies that are growing and will continue to grow rapidly. These are called growth stocks. Often the company earnings are increasing at a rapid pace as the stock price is following along. Therefore earnings growth is important to a growth investor. People who subscribe to this school of thought are sometimes called momentum investors.

A value investor attempts to find companies that represent good values. These are called value stocks. A value stock is one such that the stock price is lower than its true value. It is the hope of the value investor that the market will eventually recognize the true value of the stock and the price will increase. Value investors are concerned with things like a company's book value, earnings, and revenue. People who subscribe to this school of thought are sometimes called fundamentalists because they focus on the fundamentals of the company.

2.5 - Stock Indicator Strategy

Stock Indicators are pieces of information about a stock or company that helps the investor to evaluate the stock. There are many different types of indicators and technical analysis that an investor can use. In fact, through our research we have found over 100 different types of indicators. With so many different types of indicators out there, an investor can become overwhelmed with so much information. We researched many of these indicators and decided to use 30 indicators that we believed that were the most important ones. Some indicators are important for value investing while others are important for growth investing. For each company that we researched, we have a stock indicator worksheet that has all the indicators listed on it.

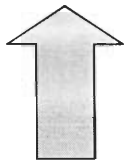
2.5.1 - Primary Indicators

These indicators were the primary indicators that we used to evaluate stocks. A stock would have to satisfy a certain criteria for each indicator before we would purchase it.

Net Profit Margin

A Company's net profit margin is determined by dividing the money that was left over after paying all its expenses by the money it had before paying expenses. For

example, if a company makes \$1 Billion and pays \$900 Million in expenses, its net profit margin is 10%. Companies with high net profit margins keep more of what they earn. If two companies in the same industry had a 10% and 20% net profit margin, an investor would want to choose the company that earned 20%. Also, we looked at the net profit margin for the past five years. This help us to determine if the company has been solid, weak, or on a recovery. Our strategy will be looking for companies that have high net profit margins.



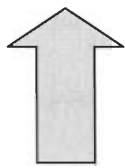
Look for high Net Profit Margin the higher the better.

Cash and Debt

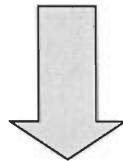
Cash means: how much money at this very moment that a company has in a bank account or some type of security. Cash on hand is very important to these companies, as it will help them deal with many different types of situations. Companies that want to invest in their future businesses must spend money on research for new products, factories, equipment, and many other elements to help insure future success.

Debt on the other hand can be detrimental for a company future. For example, if a company is valued at \$1 billion and has \$500 million of debt, and has hardly any cash on hand, an investor may want to avoid that company. If that company had any unexpected problems with their products or services, a large debt would add to that company's misfortune. The company would most likely slow its growth, resulting in

lower stock prices. Ideally, we would like companies with lots of cash and little or no debt. These companies are better equipped to handle unexpected problems.



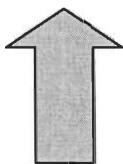
Look for companies with lots of cash.



Look for companies with little or no Debt.

Current Ratio

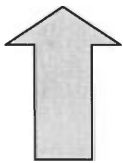
Current Ratio is the company's current assets (typically cash + receivables + inventory) divided by the current liabilities (debt due within a year). For example, if a company has \$ 1billion of current assets and \$750 million in liabilities it's current ratio would be 1.33, ($\$1 \text{ billion} / \$750 \text{ million} = 1.33$). This ratio gives you a sense of a company's ability to meet all short-term liabilities with liquid assets, should it need to. The more assets a company has in relationship to its liabilities, the better it will be able to handle unexpected surprises. This ratio is an adequate measure of financial strength in the short term, and can be used on a comparative basis among companies. Our investment criteria was for each company to have a current ratio of at least 2 (2 to 1).



Look for Current Ratio of at least 2. Higher the better.

Quick Ratio

Quick ratio is a measure of a company's ability to meet its short-term financial obligations with its liquid assets. Quick Ratio divides the company's current liquid assets (cash, accounts receivable, marketable securities) by its current liabilities. For example, if a company has \$2 million in liquid current assets and has \$4 million in current liabilities the quick ratio would equal .5, ($\$2 \text{ million} / \$4 \text{ million} = .5$). Quick ratio is stricter than the current ratio when evaluating how prepared a company is to deal with short-term crises or opportunities. A solid quick ratio tells an investor that the company is very prepared for short-term obligations. Our investment criterion was for each company to have a quick ratio of at least .5. That is, the company should have half as much in cash as liabilities.

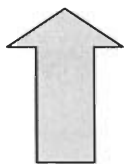


Look for Quick Ratio of at least .5. Higher the better.

Cash Flow per Share

Cash flow per share means the company is receiving in a timely fashion the profit that it's owed. Cash flow per share is calculated by dividing sales by the number of shares outstanding. For example, ($\$4 \text{ million in sales} / 1 \text{ million shares outstanding} = \4 per share). Companies that we will buy must have a positive cash flow per share. For

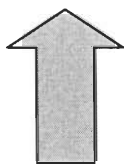
growth companies, it is important that the cash flow per share has increased in each of the past five years and is projected to increase again this year and next.



Look for Cash Flow Per Shares that have increased in each of the past 5 years and the next 2 years.

Earnings per Share (EPS)

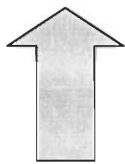
Earnings per share is what a company has earned divided by the number of shares outstanding. For example (\$2 Million in earnings / 2 Million outstanding shares = 1.0 EPS). The more a company earns, the more successful it is and the more desirable it becomes to other investors. If the company's earnings per share increase quarter after quarter at a faster rate, that's called earnings momentum. Earnings momentum is a popular way to identify solid growth companies. For growth companies, it is important that the earnings per share has increased in each of the past five years and are projected to increase them again this year and next.



Look for (EPS) that have increased in each of the past 5 years and the next 2 years.

Sales per Share

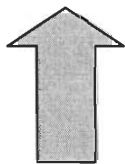
Sales per Share is simply sales divided by shares outstanding. For example, (\$10 million of sales / 2 million shares outstanding = \$5 sales per share). This helps draw a picture to see how much an investor is paying for a piece of those sales. There is no ideal figure for sales per share. Small-cap investors often prefer it small while large-cap investors usually don't care as it relates to price. For growth companies, it is important that sales per share has increased in each of the past five years and are projected to increase them again this year and next year.



Look for Sales Per Shares that have increased in each of the past 5 years and the next 2 years.

Five Year Sales and Earnings Gain

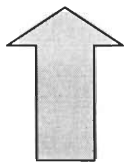
Here, the investor is looking for the 5-year average of annual gains for sales and earnings. Companies that have turned out higher sales and earnings consistently year after year are more desirable to keep. Our strategy requires an average of at least 10% a year over the past five years for larger. For small companies, our requirement is a 15% average annual gain.



For larger companies look for of at least 10% growth in earnings and sales in each of the past 5 years. While Small companies require 15% average gains.

Projected Sales and Earnings

Projected Sales and Earnings show how companies are projected to grow in the next five years. An investor would not touch a company that is predicted to have negative sales and earnings in the next five years. Large companies should be expected to grow at least 10% a year, medium companies at least 15%, and small companies at least 20%. Smaller companies should be growing faster than larger companies because they have more room to grow.



Projected sales and earnings should be growing at rate of 10% a year for the next 5 years for large companies, 15% for medium companies, and 20 % for smaller companies.

2.5.2 - Secondary Indicators

These indicators are also important, although not as important as the primary indicators. The secondary indicators won't necessarily make or break a stock's evaluation, but they are important to keep in mind.

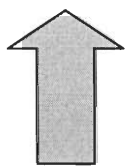
Market Cap

This shows how big the company is. To calculate the market capitalization, multiply the outstanding shares by the current stock price. For example, (4000 million

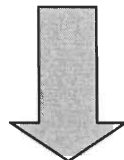
outstanding shares x \$66 current stock price = \$264,000,000,000 billion). Knowledge of the size of a company helps an investor diversify his or her portfolio. Also, a smaller company, while a riskier investment, also has more potential for growth. Company size: Gaint>\$25 Bil, Large \$5 Bil-\$25 Bil, Medium \$1 Bil-\$5 Bil, Small \$250 Mil-\$1 Bil, Mirco <\$250 Mil. Our strategy is to have both large and small cap companies in our portfolio.

52 Week High and Low

This is just the high and low of a stock price over the past 52 weeks. Our strategy for growth investing is to purchase the stock near its high over the past 52 weeks. Our hope is that the stock price would continue to rise to newer highs. While on the other side there is value investing, were the investor hopes to buy a stock at the middle or even at the low of the 52 week stock price range. Value investors are looking for bargains. They are hoping to find good companies that are just coming out of their financial problems, and are poised for a turn around.



Growth investors buy near or at 52 weeks high/low.



Value investors buy at middle or bottom of the 52 weeks high/low.

Sales

This indicator shows how much business your companies are doing. Small cap investors would probably prefer smaller sales, because the Mutual Fund Family investor has not yet discovered these companies. Small cap investors are hoping that Mutual Fund Families that will discover these companies and will drive the stock prices to new highs. Bigger is always better, but small sales will grow faster than big sales. It's easier for a \$100 Million dollar company to double in size than a \$25 Billion dollar company. Small cap investors must be careful, because they can lose their investment just as easy if that company fails to perform. Our strategy will be using both small and large sales for this project.



Timeliness and Safety

Timeliness is a prediction of how well the stock should perform relative to all other stocks in the next 12 months. Safety is a measure of a stock's volatility as compared to its own long-term record. Each is on a scale 1 to 5, with 1 being the best. Our investment strategy looks for a timeliness of 1 or 2. For safety, a wider trading history could be better, because it means there's a better chance the stock will rise. That translates into a poor safety rating, perhaps a 4 or 5.



Dividend Yield

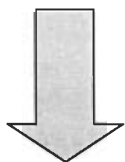
Dividend yield is the company's annual cash dividend per share paid out to the investors divided by its current stock price. For example, (\$2 annual dividend per share / \$15 current stock price = 0.133 or 13.3 % dividend yield). With the exception of high tech companies, large companies should have high dividend yields. Small cap investors ignore dividend yield because small companies don't usually declare dividends and therefore have yields of zero. Ideally we are looking for a mix of high dividend yields with the potential of growth companies.



Current Price to Earnings (P/E)

Current Price to Earnings shows you how much you're paying for each dollar of the company's earnings. It's simply the current stock price divided by the earning per share for a 12-month period. For example, a stock selling for \$40 a share that earned \$2 last year and is projected to earn \$4 next year has a trailing P/E of 20 ($\$40 / \$2 = 20$) and a forward P/E of 10 ($\$40 / \$4 = 10$). The P/E ratio provides insight into valuation using an easily understood measure: earnings. Stocks with high P/Es compared to the overall market are typically growth stocks. Investors are willing to pay a premium because they

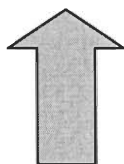
expect the company's earnings and stock price to rise. Stocks with low P/Es are sometimes considered value stocks. Because earnings are volatile, and sometimes "negative," the P/E has its limitations and may fail as a measure for a significant number of stocks at any given time. For value investors, P/E should equal the earnings-growth rate, the lower the P/E the better. A P/E that's below the five-year average is another positive sign. For growth companies the P/E should be higher than the average stock but it shouldn't affect an investor's decision very much because there are more important measures for growth investing.



Value investors, P/E should equal earnings/growth rate, while growth investors don't pay too much attention to it. Smaller is always better.

Average Price to Earnings

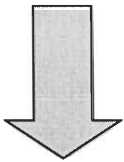
Knowing this number will let you see how the current P/E measures up to the stock's recent trading levels. Simply add up the five average annual P/E ratios and divide by five. A stock with a higher 5-year average P/E ratio compared to the current P/E ratio means a stock could be trading at level below its normal trading range, and that relates to a positive sign. We would like the average P/E to be higher than the current P/E.



The average of the past 5-years P/E ratio should be higher than current P/E ratio.

Price to Book (P/B)

Best used for comparisons within an industry rather than between industries, price to book compares a stock's price to how much the stock is worth right now if somebody liquidated the company. It tells an investor how much he or she is paying for the actual assets of the company. For example, imagine that the owner of a company took all the company's office space, computers, desk, equipment and so on and went to the local business auction. If he/she received a sum of \$5000 for everything and there were currently 10 shares of stock outstanding, the book value per share would be \$500. A P/B of 1 means the investor is paying the auction price for a company. A P/B less than 1 means the investor is paying less than auction price. A P/B greater than 1 means the investor is paying more than the auction price. Our strategy for value investing is to look for a P/B of .66 or less. Growth investors don't care at all about P/B.

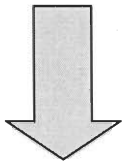


Value investors: $P/B < 0.66$. Growth investors don't care. P/B are best used as comparisons within an industry. Smaller is better.

Price to Sales (P/S)

Price to sales is a more accurate measure of a company's value because sales can't be manipulated as easily as earnings. Also, the measure helps growth investors identify companies that are selling below their potential. Even growth companies are best purchased cheap. Simply divide the current stock price by the sales per share (sales-

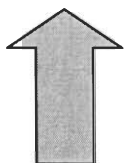
per-share is arrived at by dividing total revenue by shares outstanding). For example, if a stock is selling for \$72 per share and is expected to report sales per share of \$48 this year, its P/S ratio is 1.5 ($\$72 / \$48 = 1.5$). For all companies except utilities, a smaller P/S is better. Ideally we are looking for P/S below 2.



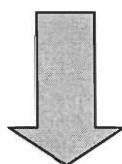
Ideally P/S should be below 2. Smaller is better.

Insider Buy/Sell/Own

This is the percentage of employees that buy shares of stock in their own company. If the people who run the company have a material interest in the company's success, they're more likely to do a better job. The more insider ownership a company has, the better. A 15% insider ownership is a good value. For smaller companies, insider ownership is of particular importance because a lot of small companies are just starting out and management is a crucial factor in their success. As for sell, an investor shouldn't pay too much attention to the insider sells. Sale of a stock does not necessarily mean that the insider thinks the future is looking dismal; it's more probable the insider simply needs extra cash. Insider buys is a good indicator to see if their own people believe in themselves. The more insider buys the better.



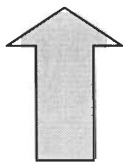
Insider ownership: at least 15%. Insider buys: the more buys the better.



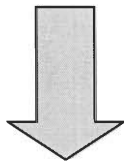
Insider sells: the smaller the better.

Five Year Price Appreciation

This represents how much the stock price has changed over the past five years. The price appreciation is found by taking the high price from five years ago and comparing with the current price. For example, a stock traded at a high of \$22 five years ago and is trading at \$95 today is $(95/22 - 1 = 3.32)$ a 332% increase. There's no rule for this number. For value investing we would prefer to see a decrease from five years ago. As for growth investing we won't touch a stock that has lost money in the past five years. Growth investors want a larger value for price appreciation.



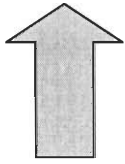
Growth investing: look for at least 250% increase over the past 5-years.



Value investing: look for a decrease over the past 5-years.

Max/Min

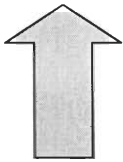
This is just the stock's projected maximum gain and it's projected minimum gain over the next year, both expressed as percentages. Bigger is better for both maximum and minimum projections. The investor should not touch a stock that's predicted to have a "negative" maximum gain.



Maximum projection should be at least 20%. Minimum should be no less than 5%. Bigger is always better for both projections.

Projected High/Low

This is a measure of how much an investment is projected to be worth in the future. Both high and low projection should be higher than the current price. Bigger is better for both the high and low.



Both high and low projections should be higher than the current price.

2.5.3 - Other Indicators

These are indicators that our investment group researched, but did not use for this project. One reason that our group didn't use some of these indicators is that the information is not easily accessible.

Daily Dollar Volume

This tells an investor how much money is traded in the stock on a given day. A high value means that the stock is heavily bought and sold. To calculate the daily dollar volume, multiply a stock's average daily trading volume by its share price. For example,

(30,470,700 average volume x 66 ¾ current price = 2033 Mil). Small Caps investors look for low daily volume, less than \$3 million, because this means the stock isn't part of mutual fund portfolios. Mutual fund institutions don't want to start investing in such low volume companies because it becomes very difficult for them to sell their shares if the company begins to lose its appeal to investors. However, when the institutions begin to buy in bulk the stock price will begin increasing rapidly. Large cap investors don't pay much attention to daily volume.

Stock Buyback

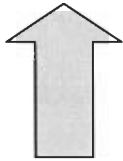
It's great to see a company buying its stock back. This shows that the company believes in itself. A stock buyback reduces the number of shares outstanding, which increases demand and should increase the share price eventually. We would like to see a yes in this column on our stock work sheets.



EPS Rank

A company's earning per share (EPS) drives just about everything related to stock. EPS rank looks at company's earning record and compares it to the earnings record of all other companies to see how the company stacks up. It's a quick way to see which companies are earning machines and which are earning accidents. *Investor's Business daily* ranks the stock on a scale of 1 to 99, with 99 being the best. Growth

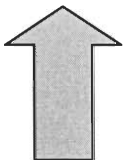
investors should insist on companies that have an EPS rank of 85 or better. Value investors have no requirement for this measurement because they'll accept lower earnings if it is a bargain stock with a chance of recovery.



Growth investors: (EPS) rating of 85 or better. Value investors: has no preference.

RPS Rank

Relative Price Strength (RPS) looks at the stock's price performance in the last 12 months. It doesn't look at stories, earnings, or price ratios. It simply reports the hard numbers and shows how the stock performed compared to other stocks. *Investor's Business Daily* ranks the stocks on a scale from 1 to 99, with 99 being the best. Our strategy for growth investors should restrict themselves to a rank of 80 or better. Value investors have no requirement because it would preclude bargain companies.



Growth investing: (RPS) of 80 or better. Value: no preference.

STARS Fair Value

Standard & Poor's uses its STARS system to predict a stock's potential over the next 12 months. STARS stands for Stock Appreciation Ranking System. It classifies

stocks from 1 to 5 with 5 being the best. Fair value is a rank of the stock's recent trading price compared to what S&P considers its fair value. These means stocks with a rank of 5 are the most undervalued-bargains and stocks with a fair value rank of 1 are overvalued. Look for S&P rankings of 4 or 5.

Volume Traded

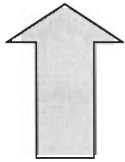
The amount of Stock traded on a given day. This is important because the stock market is greatly affected by supply and demand. If everyone wants to buy a certain stock, its price will rise. When the stock price shoots up or down 5% or more on a given day, the volume traded on that day usually increases. Some investors like to buy stocks with low volume, hoping the major institutions will discover them and begin trading heavily, causing the price to rise. Our strategy is not to get too liquid; our goal is to buy stocks that have at least a minimum volume of 50,000 trades a day.



Return on Equity

Return on Equity shows an investor how much a company has earned with the money people have invested in it. Simply divide net income by total shareholders'

equity. For example, if a company reports net income of \$8 million and total shareholders' equity of \$40 million, its return on equity is 20% ($\$8 \text{ million} / \$40 \text{ million} = 0.2$ or 20%). We are looking for 20% return on equity. Of course, bigger is better.



Look for at least 20% return.

2.6 - 100 % Movers Strategy



We decided to use this method after a couple of weeks into our stock market simulation. We were frustrated after purchasing the first five stocks. It seemed that as soon as we purchased a stock the price of that stock would decline. The market as a whole did not perform very well at the time we ran our simulation; all three major indexes were down (DOW, S&P500, NASDAQ). We decided to use another strategy that we called the 100% Movers Strategy. Here, we found companies that have had increasing stock prices over the past year and show no signs of slowing down. Most of the companies that comprise our list are smaller companies with a market-cap usually less than \$2 billion. Investing in smaller companies is riskier than investing in larger companies. Small companies can go bankrupt easier than larger companies. However, when using this strategy we prefer smaller companies as we are hoping to catch an upward momentum move from the company's growth.

9.1 % increase. As you can see if an investor invested \$1 dollar two years ago would have a return of \$4,484 on that \$1 investment, not bad at all! The only bad thing about this trade is the 5-year trend had a good size dip in its stock price, but with such an aggressive growth over the past 2-years it would almost be foolish to ignore the potential of making money on this trade.

Chapter 3 - Options

3.1 - Introduction to Stock Options

There are many advantages in option trading. When trading options, an investor has more leverage than when purchasing regular stocks. For example, option traders can easily double their investments with a small amount of money. Achieving similar results is much more difficult when trading regular stocks. The down side of option trading is the possibility that the investor can lose his or her investment practically overnight. We researched and explored many different option strategies, but decided to use just the basics in option trading. In this project, we only used a straightforward method known as buying “calls”.

There are several variables that must be taken into account when trading options. There are two different price listings; one is called a *Bid price* while the other is called an *Ask price*. The *Ask price* is how much the seller is asking for an option. The *Bid price* is how much the buyer is willing to pay for a particular option. The difference between the *Bid* and *Ask* prices can vary from as little as 0% to as high as 40%. On average, the *Ask price* ranges from 5% to 15% more than the *Bid price*. We decided to buy and sell at the *Ask price* to keep the calculations as simple as possible.

3.2 - Option Terminology

As we began studying option trading it became clear to us that we needed to include some basic option terminology in our report. Some commonly used option terminology is described below.

At-the-money - An option is at-the-money if the strike price of the option is equal to the market price of the underlying security.

Call – A call is an option contract that gives the holder the right to buy the underlying security at a specified price for a certain, fixed period of time.

Exercise - To implement the right under which the holder of an option is entitled to buy (in the case of a call) or sell (in the case of a put) the underlying security.

Exercise price – also known as the strike price. The strike price is the dollar value at which an investor purchases a security.

Expiration date – The last day on which an option can be exercised or it will cease to exist.

Expiration time - The time of day by which all exercise notices must be received on the expiration date.

In-the-money - A call option is considered in-the-money if the strike price is less than the market price of the underlying security. A put option is considered in-the-money if the strike price is greater than the market price of the underlying security.

Intrinsic value – The amount that an option is in-the-money.

Out-of-the-money - A call option is out-of-the-money if the strike price is greater than the market price of the underlying security. A put option is out-of-the-money if the strike price is less than the market price of the underlying security.

Premium - The price of an option contract, which the buyer of the option pays to the option writer for the rights conveyed by the option contract.

Put - An option contract that gives the holder the right to sell the underlying security at a specified price for a certain fixed period of time.

Strike price - The stated price per share for which the underlying security may be purchased (in the case of a call) or sold (in the case of a put) by the option holder upon exercise of the option contract.

Time value - The portion of the option premium that is attributable to the amount of time remaining until the expiration of the option contract. Time value is whatever value the option has in addition to its intrinsic value.

Underlying security - The security subject to being purchased or sold upon exercise of the option contract.

Volatility - A measure of the fluctuation in the market price of the underlying security. Mathematically, volatility is the annualized standard deviation of returns.

3.3 - What are options

An equity or stock option is a negotiable contract in which the seller gives the buyer the option to demand within a specified time the purchase (call) or sale (put) of a specified number of stocks at a fixed rate known as the strike price. The option buyer pays a premium to lock in the price of the underlying investment. The advantage of this type of investing is that an investor can leverage the small cost of the premium into a large profit.

For example, suppose that Intel stock is currently trading at \$40, but the investor believes that Intel's value is going to increase in a few months. The investor could purchase 1 option contract (1 contract = 100 shares) of Intel with a 6-month window to sell it by, at a strike price of \$50. The investor would pay a premium, perhaps \$500, for the right to buy the stock at \$50 within the next 6 months.

If the price of the stock goes above the strike price of \$50 within the next 6 months, the investor can sell the contract and make a profit (minus the \$500 premium). If the price of the stock does not go above the strike price within the 6-month time period,

the investor is not required to buy the underlying stock; the investor can let it expire. But in this case, the investor would lose the \$500 premium.

3.4 - Writing options

The option trading process begins when someone writes an option contract. The process of "writing" options explains somewhat the source of options, since neither the company behind the stock nor the options exchange issue options. There are two types of option contracts, calls and puts. If you have written a call, you have the obligation to sell shares at the strike price any time before the expiration date, if you get called. If you have written a put, you have the obligation to buy shares at the strike price any time before the expiration date, if you get assigned. If you have written a call (or put), and its owner has not yet exercised the option, you are said to be "short a call (or put)." We did not write any options in our simulation.

3.5 - Selling options

Selling an option is one of the three choices that an option investor has. After purchasing an option contract, the investor can sell the option contract only if he or she can find another buyer. After the investor has sold the option contract to a new buyer, the investor has no more obligations to that contract. It is important to note how important volume is while trading options. There can be as little as no trades to as many as 1 billion transactions on any given day of trading. For smaller companies, it's possible that there

will be no volume for weeks at a particular option strike price. If an investor buys an option contract with low volume, the investor might not be able to sell the contract later. In our project we assumed that there were investors willing to buy our option contracts when we decided to sell them.

3.6 - Exercising options

The second choice in option trading is to exercise your right as an option trader to purchase the underlying security at the strike price. For example, imagine that Intel was trading at \$40 and an investor bought one contract at a \$50 strike price, paying a premium of \$500. If Intel soared to a \$70 in the next month, the investor could exercise the option contract. Then the original writer of the contract must sell the underlying security at a \$50 strike price for a total sum of \$5,000 ($\$50 \text{ strike price} \times 100 \text{ shares} = \$5,000$). The new owner of the 100 shares of Intel stock can now make a profit if he or she decides to sell the 100 shares at the current market value of \$70 ($\$70 \text{ current market value} \times 100 \text{ shares} = \$7,000$). The total profit this investor would have made is \$1,500 ($\$7,000 - \$5,000 - \$500 = \$1,500$). The investor would have tripled his or her original investment on a 40% increase in stock price.

3.7 - Expiring options

An option contract expires when the time period of the option contract is up. An option contract will automatically expire if the investor does not take any action to sell or

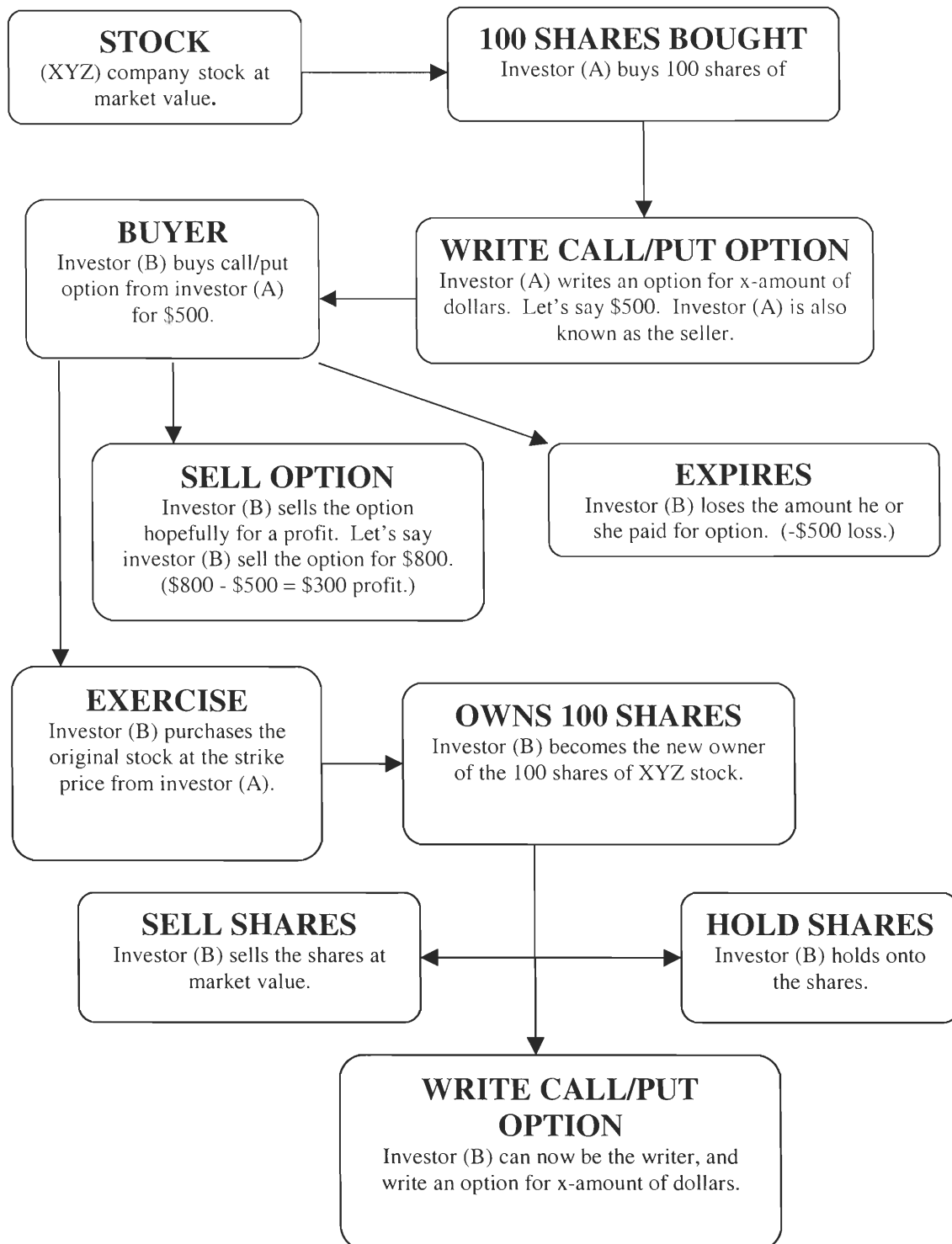
exercise the option contract by the end of the contract time period. If the stock price has dropped during the contract time period then it would not be wise to let the option contract expire. Even though the investor would be selling the option contract at a loss, this is better than losing all the original investment. For example, an investor paid a sum of \$500 for a 3-month option contract at a \$45 strike price. The stock is currently trading at \$40 and the investor hopes that it will surpass the \$45 strike price, but the stock's value never increases. If the investor does not act by the end of the 3-month time period then the option contract will automatically expire, and the investor would lose the entire \$500 premium. The investor should probably sell the option contract at a loss before the option expires and the investor suffers a 100% loss.

3.8 – Summarizing Option Trading

To summarize, an option trade begins when someone writes an option contract and sells it. After the buyer purchases the option contract from the writer, the buyer has three choices. First, the buyer can sell the option contract. Second, the buyer can exercise the option contract. Third, the buyer can let the option contract expire.

If the buyer decides to sell the option, then he or she would make a profit assuming that the market price has been reached or surpass the strike price before the expiration date. The original writer would then have contractual obligations to the new option holder. If the buyer decides to exercise the option contract, the buyer would purchase the underlying security at the strike price. Finally, the buyer can let the option contract expire, salvaging none of his or her original investment.

3.9 – Option Flowchart



Chapter 4 -

Mathematical Tools for Stock Picking

4.1 – Introduction

We researched mathematical tools for this project in an effort to find some innovative techniques that are not used by a typical investor. We found a mathematical computation tool engineered by Donald Fishback. This tool uses four mathematical equations to help predict a stocks performance. These equations are intended to be use by option traders, but are also applicable to regular stock trades. The mathematical concept is heavily based on volatility. The more volatile a stock is, the bigger the range of possibilities that the mathematical computation will compute.

We decided not to use these equations to decide which stocks we would invest in. These equations are solely based upon the past performance of the stock price. They do not take into account other factors, like when a company reports earnings that will not meet their projected estimates. There are many other factors that these equations do not take into account. These equations were only used after the transactions were completed, to see how accurate the mathematical computations could predict the stocks' performance.

There are two different types of calculations that the mathematical tool will compute. One calculation is called **“forecasting the size of a move based on volatility.”** This calculation predicts the size of a stock price move over a period of time, based on the past volatility of the stock. In other words, it gives a prediction of how high or low a stock price will move over a period of time. For example, Intel was trading at \$50 and an investor wanted to know how much Intel could rise or fall over a 5-week period. Based on the past volatility, the equation gave a prediction of both ends of the spectrum. They predicted that Intel could reach as high as \$60 or as low as \$40 during the 5-week time period. Armed with this information, the investor can make better-informed decisions regarding this particular trade.

The second calculation, called **“Calculating the Probability that a target price will and will not be achieved,”** determines the probability that a stock price will reach a certain high and low. For example, an investor that bought Intel at \$50 might want to know the probability that Intel’s price will increase to \$55 within a month. The mathematical tool can give the investor a probability that a price will and will not be achieved. Perhaps the tool predicts a 48 % and 52% chance that a \$55 target price will and will not be achieved in a one-month time. With a 52 % chance that Intel will not reach \$55 in a month, the investor might decide not to purchase Intel. By using both methods: forecasting the size of a move and the probability of that move, the investor can weigh the risk and rewards of a trade.

Our goal for this portion of the project is to see how accurate the mathematical tools are at predicting a stock price move over a period of time. As stated earlier, we use

this mathematical tool method only after the transactions are completed. We will not use this method to help us choose any stocks.

4.2 – Forecasting the Size of a Move Based on Volatility

Forecasting the size of a move based on volatility calculates a predicted range that a stock price will be between. Based on the data from that calculation we would then weigh our risk and reward of a potential trade. For example, if a stock is trading at \$20 and the calculation predicted that the range would be between a \$22 high and an \$18 low, that investment might not be worth the trade. The risk and reward of the trade would only be worth $\pm 9\%$. If a predicted range was between a \$30 high and a \$10 low, there is a possibility that the investor might lose big, but at the same time the reward might be worth the risk.

Forecasting the size of a move based on volatility has five different variables that are used in the calculation. The five variables are, one, the *number of days* that a trade will last; two, time, the number of days of a trade divided by 365 days in a year; three, volatility; four, the current stock price; and five, ± 1 standard deviations.

The first four variables are pretty straightforward. For the *number of days*, we used Donald Fishback's recommended 20 days of data to generate the volatility. *Time* is just a calculation. *Volatility* is also a calculation that simply shows how volatile a stock was during the past 20 days. The *current stock price* is the value of a stock the day before it was purchased. In our calculations we will be using the closing price of a stock the day before it was purchased.

The fifth variable, ± 1 standard deviation, requires a more in-depth explanation.

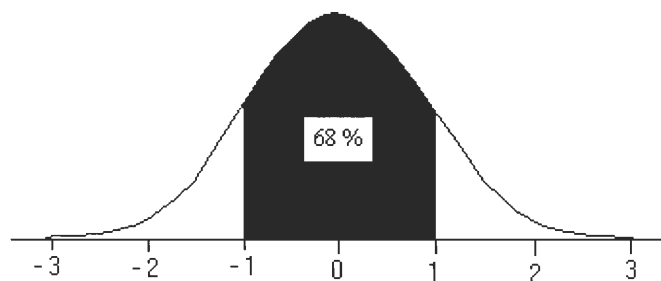
One might ask why only ± 1 standard deviation is used and not two or three standard deviations. Before we answer this question it is imperative that we first explain the

Empirical Rule. The Empirical Rule states:

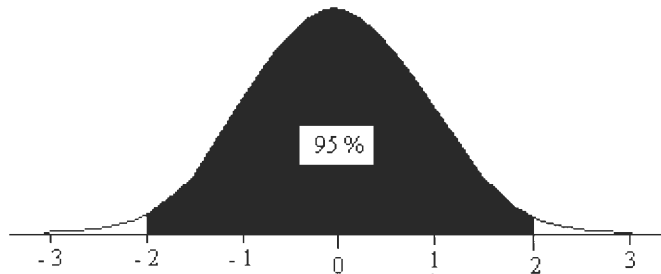
If a variable is normally distributed, then within one standard deviation of the mean there will be approximately 68% of the data. Within two standard deviations of the mean there will be approximately 95% of the data, and within three standard deviations of the mean there will be approximately 99.7% of the data. This rule applies to a normal bell-shaped distribution.

We used ± 1 standard deviation. It's a more realistic value than using two or three standard deviations because there are very few companies that double in size in a nine-week period. When ± 1 standard deviation is being used, there is a two-thirds probability that all possible outcomes will lie within that range, and a one-third probability that all possible outcomes will not lie in that range. By using the bell-shape curve, we can visualize the outcome in a shaded area.

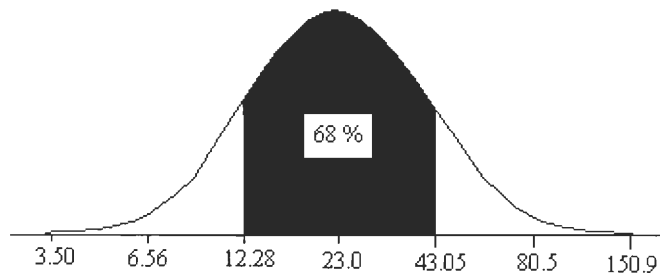
This graph represents ± 1 standard deviation of all possible movement, which is 68% of the shaded area underneath the bell-shaped curve.



This next graph represents ± 2 standard deviation of all possible movement, which is 95% of the shaded area underneath the bell-shape curve.



Let's look at an example and explain how someone should read a Bell Shape graph. For example, let's say over the past 20 trading days, Intel's price has gone up and down from \$16 to \$24. The day before Intel was purchased it was trading at \$23. Using the mathematical tools, we would forecast the stock price movement over a certain time period. This is our result:



- \$23 represents the price the day before Intel was purchased.
- \$12.28 and \$43.05 represent 68% of all possible price movement based on ± 1 standard deviation and this shown in the graph as the shaded area.
- \$12.28 and \$80.50 represent 95% of all possible price movement based on ± 2 standard deviations.

- \$3.50 and \$150.90 represent 99.7% of all possible price movement based on ± 3 standard deviations.

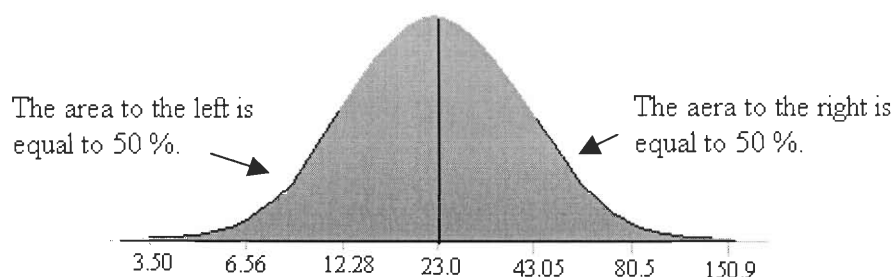
4.3 – Calculating the Probability of a Future Stock Price

After finding the predicted range of a stock price, the mathematical tool computes the probability of the stock price reaching another stock price known as the *target price*. For example, if Intel were trading at \$20 per share, an investor might want to know the probability that Intel would reach a *target price* of \$25 per share during a one-month time period. Using the mathematical tool, an investor can find the probability that a *target price* will be achieved.

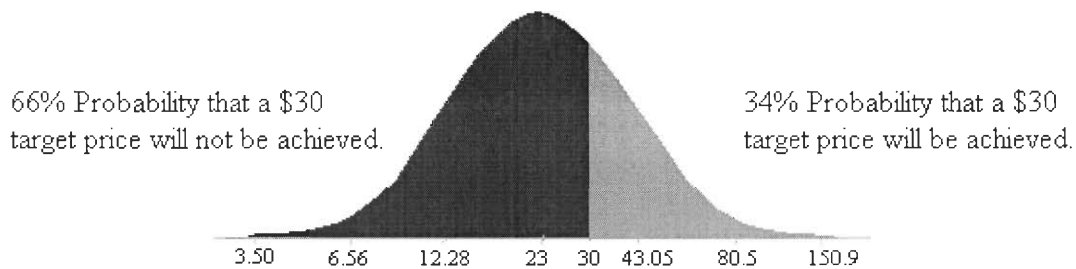
There are five different factors that are combined to help compute the probability. The five factors are, one, *Number of days*; two, *time probability*; three, *target price*; four, *volatility*; and five, *probability*. The first variable used to compute the probability is *number of days*. Our simulation is only nine-weeks long so we will use a maximum of 63 days. Don Fishback states in his video and book, that an investor should not use outrageous numbers of days in both this section and when computing the forecast and probability of a price movement. This is because the smaller the data collection the clearer the picture is. With a small collection of data, an investor is able to see a clearer and truer view of volatility. We will use one day in our calculations if we decide to buy and sell a stock overnight, just to see how accurate the mathematical tool can be. *Time Probability* is the square root of the *number of days* that we will use on a given stock divided by 365 days in a year. *Target price* is a price that an investor chooses and hopes

that the stock price will reach. In our project we used the final stock price as our target price because we wanted to know how accurate the mathematical tool would predict the actual price. *Volatility* is a calculation of how volatile a stock has been over the past 20 trading days.

Probability is the percentage that a stock price will and will not be achieved. It is important to note that when calculating the probability of a stock price that is greater than its current stock price, the mathematical formulation will not predict a percentage more than 49.999%. However, if we were going to pick a target price less than the current trading price, the mathematical tool could formulate a percentage as high as 100%. Examine this next graph, which is from the previous section. Here, \$23 is the current trading price. \$43.05 and \$12.28 is the ± 1 standard deviation of the current stock price in a given time period.

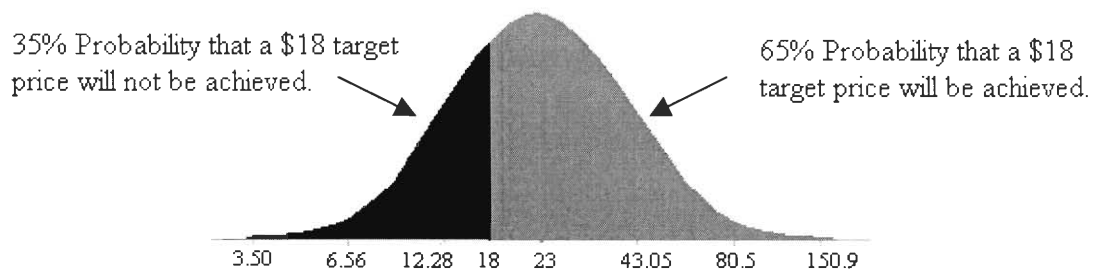


The shaded area underneath the bell curve equals one. Below is shown what the graph would look like if the target price were \$30, instead of \$23.



When the target price is greater than the current price, the probability of reaching that target price is going to be less than 50%. The greater the target price is, the smaller the probability that the target price will be achieved. If we used a target price of \$40 then results would be a 19% and 81% probability that a \$40 target price will and will not be achieved. If we used a \$50 target price the results would then be 11% and 89% that the \$50 target price will and will not be achieved.

If we choose a target price lower than the current stock price. The mathematical tool will compute a probability up to 100%. Let's use the above example again which is from the previous section. If we use a target price of \$18 our results would be 65% and



35% probability that an \$18 target price will and will not be achieved.

To summarize, this computation finds the probability of a future stock price, based on the stock's recent performance. If the target price is more than the current price, the highest probability that this mathematical tool will compute is 49.9999%. If we were going to purchase a stock and our computation calculated a 44% probability that our target price would be achieved, that 44% out of a possible of 49.9999% would seem to indicate a good purchase.

4.4 – Equation References

Equation 1 – Solves for Standard Deviations that a future price is from the current price.

Where X = future price, S = current price, σ = volatility, $T = \sqrt{(\text{days} / 365)}$

$$X = \frac{\text{Log} (X / S)}{\sigma * T}$$

Equation 2 – Normal Density Function – Solves for area under the curve - ∞ and x.

Since the curve is symmetrical, we can solve for the area when x is negative by taking the absolute value of x, perform the calculation as shown, and then subtract the result from 1.

$$\text{Area} = 1 - (1 / \sqrt{(2 * \pi)}) e^{-x^2 / 2} (b_1 t + b_2 * t^2 + b_3 * t^3 + b_4 * t^4 + b_5 * t^5)$$

Where $t = 1 / (1 + px)$ and x = any positive standard deviation. Since the curve is symmetrical, we can solve for the area when x is negative by taking the absolute value of x , and then subtract the result from 1. Microsoft Excel computes this equation using the function =NORMDIST.

Equation 3 – Bell curve formula – Solves for Y value of the Normal Distribution Curve.

$$Y = 1 / \sqrt{(2 * \pi)} * e^{-x^2 / 2}, \text{ Where } x = \text{standard deviation}$$

Equation 4 – Solves for the future price that is “x” standard deviation from the current price.

$$X = e^{\sigma * t * x} * S$$

Where S = current price, σ = volatility, $t = \sqrt{(\text{days}/365)}$, x = standard deviation.

4.5 – Explaining the Formula Step by Step

We will now discuss how the mathematical tools are formulated. We used Microsoft Excel software to calculate the formulations. Step by step, we will explain each row and column of the Excel spreadsheet. With the following information, the reader should be able to follow along with the formulation by using one of formulated work sheets found in chapter five. The formula is divided into three sections. In the first section, the actual data is collected and computed into volatility. In the second section, the formulation forecasts the size of a stock price move based on volatility. In the final section, the formulation calculates the probability of a stock price move.

Section one is titled **Data collection and calculating the volatility of (x) standard deviation**. One must fill out the Excel worksheet using the following instructions to use the mathematical tool. In the first column, called Date, record the past 20 trading days before the date of purchase. In the second column, Daily Price, the daily stock price is recorded over the past 20 trading days. In the third column, titled Price/Previous Price, simply divide the daily stock price by the previous daily stock price. This can be accomplished by using the Microsoft Excel function **=SUM(B5/B4)** in each row, where B represents the second column of values and 5 and 4 represent the row of each value. There is no value in the first row of this column because zero divided by some number is undefined. In the fourth column, Log of Daily Price Change, the daily logarithmic price change is calculated. The (log) of each value in column three is calculated by using the Microsoft Excel function **=LN(C5)** in each row. In the fifth column, the standard deviation is calculated by using the function **=STDEV(D5:D23)**.

This function produces a standard deviation for all the values from column three, where D represents the values in column three. In the sixth column, the volatility is calculated based on the (x) standard deviation. Volatility has a slightly different definition for this measurement. Here, volatility is defined as one standard deviation of the daily logarithmic price change, annualized. The volatility is calculated by using the function **=SUM(E23*SQRT(365))**, where E23 represents the standard deviation in column five and the 365 in this function, represents the number of days in a year (annualized).

In section two we are **“Forecasting the Size of a Move Based on Volatility”**.

This section predicts a range of a stock price move over a certain time period. The Excel spreadsheet is defined using the following instructions. In the first row, # of Days 1, input the number of days that the stock or option is held onto. In the second row, the time is being calculated. The time value is simply the number of days into the future that we are looking. The function **=SQRT(B25/365)** calculates time as a fraction over one year squared. B25 represents the [# of Days 1] of a transaction and 365 represents the number of days in a year. In the third row, sigma is similar to the volatility that is calculated in the previous section. The function that is used to calculate sigma is **=SUM(E23*SQRT(365))**. In the fourth row, we use +1 standard deviation for all [(x) + Standard Deviation)] transactions. In the fifth row, we use -1 for all [(x) - Standard Deviation] transactions. In the sixth row, Current Price, we enter the last traded stock price before the purchase. In the seventh row, calculating the forecast of a positive stock price move is called [(x) Forecasting + Move]. This projects how high a stock price will be in one year by using the function **=EXP(B26*B27*B28)*B30**. EXP represents the exponent and B26, B27, B28, and B30 represents Time, Sigma, (x) + Standard Deviation,

and Current Price respectively. In the eighth row, the forecast of a negative stock price move [(x) Forecasting – Move] is calculated. This predicts how low a stock price will be in one year by using almost the same function as the positive move except now the calculation is using the negative standard deviation. The Excel function that is used is **=EXP(B26*B27*B29)*B30**. The only difference between this function and the previous one is that this function is calculating B29 instead of B28. B29 represents negative standard deviation in the calculation.

The third and final section is **Calculating the Probability that a Target Price Will and Will not be Achieved**. The Excel spreadsheet is defined using the following instructions. In the first row, [# of Days 2] represents the number of days into the future an investor is looking. This value does not have to be the same as [# of Days 1] that was entered in section two of this formulation. In the second row, Time Probability is being calculated. This value is the number of days that we are looking into the future. It is calculated by using the function **=SQRT(B34/365)**. This will calculate time as a fraction in one year squared. B34 represents the [# of Days 2] of a transaction and 365 represents the number of days in a year. In the third row, Target Price is the projected future price. In the fourth row, Volatility is a measure of the fluctuation in a stock price. It is calculated by using the function **=LN(B36/B23)/(B27*B35)**, where LN, B36, B23, B27, and B35 represent Log, Target Price, Current Price, Sigma, and Time Probability. In the fifth row, [Probability % will not hit Target Price] the formula calculates the percentage that a target price will not be achieved over a certain time period. This is calculated by using the function **=NORMSDIST(B37)**, where NORMSDIST represents polynomial approximation and B37 represents the volatility of the stock.. This is a lengthy

calculation if it is done by hand. In the sixth row, [Probability % will hit Target Price] represents the percentage that a stock price will achieve its target price over a certain time period. This is calculated by using the function $=SUM(1-B38)$, where B38 represents the polynomial approximation ($NORMSDIST(B37)$) that was calculated in the previous row.

Chapter 5 - Company Information and Transactions

5.1 – Purchased Stocks

The following is an in depth description of each stock that we purchased during our simulation. For each stock, we introduce and describe the company, then explain why we decided to purchase that particular stock. We then provide an indicator work sheet and a price graph that shows how our stocks performed from day to day. We also provide a mathematical formulation that attempts to compute the future forecasts of a stock price and the probability that a certain target price will be met. Finally, we attempt to draw some related conclusions.

5.1.1 - Cisco Systems (CSCO)

Cisco Systems provides Internet networking solutions for individuals, companies, universities, and government agencies worldwide. Networking solutions connect computing devices and computer networks, allowing people to access or transfer information without regard to time, place, or type of computer system. These solutions are provided in the form of hardware, software, and services. Cisco customers receive a competitive advantage through a more efficient and timely exchange of information.

This advantage leads to cost savings, efficiency, and closer relationships with customers, prospects, business partners, suppliers and employees.

Cisco Systems, along with Intel, was the first stock that we purchased. We looked at Cisco because of its' reputation as a strong company. In the 1990's they had seven 2-for-1 splits and two 3-for-2 splits. Before investing in Cisco, we examined the company's stock indicators. The company had a high net profit margin (21.3%) and **no debt**. The sales/revenue, earnings, and cash flow per share were all on an upward trend for the past five years. Cisco had a high-projected sales and earnings and a good quick ratio of .91. The only somewhat negative indicators were the current ratio of 1.78, P/E ratio and P/S Ratio. The overwhelmingly positive stock indicators finalized our decision to purchase this stock.

On September 18, 2000, we purchased 162 shares of Cisco at \$61.56 per share for a total investment of \$9,972.72. Initially, the stock price rose for a few days until September 20th, but it soon dropped down into the 50s and never came back to its original purchase price. We held the stock until the simulation ended on November 17th, when we finally sold the stock at \$52.75 per share. Our final result was a loss of \$1,427.22, which represents a 14.3% loss.

We thought Cisco would be a good investment but instead we took a huge loss. One explanation for the company's loss in value is that the entire technology sector took a hit. Additionally, on September 28, Standford Bernstein, an analyst group, downgraded Cisco Systems.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought Cisco

it was trading at \$62.80 per share. Our target price was \$52.75, which was the actual stock price when we decided to sell it on November 17th. The size of move based on volatility forecast yielded a range of \$50.55 to \$78.02. The actual result, \$52.75, came in on the low end of the range. The formula calculated that the probability that the target price would be achieved was 79%.

Cisco (CSCO) Stock Indicators

Primary Indicators

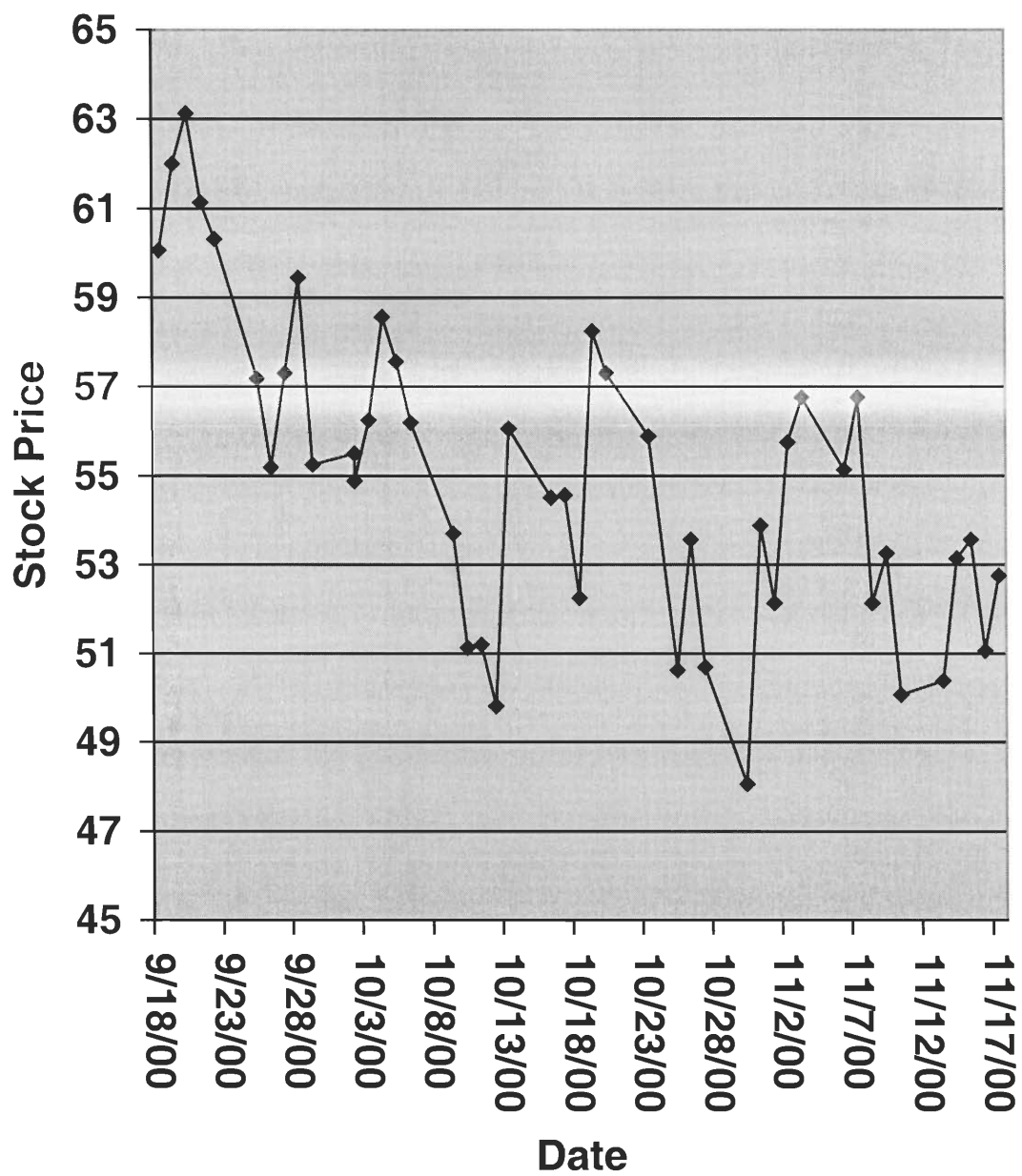
| | |
|----------------------------------|---------------------|
| Net Profit: | 21.3% |
| Cash: | \$4.654 billion |
| Total Debt: | none |
| Sales/Revenue per Share: | 2.65 (upward trend) |
| Cash Flow per Share: | .65 (upward trend) |
| Earnings per Share (EPS): | .53 (upward trend) |
| Current Ratio: | 1.78 |
| Quick Ratio: | .91 |
| 5-Year Sales Gain: | 54.0% |
| 5-Year Earnings Gain: | 49.0% |
| Projected Sales: | 31.5% |
| Projected Earnings: | 39.5% |

Secondary Indicators

| | |
|---|---------------------------|
| Market Capital: | \$450 billion |
| 52wk High/Low: | 81.75 / 32.5 |
| Sales: | \$18.4 billion |
| Dividend Yield: | N/A |
| Insider Buy/Own: | officers/directors own 2% |
| 5-Year Price Appreciation: | $(60/5 - 1) = 1100\%$ |
| Projected High/Low: | 100/65 |
| Timeliness/Safety: | 2/3 |
| Current Price to Earnings (P/E): | 120 |
| Average Price to Earnings: | 36.42 |
| Price to Sales (P/S): | 22.6 |
| Price to Book (P/B): | 3.00 |
| Max/Min: | +55%/0% |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad.

Cisco Chart



• Cisco System Mathematical Computation

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|---------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| 8/18/00 | 63.5 | | | | |
| 8/21/00 | 65.5 | 1.031496063 | 0.031010237 | | |
| 8/22/00 | 64.8 | 0.989312977 | -0.010744539 | | |
| 8/23/00 | 67.2 | 1.037037037 | 0.036367644 | | |
| 8/24/00 | 66.5 | 0.989583333 | -0.0104713 | | |
| 8/25/00 | 66.5 | 1 | 0 | | |
| 8/28/00 | 66.1 | 0.993984962 | -0.006033201 | | |
| 8/29/00 | 66.6 | 1.007564297 | 0.007535831 | | |
| 8/30/00 | 66.6 | 1 | 0 | | |
| 8/31/00 | 68.6 | 1.03003003 | 0.029587957 | | |
| 9/1/00 | 68.6 | 1 | 0 | | |
| 9/5/00 | 66 | 0.962099125 | -0.038637793 | | |
| 9/6/00 | 64.3 | 0.974242424 | -0.026095111 | | |
| 9/7/00 | 66.3 | 1.031104199 | 0.030630266 | | |
| 9/8/00 | 63.9 | 0.963800905 | -0.036870536 | | |
| 9/11/00 | 61.2 | 0.957746479 | -0.043172172 | | |
| 9/12/00 | 58.9 | 0.962418301 | -0.038306099 | | |
| 9/13/00 | 61.3 | 1.040747029 | 0.039938752 | | |
| 9/14/00 | 61.3 | 1 | 0 | | |
| 9/15/00 | 62.8 | 1.024469821 | 0.024175231 | 0.02733915 | 52% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 63 |
| Time = | 0.41545486 |
| Sigma = | 0.5223137 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 62.8 |
| ((x) Forecasting + Move) = | 78.01 |
| ((x) Forecasting - Move) = | 50.54 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 63 |
| Time Probability = | 0.41545486 |
| Target Price = | 52.75 |
| Volatility = | -0.8036548 |
| Probability % will not hit Target Price | 21% |
| Probability % will hit Target Price | 79% |

*

5.1.2 - Intel Corporation (INTC)

The Intel Corporation produces semiconductor chips, microprocessors, chipsets, flash memory products, networking and communications products, embedded processors and micro-controllers, and PC-peripheral products. Intel supplies the computing and communications industries with chips, boards, systems, and software for computers, servers, and networking and communications products. Intel products are sold to original equipment manufacturers, PC users, industrial and communications equipment manufacturers, businesses, schools, and state and local governments. Intel also provides data center services to businesses involved in e-Commerce.

The Intel Corporation, along with Cisco, was the first stock that we purchased. We researched Intel because it was highly recommended by Leckey's "50 Best Stocks" book, and personal experience has shown that the company is well run. During the 1990's, Intel has had six 2-for-1 stock splits, indicating that the company is momentum mover. Intel was purchased on the basis of its' favorable stock indicators. Every primary indicator of Intel was positive except for a couple of 1998 trends, which had showed a slow down, but the semiconductor industry as a whole had a slight recession during that year. Intel has had a high profit margin, ten times more assets than debt, 25% sales and earnings gains, favorable current and quick ratios, and good projected sales and earnings. Intel also has had upward trends of sales/revenue, cash flow, and earnings per share. Based on our primary indicator strategy, purchasing Intel seemed like a "no-brainer."

On September 18, 2000, we purchased 171 shares at \$58.37 per share for a total investment of \$9,981.27. Shortly after our purchase, the stock price began plummeting

on September 20th. The primary cause for this sudden decrease in price was Intel's earnings warning announcement. We then felt that Intel was now an undervalued stock that would likely return to its' original price so we decided to buy a November call option on September 26th. We purchased 5 contracts for \$3.38 per share when the actual stock price was \$43.31. We invested a total of \$1,690 and our *strike price* was \$45. Intel's price never rose back to its original value during the course of our simulation. We held the stocks for 63 days and the November call option for 55 days until the simulation's end on November 17th. We finally sold the stock at \$41.50 per share and the option contracts at \$0.0625 per share. Our final results for both the stocks and the option contracts were losses of \$2,884.77 and \$1,658.75, representing losses of 28.9% and 98.2%, respectively.

Three major factors caused Intel to falter. First, over the summer Intel had problems meeting their customer demands, which caused their customers to go to other chipmakers like AMD. Then, Intel announced that they were not going to meet their 3rd quarterly earnings; in fact they were around \$600 million short. Intel later announced that they were not going to meet their 4th quarterly earnings, as well. These announcement not only hurt the Intel, they also affected the entire technology sector.

We made many mistakes with the option contracts. We had several opportunities to sell our contracts to make a little profit, but instead we held onto them in anticipation that Intel would make a comeback. The longer we held onto the contracts the more value they lost, until we finally sold the contracts for a measly \$0.0625 per share. We took a heavy loss of 98.2%. We learned a lot from this trade, most importantly not to hold onto

an option contract for too long because it's value will drop very quickly as the expiration date approaches.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought Intel it was trading at \$57.50 per share. Our target price was \$41.50, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$45.88 to \$72.06. The actual result, \$41.50, fell short of the predicted range. The formula calculated that the probability that the target price would be achieved was 93%.

We also used the mathematical tool to compute the same calculations for the option contracts. The last current price before we purchased the option contract was \$45.40. The actual price at time when we sold the option contract on November 17th was \$41.50, which is our target price. The size of move based on volatility forecast yielded a range of \$27.93 to \$73.78. The actual result, \$41.50 did stay within the predicted range. The formula calculated that the probability that the target price would be achieved was 57%

Intel Corporation (INTC) Stock Indicators

Primary Indicators

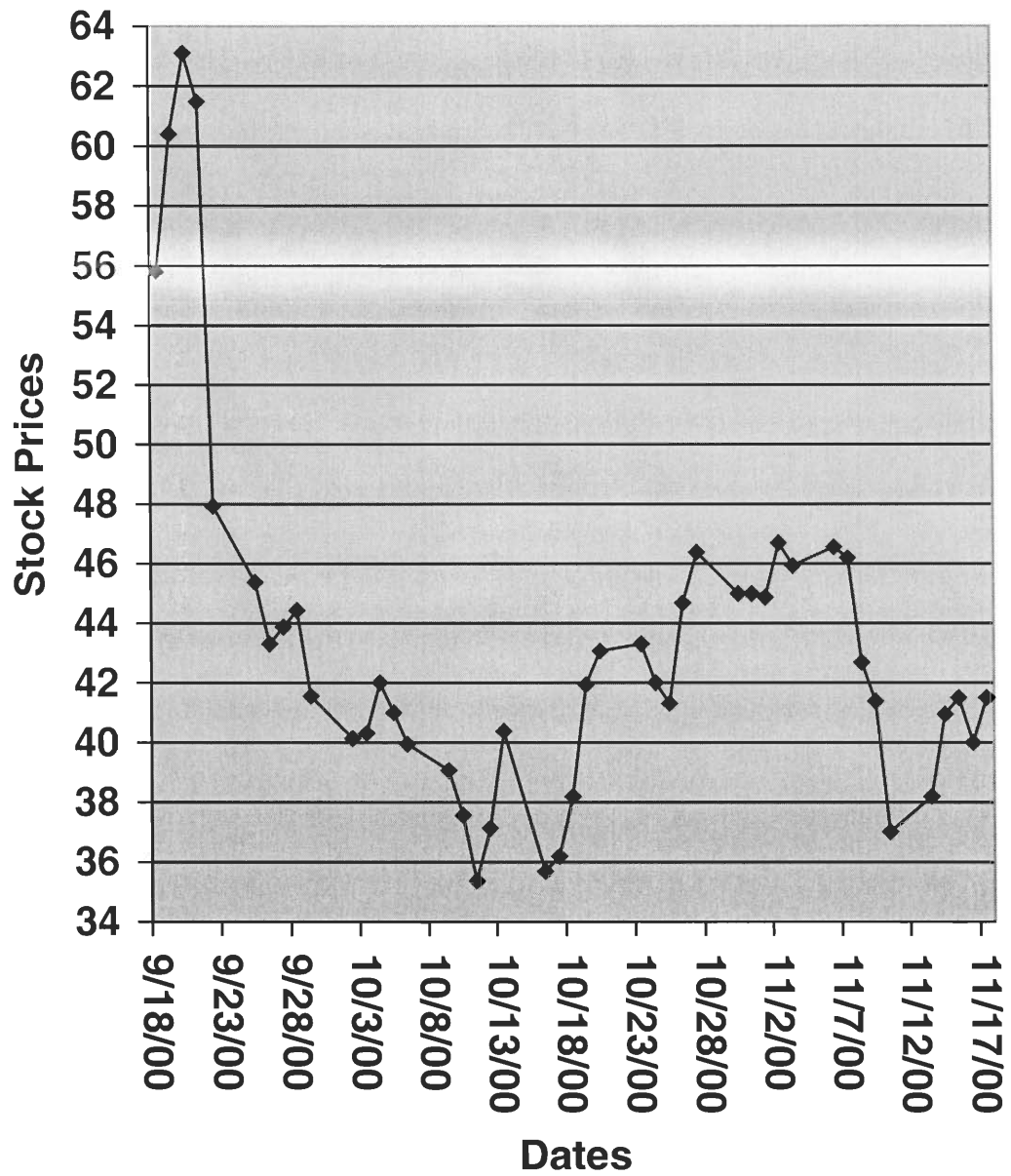
| | |
|----------------------------------|--|
| Net Profit: | 30.7% |
| Cash Assets: | \$10,759,000,000 |
| Total Debt: | \$1,241,000,000 |
| Sales/Revenue per Share: | 5.05 (trend up past 5, up next 2) |
| Cash Flow per Share: | 2.05 (trend up 4 out of 5 past, up next 2) |
| Earnings per Share (EPS): | 1.06 (trend up 4 out of 5 past, up next 2) |
| 5-Year Sales Gain: | 25.5% |
| 5-Year Earnings Gain: | 29% |
| Current Ratio: | 2.46 |
| Quick Ratio: | 1.52 |
| Projected Sales: | 13% |
| Projected Earnings: | 17.5% |

Secondary Indicators

| | |
|---|--|
| 52 Week High/Low: | \$75.8 / \$32.5 |
| Market Capital: | \$411,232,000,000 |
| Sales: | \$34,100,000 |
| 5-Year Price Appreciation: | 562% |
| Dividend Yield: | 0.2%, trend up past 5, trend up next 2 |
| Insider Buy/Sell/Own: | 0 / 31 / 6.3% |
| Projected High/Low: | \$110 & \$75 |
| Timeliness/Safety: | 2 & 3 |
| Current Price to Earnings (P/E): | 48.3 |
| Average Price to Earnings: | 20.5 |
| Price to Sales (P/S): | 12.46 |
| Price to Book (P/B): | 6.30 |
| Max/Min: | 55 % & 5 % |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

Intel Stock Chart



• Intel Mathematical Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|---------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| 8/18/00 | 70.6 | | | | |
| 8/21/00 | 72.1 | 1.021246459 | 0.0210239 | | |
| 8/22/00 | 72.1 | 1 | 0 | | |
| 8/23/00 | 74.6 | 1.034674064 | 0.034086463 | | |
| 8/24/00 | 74.3 | 0.995978552 | -0.004029555 | | |
| 8/25/00 | 72.9 | 0.98115747 | -0.019022313 | | |
| 8/28/00 | 73.9 | 1.013717421 | 0.013624189 | | |
| 8/29/00 | 74.1 | 1.00270636 | 0.002702704 | | |
| 8/30/00 | 73.5 | 0.991902834 | -0.008130126 | | |
| 8/31/00 | 74.9 | 1.019047619 | 0.018868484 | | |
| 9/1/00 | 73.9 | 0.986648865 | -0.013441063 | | |
| 9/5/00 | 69.3 | 0.937753721 | -0.064267922 | | |
| 9/6/00 | 65.7 | 0.948051948 | -0.053345981 | | |
| 9/7/00 | 67.4 | 1.02587519 | 0.025546092 | | |
| 9/8/00 | 65.4 | 0.970326409 | -0.030122759 | | |
| 9/11/00 | 64.7 | 0.989296636 | -0.010761057 | | |
| 9/12/00 | 64.9 | 1.00309119 | 0.003086422 | | |
| 9/13/00 | 61.3 | 0.944530046 | -0.057067781 | | |
| 9/14/00 | 59.6 | 0.972267537 | -0.028124269 | | |
| 9/15/00 | 57.5 | 0.964765101 | -0.035870626 | 0.02843748 | 54% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 63 |
| Time = | 0.41545486 |
| Sigma = | 0.5432972 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 57.5 |
| ((x) Forecasting + Move) = | 72.06 |
| ((x) Forecasting - Move) = | 45.88 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 63 |
| Time Probability = | 0.41545486 |
| Target Price = | 41.5 |
| Volatility = | -1.4447016 |
| Probability % will not hit Target Price | 7% |
| Probability % will hit Target Price | 93% |

• Intel Mathematical Option Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|---------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 8/28/00 | 73.9 | | | | |
| 8/29/00 | 74.1 | 1.00270636 | 0.002702704 | | |
| 8/30/00 | 73.5 | 0.991902834 | -0.008130126 | | |
| 8/31/00 | 74.9 | 1.019047619 | 0.018868484 | | |
| 9/1/00 | 73.9 | 0.986648865 | -0.013441063 | | |
| 9/5/00 | 69.3 | 0.937753721 | -0.064267922 | | |
| 9/6/00 | 65.7 | 0.948051948 | -0.053345981 | | |
| 9/7/00 | 67.4 | 1.02587519 | 0.025546092 | | |
| 9/8/00 | 65.4 | 0.970326409 | -0.030122759 | | |
| 9/11/00 | 64.7 | 0.989296636 | -0.010761057 | | |
| 9/12/00 | 64.9 | 1.00309119 | 0.003086422 | | |
| 9/13/00 | 61.3 | 0.944530046 | -0.057067781 | | |
| 9/14/00 | 59.6 | 0.972267537 | -0.028124269 | | |
| 9/15/00 | 57.5 | 0.964765101 | -0.035870626 | | |
| 9/18/00 | 55.8 | 0.970434783 | -0.030011078 | | |
| 9/19/00 | 60.4 | 1.082437276 | 0.079215236 | | |
| 9/20/00 | 63.1 | 1.044701987 | 0.043731665 | | |
| 9/21/00 | 61.5 | 0.974643423 | -0.025683595 | | |
| 9/22/00 | 47.9 | 0.778861789 | -0.24992167 | | |
| 9/25/00 | 45.4 | 0.947807933 | -0.053603399 | 0.06548752 | 125% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 55 |
| Time = | 0.38818157 |
| Sigma = | 1.2511374 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 45.4 |
| ((x) Forecasting + Move) = | 73.78 |
| ((x) Forecasting - Move) = | 27.93 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 55 |
| Time Probability = | 0.38818157 |
| Target Price = | 41.5 |
| Volatility = | -0.1849383 |
| Probability % will not hit Target Price | 43% |
| Probability % will hit Target Price | 57% |

5.1.3 -Wal-Mart Stores (WMT)

Wal-Mart Stores, Inc. principally is engaged in the operation of mass merchandising stores, which serve customers primarily through the operation of three segments. The Wal-Mart Stores segment includes the Company's discount stores and Super-centers in the United States. The SAM'S Club segment includes the warehouse membership clubs in the United States. The International segment includes all operations in Argentina, Brazil, Canada, China, Germany, Korea, Mexico, Puerto Rico and the United Kingdom.

With the Christmas Season on the horizon, we wanted to invest in a retail chain that would benefit from the increase in Christmas sales. Leckey's *50 Best Stocks* book suggested that Wal-Mart was such a company, and personal positive experiences with the franchise caused us to further research the company. Wal-Mart's stock price has almost always increased in value during previous Christmas seasons. In the 1990's the company had three 2-for-1 stock splits, indicating company growth. The stock indicators of Wal-Mart were mediocre at best. The company had a 3.5% net profit, a huge debt, and poor current and quick ratios. The cash flow and earnings per share were both trending downward during this past year, although in previous years the trend has been upward. The company did have some indicators that were good; the sales/revenue per share had been on a consistent upward trend, the 5-year sales and earnings gains were high, along with the projected sales and earnings. While the stock indicators were not that impressive, we decided to invest in Wal-Mart because of its solid historical trends during the months of October and December.

On September 16, 2000, we purchased 202 shares of Wal-Mart at \$49.44 per share for a total investment of \$9,986.88. After purchasing the stock, it's price immediately began a downward swing, dropping to 48, then 46, then 45, then 44, and even as low as \$43 per share in late October. The stock made an upward swing in November, and we sold it at a peak price of \$49 per share, two days before our simulation ended on November 15th. We held onto the stock for 53 days. Our final result was a negligible loss of \$88.88, which represents a 0.89% loss.

We were surprised that Wal-Mart didn't continue it's previous trend of rising in value during the Christmas season. One possible explanation for the stock's mediocre performance may be that two analyst groups, AG Edwards and DIJ, downgraded the stock on May 8th and August 15th, respectively. Also, there were reports about the U.S economy beginning to slow down, which may have had a direct effect on Christmas sales.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought Wal-Mart it was trading at \$49.40 per share. Our target price was \$49.00, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$41.90 to \$58.23. The actual result, \$49.00, fell right in the middle of the predicted range. The formula calculated that the probability that the target price would be achieved was 52%

Wal-Mart Stores (WMT)

Primary Indicators

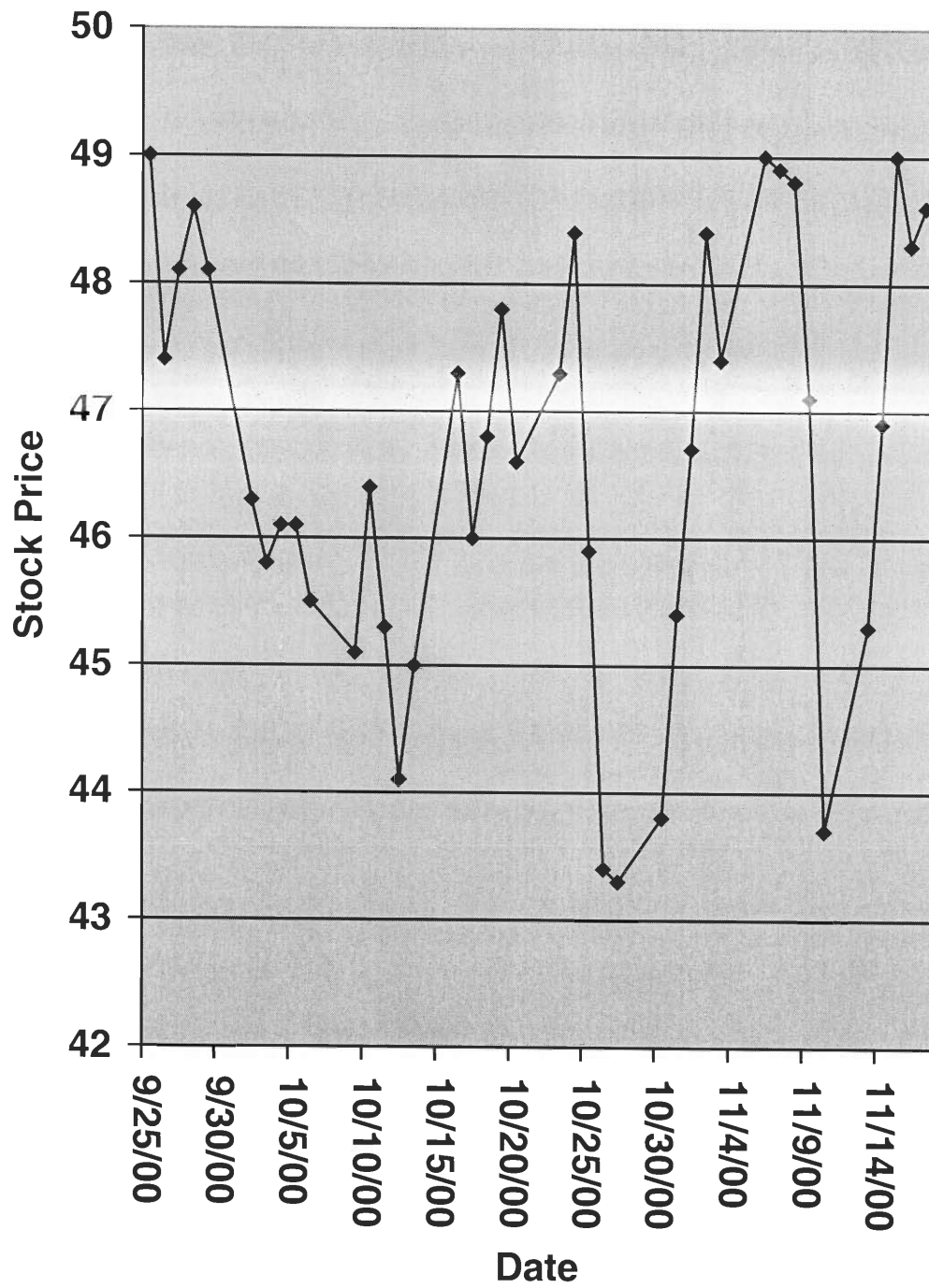
| | |
|----------------------------------|---|
| Net Profit: | 3.5% |
| Cash: | \$1.31 billion |
| Total Debt: | \$22.6billion |
| Sales/Revenue per Share: | 43.45 (upward trend) |
| Cash Flow per Share: | 2.15 (upward trend, down last year) |
| Earnings per Share (EPS): | 1.5 (up95, 96, 97 down 98, 99 up00, 01) |
| Current Ratio: | .944 |
| Quick Ratio: | .05 |
| 5-Year Sales Gain: | 16.0% |
| 5-Year Earnings Gain: | 15% |
| Projected Sales: | 16% |
| Projected Earnings: | 19.5% |

Secondary Indicators

| | |
|---|----------------------------|
| 52wk High/Low: | 70.25 / 43.5 |
| Market Capital: | \$236 billion |
| Sales: | \$193.3 billion |
| Dividend Yield: | .5 |
| Insider Buy/Own: | officers/directors own 40% |
| 5-Year Price Appreciation: | 255% |
| Projected High/Low: | 90/65 |
| Timeliness/Safety: | 3/2 |
| Current Price to Earnings (P/E): | 35.3 |
| Average Price to Earnings: | 26.2 |
| Price to Sales (P/S): | 1.62 |
| Price to Book (P/B): | 7 |
| Max/Min: | +70%/+25% |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

Wal-Mart Stock Price Chart



• Wal-Mart Mathematical Computation

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|---------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 8/25/00 | 50.5 | | | | |
| 8/28/00 | 49.5 | 0.98019802 | -0.020000667 | | |
| 8/29/00 | 49.4 | 0.997979798 | -0.002022245 | | |
| 8/30/00 | 48.4 | 0.979757085 | -0.02045061 | | |
| 8/31/00 | 47.6 | 0.983471074 | -0.016667052 | | |
| 9/1/00 | 48.8 | 1.025210084 | 0.024897552 | | |
| 9/5/00 | 49.8 | 1.020491803 | 0.020284671 | | |
| 9/6/00 | 50 | 1.004016064 | 0.004008021 | | |
| 9/7/00 | 51 | 1.02 | 0.019802627 | | |
| 9/8/00 | 52.1 | 1.021568627 | 0.021339316 | | |
| 9/11/00 | 54.4 | 1.044145873 | 0.043199205 | | |
| 9/12/00 | 54 | 0.992647059 | -0.007380107 | | |
| 9/13/00 | 53.9 | 0.998148148 | -0.001853569 | | |
| 9/14/00 | 52.5 | 0.974025974 | -0.026317308 | | |
| 9/15/00 | 51.1 | 0.973333333 | -0.027028672 | | |
| 9/18/00 | 49.9 | 0.976516634 | -0.023763494 | | |
| 9/19/00 | 48.5 | 0.971943888 | -0.028457205 | | |
| 9/20/00 | 50 | 1.030927835 | 0.030459207 | | |
| 9/21/00 | 50.5 | 1.01 | 0.009950331 | | |
| 9/22/00 | 49.4 | 0.978217822 | -0.022022912 | 0.02261152 | 43% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 53 |
| Time = | 0.38105837 |
| Sigma = | 0.4319926 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 49.4 |
| ((x) Forecasting + Move) = | 58.23 |
| ((x) Forecasting - Move) = | 41.90 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 53 |
| Time Probability = | 0.38105837 |
| Target Price = | 49 |
| Volatility = | -0.0493889 |
| Probability % will not hit Target Price | 48% |
| Probability % will hit Target Price | 52% |

5.1.4 - EMC Corporation (EMC)

EMC Corporation and its subsidiaries design, manufacture, market and support a wide range of hardware and software products and provide services for the storage, management, protection and sharing of electronic information. These integrated solutions enable organizations to create an electronic information infrastructure, or what EMC calls an E-Infostructure. EMC is the supplier of these solutions, which are comprised of enterprise storage systems, networks, software and services. Its products are sold to customers utilizing a variety of the world's most popular computing platforms for key applications, including electronic commerce, data warehousing and transaction processing.

We first examined EMC because of its reputation as a solid investment. After some research and assessment of the company's stock indicators, EMC seemed like an obvious purchase. In the 1990's it had six 2-for-1 stock splits and a 3-for-2 stock split, indicating that the company is a momentum mover. According to our stock indicator strategy, EMC rated excellent. Every primary indicator was positive and almost every secondary indicator was positive as well, the only exceptions being the insider sell/own, safety rating, current P/E and average P/E. The current P/E ratio was at 206, suggesting that EMC may be overvalued.

On September 26, 2000, we purchased 97 shares at \$102.25 per share for a total investment of \$9,918.25. The stock immediately began dropping in value. In retrospect we realized that we bought EMC at a peak price. We bought the stock at exactly the worst possible time. We held the stock for 52 days, finally selling it at the end of our

simulation on November 17th at \$84.88 per share. Our final result for this trade was a loss of \$1,684.89, which represents a 17% loss.

On October 4th, we bought two November call option contracts of EMC at \$9.50 per share. The actual stock price was trading at \$92.13 and our strike price was at \$90. We decided to buy these contracts because of a 9.9% drop in EMC's stock price over the past seven days. We believed that EMC would rebound back to over \$100 very quickly, but we were wrong! We held these option contracts for 45 days, until November 17th, where we sold the contracts at \$0.25 per share. We invested \$1900 and ended up with only \$50, an incredible 97.4% loss! We had several opportunities to sell these option contracts at a profit, but we failed to do so. We did learn an important lesson from this trade; don't hold on to an option contract to the very end, as it will lose practically all of its value.

On October 30th we decided to buy two more option contracts, because the stock price has fallen 17.4% since the beginning of our simulation. EMC was still a solid company, so we decided it was worth the risk. We bought two more November call option contracts at \$8.38 per share. Our strike price for these options was \$80, and the actual stock was trading at \$84.44. Overnight the stock jumped up \$4.62, which was a 5.5% increase. The next day we sold the option contracts at \$11.50 for a profit of \$625. We only held this trade for one day and we made a 37.3% profit.

We cannot totally explain why EMC's value fell. All the news that was reported on EMC was positive and they were surpassing their quarterly earnings and sales. Perhaps EMC's misfortune was just part of the slump that was affecting the whole technology sector.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought EMC it was trading at \$101 per share. Our target price was \$84.88, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$80.82 to \$126.21. The actual result, \$84.88, came in on the low end of the predicted range. The formula calculated that the probability that the target price would be achieved was 78%.

Our second purchase of EMC stock was an option contract. The day before we purchased the option contract, it was trading at \$94. Our target price was again \$84.88. The size of move based on volatility forecast yielded a range of \$74.31 to \$118.89. The actual result, \$84.88 was on the middle to low end of the predicted range. The formula calculated that the probability that the target price would be achieved was 67%.

Our third purchase of EMC stock was another option contract. The day before we purchased the option, it was trading at \$86. Our target price was \$89.06, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$82.37 to \$89.77. The actual result, \$89.06, was on the very top of the predicted range. The formula calculated that the probability that the target price would be achieved was 21%.

EMC Corporation (EMC)

Primary Indicators

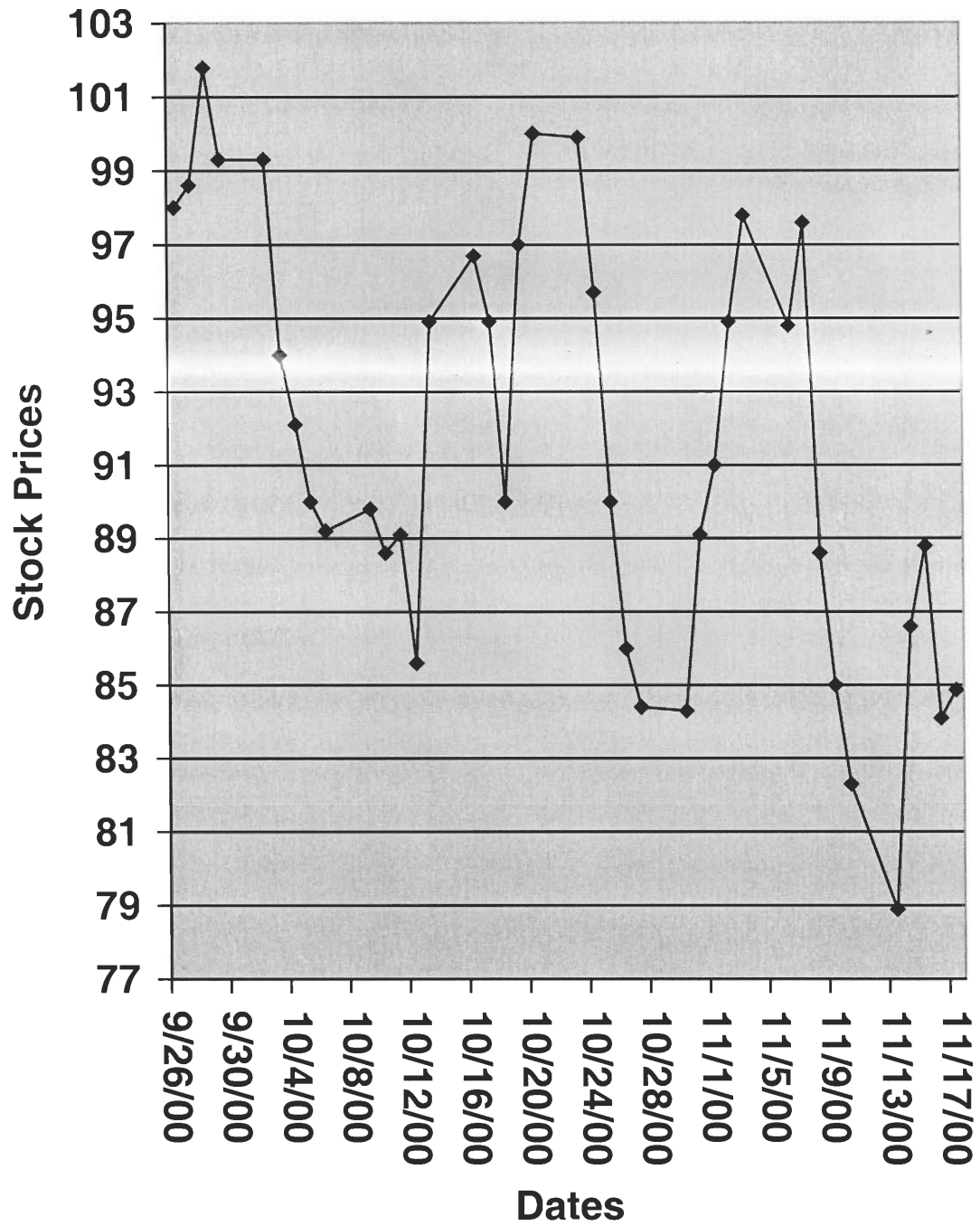
| | |
|----------------------------------|-----------------------------------|
| Net Profit: | 19.9 % |
| Cash Assets: | \$2,096,500,000 |
| Total Debt: | \$222,000,000 |
| Sales/Revenue per share: | 3.85, trend up past 5, up next 2. |
| Cash Flow per Share: | 1.0, tend up past 5, up next 2. |
| Earnings per Share (EPS): | 0.75, trend up past 5, up next 2. |
| 5-Year Sales Gain: | 32 % |
| 5-Year Earnings Gain: | 37.5 % |
| Projected Sales: | 29.5 % |
| Projected Earnings: | 36.5 % |
| Current Ratio: | 3.2 |
| Quick Ratio: | 1.4 |

Secondary Indicators

| | |
|---|--------------------------------------|
| 52 Week High/Low: | \$99.75 & \$29.75 |
| Market Capital: | \$206,318,173,600 |
| Sales: | \$8,485,000,000 |
| Dividend Yield: | 0.0, Emc does not pay out dividends. |
| Insider Buy/Sell/Own: | 1 / 23 / 1.5 % |
| 5-Year Price Appreciation: | 2002 % |
| Projected High/Low: | \$150 & \$100 |
| Timeliness/Safety: | 1 & 3 |
| Current Price to Earnings (P/E): | 206 |
| Average Price to Earnings: | 28.54 |
| Price to Sales (P/S): | 24.6 |
| Price to Book (P/B): | 3.15 |
| Max/Min: | 100 % & 35 % |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

EMC Stock Chart



• EMC 1st Mathematical Computation

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|---------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 8/28/00 | 94.9 | | | | |
| 8/29/00 | 95.6 | 1.007376185 | 0.007349114 | | |
| 8/30/00 | 96.1 | 1.005230126 | 0.005216496 | | |
| 8/31/00 | 98 | 1.019771072 | 0.019578163 | | |
| 9/1/00 | 97.3 | 0.992857143 | -0.007168489 | | |
| 9/5/00 | 95.9 | 0.985611511 | -0.014493007 | | |
| 9/6/00 | 97 | 1.011470282 | 0.011404997 | | |
| 9/7/00 | 99.3 | 1.02371134 | 0.023434593 | | |
| 9/8/00 | 96.5 | 0.971802618 | -0.028602563 | | |
| 9/11/00 | 94.1 | 0.975129534 | -0.025184962 | | |
| 9/12/00 | 94 | 0.998937301 | -0.001063264 | | |
| 9/13/00 | 94.7 | 1.007446809 | 0.007419218 | | |
| 9/14/00 | 95 | 1.003167899 | 0.003162891 | | |
| 9/15/00 | 94.6 | 0.995789474 | -0.004219416 | | |
| 9/18/00 | 95.7 | 1.011627907 | 0.011560822 | | |
| 9/19/00 | 98.3 | 1.027168234 | 0.026805729 | | |
| 9/20/00 | 103.3 | 1.0508647 | 0.049613349 | | |
| 9/21/00 | 95.8 | 0.927395934 | -0.075374691 | | |
| 9/22/00 | 102.9 | 1.074112735 | 0.071494958 | | |
| 9/25/00 | 101 | 0.981535471 | -0.018637126 | 0.03090418 | 59% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|---------------|
| # Of Days 1 = | 52 |
| Time = | 0.37744636 |
| Sigma = | 0.5904235 |
| ((x) + Standard Deviation) = | 1 |
| ((x) – Standard Deviation) = | -1 |
| Current Price = | 101 |
| ((x) Forecasting + Move) = | 126.21 |
| ((x) Forecasting – Move) = | 80.82 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 52 |
| Time Probability = | 0.37744636 |
| Target Price = | 84.88 |
| Volatility = | -0.7802537 |
| Probability % will not hit Target Price | 22% |
| Probability % will hit Target Price | 78% |

• EMC 2nd Mathematical Option Computation

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|---------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| 9/6/00 | 97 | | | | |
| 9/7/00 | 99.3 | 1.02371134 | 0.023434593 | | |
| 9/8/00 | 96.5 | 0.971802618 | -0.028602563 | | |
| 9/11/00 | 94.1 | 0.975129534 | -0.025184962 | | |
| 9/12/00 | 94 | 0.998937301 | -0.001063264 | | |
| 9/13/00 | 94.7 | 1.007446809 | 0.007419218 | | |
| 9/14/00 | 95 | 1.003167899 | 0.003162891 | | |
| 9/15/00 | 94.6 | 0.995789474 | -0.004219416 | | |
| 9/18/00 | 95.7 | 1.011627907 | 0.011560822 | | |
| 9/19/00 | 98.3 | 1.027168234 | 0.026805729 | | |
| 9/20/00 | 103.3 | 1.0508647 | 0.049613349 | | |
| 9/21/00 | 95.8 | 0.927395934 | -0.075374691 | | |
| 9/22/00 | 102.9 | 1.074112735 | 0.071494958 | | |
| 9/25/00 | 101 | 0.981535471 | -0.018637126 | | |
| 9/26/00 | 98 | 0.97029703 | -0.030153038 | | |
| 9/27/00 | 98.6 | 1.006122449 | 0.006103783 | | |
| 9/28/00 | 101.8 | 1.032454361 | 0.031938843 | | |
| 9/29/00 | 99.3 | 0.975442043 | -0.024864533 | | |
| 10/2/00 | 99.3 | 1 | 0 | | |
| 10/3/00 | 94 | 0.946626385 | -0.054850789 | 0.03502452 | 67% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|---------------|
| # Of Days 1 = | 45 |
| Time = | 0.35112344 |
| Sigma = | 0.6691426 |
| ((x) + Standard Deviation) = | 1 |
| ((x) – Standard Deviation) = | -1 |
| Current Price = | 94 |
| ((x) Forecasting + Move) = | 118.89 |
| ((x) Forecasting – Move) = | 74.31 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 45 |
| Time Probability = | 0.35112344 |
| Target Price = | 84.13 |
| Volatility = | -0.4721463 |
| Probability % will not hit Target Price | 33% |
| Probability % will hit Target Price | 67% |

• EMC 3rd Mathematical Option Computation

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|----------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| 9/29/00 | 99.3 | | | | |
| 10/2/00 | 99.3 | 1 | 0 | | |
| 10/3/00 | 94 | 0.946626385 | -0.054850789 | | |
| 10/4/00 | 92.1 | 0.979787234 | -0.020419839 | | |
| 10/5/00 | 90 | 0.977198697 | -0.023065273 | | |
| 10/6/00 | 89.2 | 0.991111111 | -0.008928631 | | |
| 10/9/00 | 89.8 | 1.006726457 | 0.006703936 | | |
| 10/10/00 | 88.6 | 0.986636971 | -0.013453118 | | |
| 10/11/00 | 89.13 | 1.005981941 | 0.005964121 | | |
| 10/12/00 | 85.6 | 0.960394929 | -0.040410695 | | |
| 10/13/00 | 94.94 | 1.10911215 | 0.10355983 | | |
| 10/16/00 | 96.69 | 1.018432694 | 0.018264871 | | |
| 10/17/00 | 94.93 | 0.981797497 | -0.018370207 | | |
| 10/18/00 | 90 | 0.948066997 | -0.053330108 | | |
| 10/19/00 | 97 | 1.077777778 | 0.074901308 | | |
| 10/20/00 | 100 | 1.030927835 | 0.030459207 | | |
| 10/23/00 | 99.9 | 0.999 | -0.0010005 | | |
| 10/24/00 | 95.7 | 0.957957958 | -0.042951387 | | |
| 10/25/00 | 90 | 0.940438871 | -0.061408628 | | |
| 10/26/00 | 86 | 0.955555556 | -0.045462374 | 0.04301483 | 82% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 1 |
| Time = | 0.05234239 |
| Sigma = | 0.8217972 |
| ((x) + Standard Deviation) = | 1 |
| ((x) – Standard Deviation) = | -1 |
| Current Price = | 86 |
| ((x) Forecasting + Move) = | 89.77 |
| ((x) Forecasting – Move) = | 82.37 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 1 |
| Time Probability = | 0.05234239 |
| Target Price = | 89.06 |
| Volatility = | 0.81281273 |
| Probability % will not hit Target Price | 79% |
| Probability % will hit Target Price | 21% |

5.1.5 - Four Seasons Hotels, Inc. (FS)

Four Seasons Hotels, Inc. is engaged in the management of, and the investment in, hotels and resorts throughout North America, Europe, Asia, Australia, and the Caribbean. The Company manages 47 luxury hotel and resort properties, primarily under the Four Seasons and Regent brand names. Four Seasons Hotels, Inc. also has several hotels and resorts under construction or development. The Company's strategy is to offer business and leisure travelers the finest accommodation in each destination it serves.

Four Seasons Hotels, Inc. is a stock that was recommended in "A guide to the 50 Best Stocks in the World" by Andrew Leckey. The company went public in 1997, therefore it does not have all of the data that we needed for our indicator worksheet. In addition, Four Seasons is not one of the 1,700 companies that *Value Line* covers, so it was difficult and in some cases impossible to find certain stock indicators. Since the company went public in 1997 it has yet to have a stock split occur. Upon examination of the stock indicators that we used, we found that the company had a poor current ratio, quick ratio and a huge amount of debt. On the other hand, the company has had an upward trend of earnings per share since it went public. Although the stock indicators were not very impressive, we bought the stock because of its stock value over the past two years, it has increased almost 300%. In addition, we wanted to mix up our portfolio by investing in a company not related to the technology field.

On October 4th, 2000, we purchased 132 shares at \$75.68 per share for a total investment of \$9,989.76. The stock quickly dropped in value, and never returned to its original price during the course of our simulation. We held the stock for 45 days, then

finally sold it at the end of our simulation on November 17th at \$65.44 per share. Our final result for this trade was a loss of \$1,351.68, which represents a 13.5% loss.

We feel that we made a mistake with this purchase. We should have done more research on Four Seasons before making our purchase. It wasn't until after our purchase that we learned that several analyst groups had downgraded the hotel chain. On May 15th, 19th, 24th and July 26th four different analyses groups downgraded Four Season Hotels. While we were busy looking at numbers and ratios, we neglected to research news articles related to the company. While we lost a good deal of money on Four Seasons, we did learn that there is more to researching a company than just examining it's stock indicators.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought Four Seasons it was trading at \$74.50 per share. Our target price was \$65.44, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$58.48 to \$94.89. The actual result, \$65.44, came in on the low end of the predicted range. The formula calculated that the probability that the target price would be achieved was 70%.

Four Seasons (FS) Stock Indicators

Primary Indicators

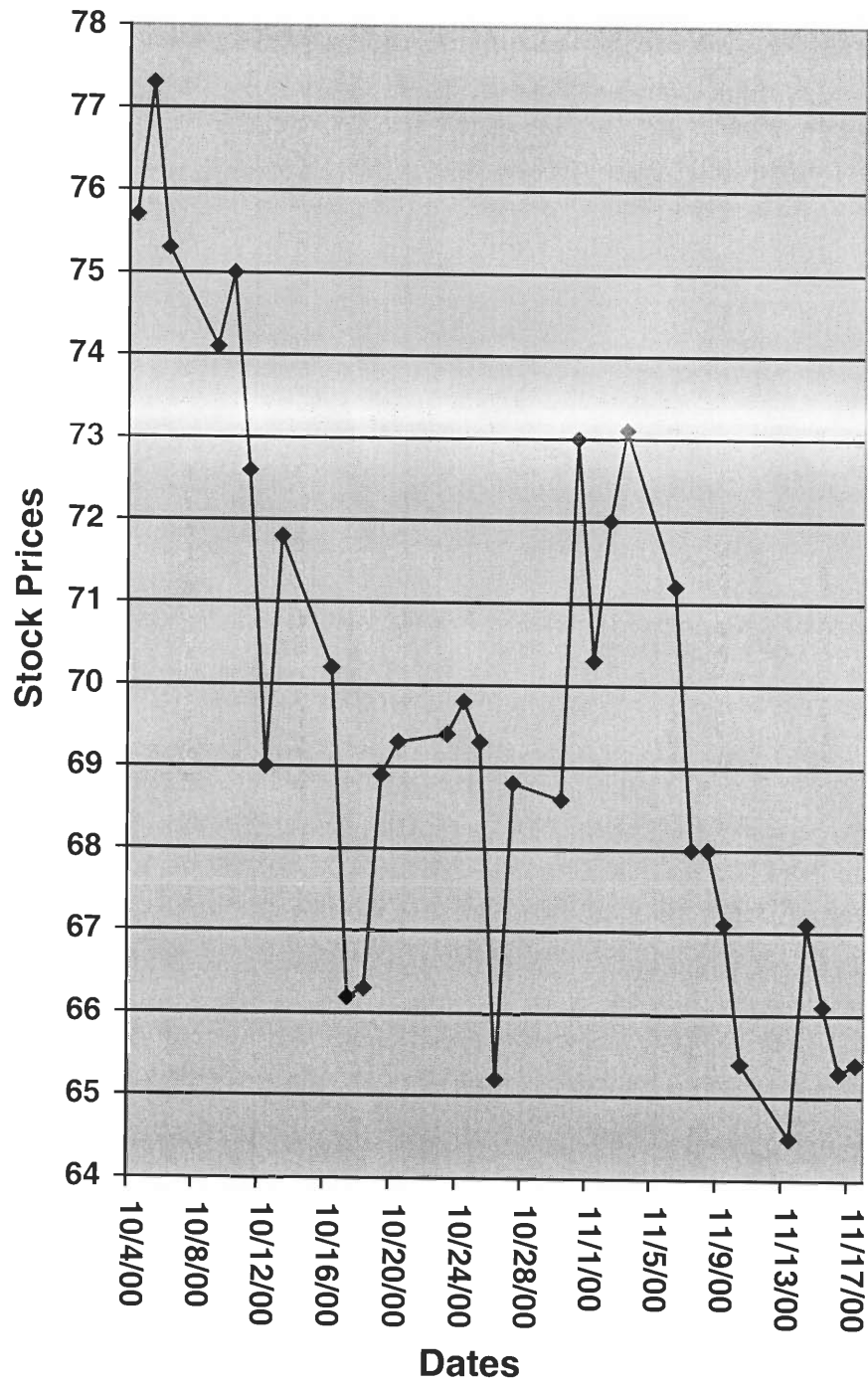
| | |
|----------------------------------|--------------------------------|
| Net Profit: | Unknown |
| Cash: | \$68,400,000 |
| Total Debt: | \$134,000,000, debt>cash |
| Sales/Revenue per Share: | \$5.52 |
| Cash Flow per Share: | Unknown |
| Earnings per Share (EPS): | \$1.74, trend up past 4 years. |
| 5-Year Sales Gain: | NA |
| 5-Year Earnings Gain: | NA |
| Projected Sales: | Unknown |
| Projected Earnings: | Unknown |
| Current Ratio: | 4.6 |
| Quick Ratio: | 4.5 |

Secondary Indicators

| | |
|---|------------------------------------|
| 52 Week High/Low: | \$81.25 / \$34.06 |
| Market Capital: | \$2,560,000,000 |
| Sales: | \$191,000,000 |
| Dividend Yield: | 0.1 % |
| 5-year Price Appreciation: | 196 %, company went public in 1997 |
| Projected High/Low: | Unknown |
| Timeliness/Safety: | Unknown |
| Current Price to Earnings (P/E): | 26.2 |
| Average Price to Earnings: | NA |
| Price to Sales (P/S): | \$9.61 |
| Price to Book (P/B): | \$6.06 |
| Max/Min: | Unknown |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

Four Season Hotel Inc. Chart



• Four Season Hotels, Inc. Mathematical Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|---------|-------------|----------------------|---------------------------|--------------------|----------------------------|
| | | | | | |
| 9/6/00 | 79.8 | | | | |
| 9/7/00 | 80.2 | 1.005012531 | 0.00500001 | | |
| 9/8/00 | 78.5 | 0.978802993 | -0.02142489 | | |
| 9/11/00 | 78.6 | 1.001273885 | 0.001273075 | | |
| 9/12/00 | 80 | 1.017811705 | 0.017654935 | | |
| 9/13/00 | 74.6 | 0.9325 | -0.069886127 | | |
| 9/14/00 | 71.3 | 0.955764075 | -0.04524418 | | |
| 9/15/00 | 70.2 | 0.98457223 | -0.015548016 | | |
| 9/18/00 | 67 | 0.954415954 | -0.046655692 | | |
| 9/19/00 | 73.4 | 1.095522388 | 0.091231316 | | |
| 9/20/00 | 71.5 | 0.974114441 | -0.026226486 | | |
| 9/21/00 | 73.1 | 1.022377622 | 0.022130917 | | |
| 9/22/00 | 76.6 | 1.047879617 | 0.04676871 | | |
| 9/25/00 | 75.6 | 0.98694517 | -0.013140794 | | |
| 9/26/00 | 75.8 | 1.002645503 | 0.002642009 | | |
| 9/27/00 | 76.4 | 1.007915567 | 0.007884404 | | |
| 9/28/00 | 76 | 0.994764398 | -0.005249356 | | |
| 9/29/00 | 73.2 | 0.963157895 | -0.037537919 | | |
| 10/2/00 | 74 | 1.010928962 | 0.010869672 | | |
| 10/3/00 | 74.5 | 1.006756757 | 0.006734032 | 0.03607739 | 69% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 45 |
| Time = | 0.35112344 |
| Sigma = | 0.6892576 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 74.5 |
| ((x) Forecasting + Move) = | 94.89 |
| ((x) Forecasting - Move) = | 58.48 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 45 |
| Time Probability = | 0.35112344 |
| Target Price = | 65.44 |
| Volatility = | -0.5357755 |
| Probability % will not hit Target Price | 30% |
| Probability % will hit Target Price | 70% |

5.1.6 - Elantec Semiconductors (ELNT)

Elantec Semiconductor, Inc. designs, manufactures and markets high performance analog integrated circuits primarily for the video, optical storage, integrated DC:DC, and xDSL markets. The Company offers approximately 150 products such as amplifiers, drivers, faders, transceivers and multiplexers. Elantec targets high growth commercial markets in which advances in digital technology have increased the demand for high speed, high precision and low power consumption analog circuits.

At this point in our simulation, all five of our previous stock purchases and both of our previous option contracts had failed. We were frustrated and searching for a strategy that would help us be successful traders. At this point we developed a method known as the 100% Movers Strategy. Using this strategy we discovered Elantec. Over the past two years Elantec's stock price has grown at a rate of 4000%. Over the past year, 3-months and 1-month Elantec has grown at a rate of 816%, 41% and 9.1% respectively. Using our guidelines based on the 100% Movers strategy we decided to purchase Elantec. Based on research and assessment of the company's stock indicators that were available, Elantec seemed like a good value. The company's debt was small compared to its cash on hand. The current and quick ratios looked good and the sales per share were on an upward trend. The only primary indicators that troubled us were the cash flow per share and earnings per share, which were both down in 1997 and 1999.

On October 10th, 2000, we purchased 119 shares at \$83.50 per share for a total investment of \$9,936.50. The stock had dropped \$8 from the previous day and we were hoping it would quickly rebound. We watched this stock go up and down repeatedly

during the three-week period that we held it. This stock was extremely volatile, so we decided to sell it on October 31 at \$111.25 per share after it had an increase of \$14 over one day. Our final result for this trade was a profit of \$3,302.25, which represents a 33.2% profit.

Later, we purchased one November call option contract. This stock had been very volatile and we were hoping to take advantage of its volatility. We decided to buy the option on a day that the price fell \$11. On October 30th we purchased 1 November call option contract for \$1,750 at \$17.50 per share. Our strike price was \$85 and the actual stock price was \$96.56. The next day the stock increased from \$96.56 to \$111.25, and we sold it at \$29.13 per share, for a total of \$2,913. We profited \$1,163, which represents a 66.4% increase on a one-day trade. With this trade we were able to see the potential in option trading.

Perhaps Elantec's value increased so much because of the plethora of positive news related to the company. Elantec had recently announced several new products. Analysts pronounced that the company was extremely well managed. Also, Elantec bought back a million shares of their own stock, showing that the company had confidence in itself.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought Elantec it was trading at \$91.70 per share. Our target price was \$111.25, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$74.39 to \$113.03. The actual result, \$111.25, came in on the high end

of the predicted range. The formula calculated that the probability that the target price would be achieved was 18%.

Our second purchase of Elantec stock was an option contract. The day before we purchased the option contract, it was trading at \$107.37. Our target price was \$111.25. The size of move based on volatility forecast yielded a range of \$88.65 to \$105.25. The actual result, \$111.25 was above the predicted range. The formula calculated that the probability that the target price would be achieved was only 5%.

Elantec Semiconductors (ELNT) Stock Indicators

Primary Indicators

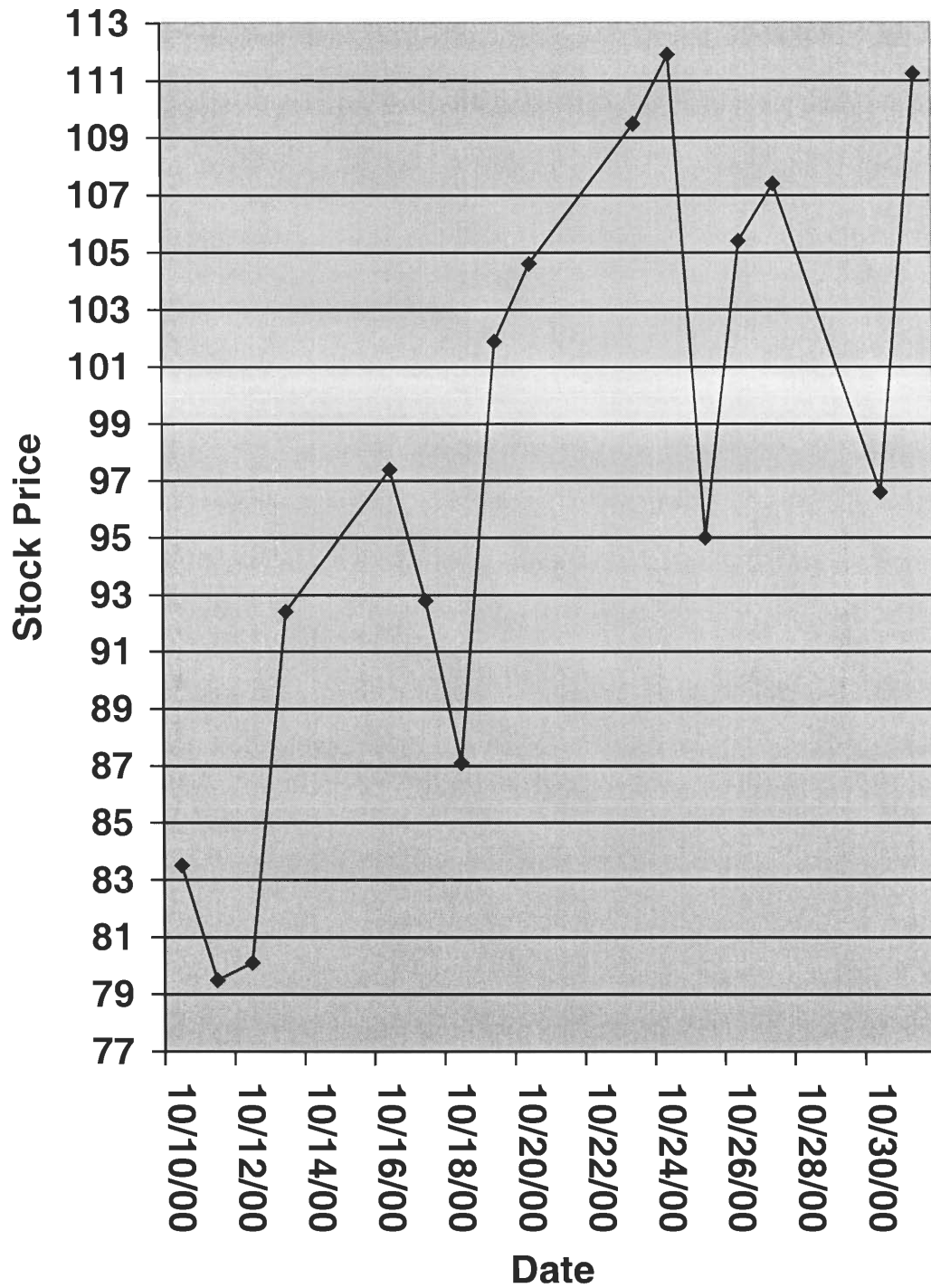
| | |
|----------------------------------|--|
| Net Profit: | 9.1% |
| Cash: | \$19.7 million |
| Total Debt: | \$3.6 million |
| Sales/Revenue per Share: | 2.70 (upward trend, tho down some in 97) |
| Cash Flow per Share: | .41 (down 97, up 98, down 99) |
| Earnings per Share (EPS): | .25 (down 97, up 98, down 99) |
| 5-Year Sales Gain: | NA |
| 5-Year Earnings Gain: | NA |
| Projected Sales: | NA |
| Projected Earnings: | NA |
| Current Ratio: | 2.73 |
| Quick Ratio: | 1.41 |

Secondary Indicators

| | |
|---|----------------|
| 52wk High/Low: | 6.5/107 |
| Sales: | \$50.7 million |
| Dividend Yield: | nil |
| 5-Year Price Appreciation: | 1313% |
| Projected High/Low: | NA |
| Timeliness/Safety: | 2/4 |
| Current Price to Earnings (P/E): | NA |
| Average Price to Earnings: | 31.58 |
| Price to Sales (P/S): | 36.1 |
| Price to Book (P/B) | 1.57 |
| Max/Min: | NA |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

Elantec Stock Chart



• Elantec Mathematical Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|---------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 9/12/00 | 79.3 | | | | |
| 9/13/00 | 78.4 | 0.988650694 | -0.011414201 | | |
| 9/14/00 | 79 | 1.007653061 | 0.007623925 | | |
| 9/15/00 | 77.1 | 0.975949367 | -0.024344572 | | |
| 9/18/00 | 77.9 | 1.010376135 | 0.010322672 | | |
| 9/19/00 | 81.4 | 1.044929397 | 0.04394932 | | |
| 9/20/00 | 91.8 | 1.127764128 | 0.120237025 | | |
| 9/21/00 | 90.2 | 0.982570806 | -0.017582871 | | |
| 9/22/00 | 90.9 | 1.007760532 | 0.007730574 | | |
| 9/25/00 | 91.1 | 1.00220022 | 0.002197803 | | |
| 9/26/00 | 94.8 | 1.040614709 | 0.039811605 | | |
| 9/27/00 | 99.8 | 1.052742616 | 0.051398774 | | |
| 9/28/00 | 101.7 | 1.019038076 | 0.01885912 | | |
| 9/29/00 | 99.6 | 0.979351032 | -0.020865138 | | |
| 10/2/00 | 98.4 | 0.987951807 | -0.012121361 | | |
| 10/3/00 | 95.1 | 0.966463415 | -0.034111835 | | |
| 10/4/00 | 100.9 | 1.060988433 | 0.059200958 | | |
| 10/5/00 | 93.1 | 0.922695738 | -0.080455743 | | |
| 10/6/00 | 88.1 | 0.946294307 | -0.055201651 | | |
| 10/9/00 | 91.7 | 1.040862656 | 0.040049846 | 0.04564135 | 87% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|---------------|
| # Of Days 1 = | 21 |
| Time = | 0.23986297 |
| Sigma = | 0.8719768 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 91.7 |
| ((x) Forecasting + Move) = | 113.03 |
| ((x) Forecasting - Move) = | 74.39 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 21 |
| Time Probability = | 0.23986297 |
| Target Price = | 111.25 |
| Volatility = | 0.92399222 |
| Probability % will not hit Target Price | 82% |
| Probability % will hit Target Price | 18% |

• Elantec 2nd Mathematical Option Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|----------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 10/3/00 | 95.1 | | | | |
| 10/4/00 | 100.9 | 1.060988433 | 0.059200958 | | |
| 10/5/00 | 93.1 | 0.922695738 | -0.080455743 | | |
| 10/6/00 | 88.1 | 0.946294307 | -0.055201651 | | |
| 10/9/00 | 91.7 | 1.040862656 | 0.040049846 | | |
| 10/10/00 | 83.5 | 0.910577972 | -0.093675747 | | |
| 10/11/00 | 79.5 | 0.952095808 | -0.04908961 | | |
| 10/12/00 | 80.1 | 1.00754717 | 0.007518832 | | |
| 10/13/00 | 92.4 | 1.153558052 | 0.142851125 | | |
| 10/16/00 | 97.4 | 1.054112554 | 0.052699232 | | |
| 10/17/00 | 92.8 | 0.952772074 | -0.048379571 | | |
| 10/18/00 | 87.1 | 0.938577586 | -0.063389756 | | |
| 10/19/00 | 101.9 | 1.169919633 | 0.156935056 | | |
| 10/20/00 | 104.6 | 1.026496565 | 0.026151611 | | |
| 10/23/00 | 109.5 | 1.046845124 | 0.045780998 | | |
| 10/24/00 | 111.9 | 1.021917808 | 0.021681066 | | |
| 10/25/00 | 95 | 0.848972297 | -0.163728724 | | |
| 10/26/00 | 105.4 | 1.109473684 | 0.103885745 | | |
| 10/27/00 | 107.4 | 1.018975332 | 0.018797546 | | |
| 10/30/00 | 96.6 | 0.899441341 | -0.105981441 | 0.08578507 | 164% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|---------------|
| # Of Days 1 = | 1 |
| Time = | 0.05234239 |
| Sigma = | 1.6389215 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 96.6 |
| ((x) Forecasting + Move) = | 105.25 |
| ((x) Forecasting - Move) = | 88.65 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 1 |
| Time Probability = | 0.05234239 |
| Target Price = | 111.25 |
| Volatility = | 1.6459878 |
| Probability % will not hit Target Price | 95% |
| Probability % will hit Target Price | 5% |

5.1.7 - Harley Davidson, Inc. (HDI)

Harley-Davidson, Inc. (HDI) designs, manufactures and markets heavyweight motorcycles, parts, accessories, collectibles and riding apparel. Harley-Davidson Financial Services, Inc., a wholly owned subsidiary of HDI, provides financing programs to dealers and retail customers. Additionally, Harley-Davidson Financial Services, Inc. is an agency for certain unaffiliated insurance carriers providing property and casualty insurance and extended service contracts to motorcycle owners.

Harley-Davidson was one of the companies that we found by using the 100% Movers strategy. During the past 5-years, 2-years, 1-year, 3-months and 1-month trends Harley-Davidson stock price performance has been growing at a rate of 587%, 220%, 97%, 20% and -3.2% respectively. During the 1990's Harley-Davidson has had five 2-for-1 stock splits. The only negative figure for this stock was the most recent 1-month trend, which had a negative growth rate. We decided to purchase the stock despite its past month's performance due to our belief that stock would continue to grow. Briefly examining the company's stock indicators, we found that the company had more debt than cash and the Net-profit margin was a little low. On the other hand, all of the trends of the past five years were up. In the end, we decided that the indicators were good enough for us to purchase the stock.

On October 12th, 2000, we purchased 229 shares at \$43.50 per share for a total investment of \$9,961.50. The stock's price had dropped from \$48 a week earlier. The stock rebounded, and its price steadily climbed until November 8th when the stock price peaked at \$49.75 and began to fall. Before the price began to fall too far, we decided to

sell the stock on November 10 at \$47.17 per share. After holding onto the stock for 30 days, we made a profit of \$845.01, which represents an 8.5% profit.

Four days after we purchased Harley-Davidson's stock, AG Edwards upgraded the stock on October 16. This positive news could have caused the stock's price to climb a bit. One possible explanation for the previous 1-month trend of negative growth may be that Robert W. Baird downgraded Harley-Davidson on August 9.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought Harley-Davidson, it was trading at \$46.50 per share. Our target price was \$47.17, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$42.17 to \$51.26. The actual result, \$47.17, came in on the middle of the predicted range. The formula calculated that the probability that the target price would be achieved was 44%.

Harley-Davidson Inc. (HDI) Stock Indicators

Primary Indicators

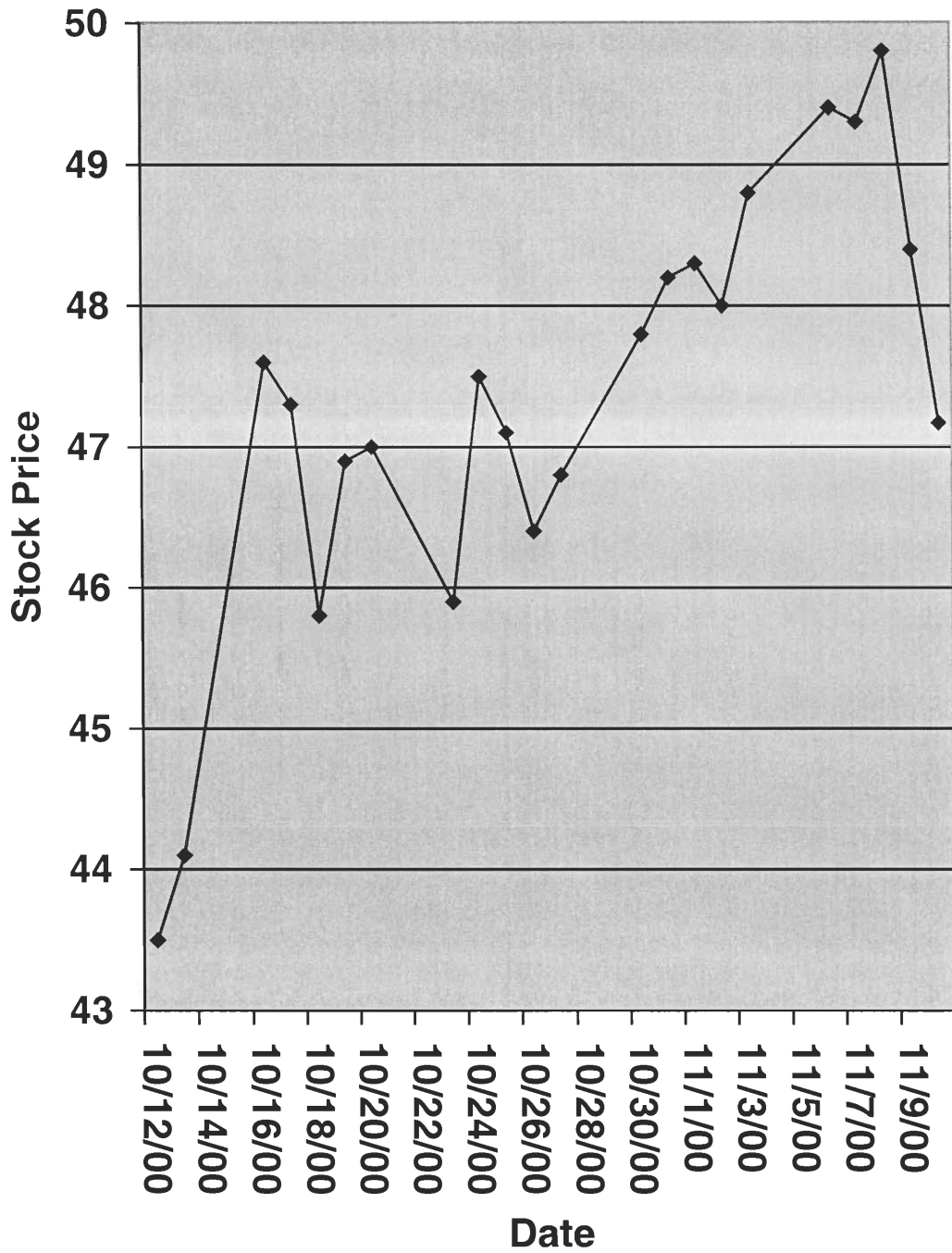
| | |
|----------------------------------|---|
| Net Profit: | 11.9 % |
| Cash: | \$297,900,000 |
| Total Debt: | \$328,200,000, debt > cash. |
| Sales/Revenue per Share: | \$9.50, trend up past 5 years, up next 2. |
| Cash Flow per Share: | \$1.50, trend up past 5 years, up next 2. |
| Earnings per Share (EPS): | \$1.10, trend up past 5 years, up next 2. |
| 5-Year Sales Gain: | 10.5 % |
| 5-Year Earnings Gain: | 22.5 % |
| Projected Sales: | 15.5 % |
| Projected Earnings: | 20.0 % |
| Current Ratio: | 2.3 |
| Quick Ratio: | 1.8 |

Secondary Indicators

| | |
|---|-------------------|
| 52 Week High/Low: | \$50.63 / \$27.81 |
| Market Capital: | \$14,293,000,000 |
| Sales: | \$2,721,000,000 |
| Dividend Yield: | 0.2 % |
| Insider Buy/Sell/Own: | 0 / 10 / 2.6 % |
| 5-Year Price Appreciation: | 587 % |
| Projected High/Low: | \$60 & \$40 |
| Timeliness/Safety: | 2 & 3 |
| Current Price to Earnings (P/E): | 44.2 |
| Average Price to Earnings: | 23.62 |
| Price to Sales (P/S): | \$3.95 |
| Price to Book (P/B): | \$11.31 |
| Max/Min: | 35 % & -10 % |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad.

Harley-Davidson Stock Chart



• Harley-Davidson Mathematical Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|----------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 9/14/00 | 50 | | | | |
| 9/15/00 | 48.9 | 0.978 | -0.022245609 | | |
| 9/18/00 | 48.4 | 0.989775051 | -0.010277583 | | |
| 9/19/00 | 48.3 | 0.997933884 | -0.002068253 | | |
| 9/20/00 | 47.9 | 0.991718427 | -0.008316056 | | |
| 9/21/00 | 47.3 | 0.987473904 | -0.012605209 | | |
| 9/22/00 | 46.9 | 0.99154334 | -0.00849262 | | |
| 9/25/00 | 48.4 | 1.031982942 | 0.031482138 | | |
| 9/26/00 | 46.8 | 0.966942149 | -0.033616611 | | |
| 9/27/00 | 47.6 | 1.017094017 | 0.016949558 | | |
| 9/28/00 | 48.2 | 1.012605042 | 0.01252626 | | |
| 9/29/00 | 47.9 | 0.993775934 | -0.006243517 | | |
| 10/2/00 | 49.2 | 1.027139875 | 0.026778119 | | |
| 10/3/00 | 49.6 | 1.008130081 | 0.00809721 | | |
| 10/4/00 | 49.6 | 1 | 0 | | |
| 10/5/00 | 48 | 0.967741935 | -0.032789823 | | |
| 10/6/00 | 48.3 | 1.00625 | 0.00623055 | | |
| 10/9/00 | 48.1 | 0.995859213 | -0.004149384 | | |
| 10/10/00 | 47.3 | 0.983367983 | -0.016771882 | | |
| 10/11/00 | 46.5 | 0.983086681 | -0.017057983 | 0.0178236 | 34% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 30 |
| Time = | 0.29609328 |
| Sigma = | 0.3405194 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 46.5 |
| ((x) Forecasting + Move) = | 51.26 |
| ((x) Forecasting - Move) = | 42.17 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 30 |
| Time Probability = | 0.29609328 |
| Target Price = | 47.17 |
| Volatility = | 0.14188657 |
| Probability % will not hit Target Price | 56% |
| Probability % will hit Target Price | 44% |

5.1.8 - MetLife (MET)

MetLife, Inc. provides insurance and financial services to a wide range of institutional and individual customers. The Company currently provides individual insurance, annuities and investment products to approximately one out of every 11 households in the United States. MetLife also provides group insurance and retirement and savings products and services to approximately 64,000 corporations and other institutions.

Using the 100% Movers Strategy, we identified MetLife as a momentum mover. MetLife just went public in April 2000; its initial stock price offering (IPO) was \$15.25 per share. During the past 5-months, 3-months and 1-month trends MetLife stock price performance has been growing at a rate of 69%, 25% and 4% respectively. With the rigorous growth in the initial five months, we decided to purchase MetLife stocks based on the 100% Movers Strategy. With only 4½ weeks left in our simulation, we were more concerned about momentum buying instead of the company's financial stability, so we decided not to use the stock indicators.

On October 17th, 2000, we purchased 388 shares at \$25.75 per share for a total investment of \$9,991.00. The stock price hovered around \$24 for a week, and then started to increase to \$26 then \$27 until it reached a price of \$29.88 per share on November 10th. At this point, we decided to sell the stock after holding it for 25 days. Our final result was a profit of \$1,602.44, which represents a 16% increase.

We also purchased six November call option contracts on October 31st for \$1,764 at the relatively cheap price of \$2.94 per share. We decided to purchase these option

contracts based on the company's growth rate over the past five months. Our strike price was \$25, and the actual stock price was at \$27.63. The next day the stock increased to \$28.50 then fell a few dollars until it rebounded back to \$29.69. We then sold the stock at \$3.38 per share, for a total sum of \$2,028. We profited \$264, which represents a 14.97% increase. We held the option contracts for 10 days. We wanted to sell these contracts sooner than later, because the closer we get to the expiration date, the faster the contracts will lose their value. We did not want to repeat the same mistake that we made with our first two option contract purchases, Intel and EMC.

Perhaps MetLife's increase in value was caused by the fact that they had surpassed their first quarterly earnings by 26%. On the other hand, several analyst groups had downgraded the company. It seems that there was no solid indication in the news that could have helped us to predict how the stock would behave.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought MetLife it was trading at \$25.40 per share. Our target price was \$29.88, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$22.10 to \$29.18. The actual result, \$29.88, came in just above the high end of the predicted range. The formula calculated that the probability that the target price would be achieved was 12%.

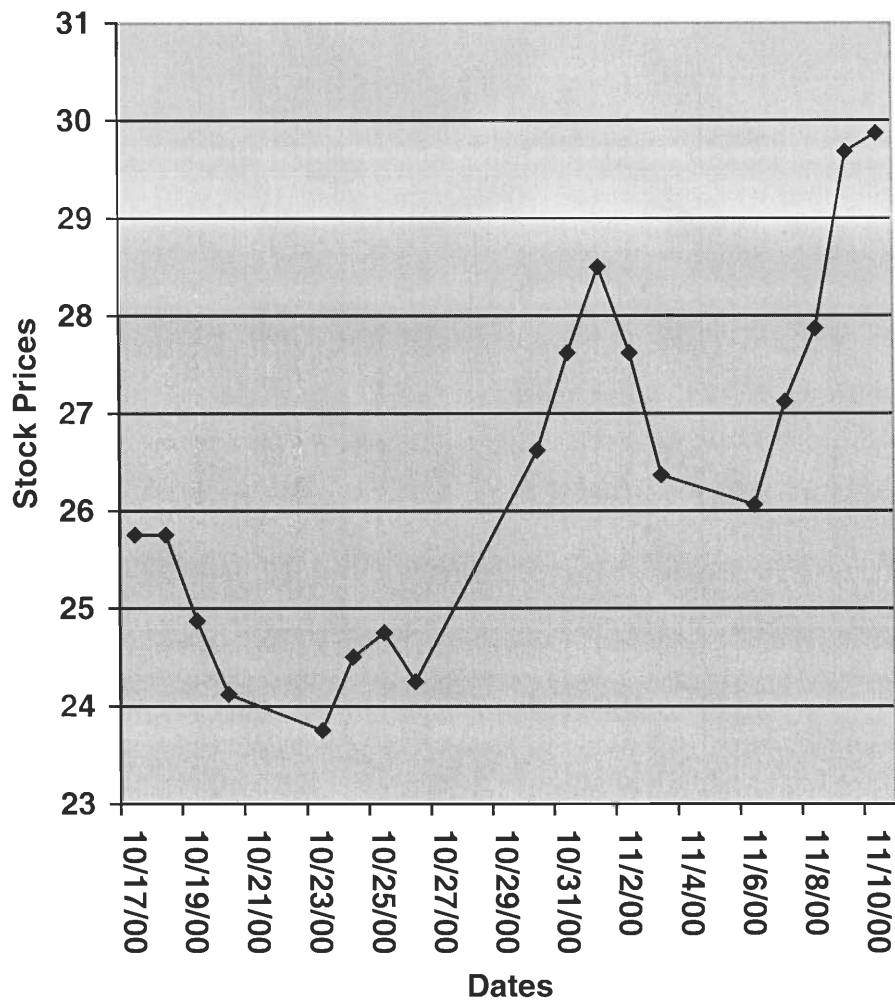
Our second purchase of metLife stock was an option contract. The day before we purchased the option contract, it was trading at \$26.62. Our target price was \$29.69. The size of move based on volatility forecast yielded a range of \$24.26 to \$29.20. The actual

result, \$29.69 was just above the predicted range. The formula calculated that the probability that the target price would be achieved was only 12%.

MetLife (MET)

NO STOCK INDICATORS – we decided not use the indicators. We are looking for momentum movers and that why we only used the 100% Movers Method.

MetLife Stock Chart



• MetLife mathematical Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|----------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 9/19/00 | 24.7 | | | | |
| 9/20/00 | 24.3 | 0.983805668 | -0.016326893 | | |
| 9/21/00 | 24.1 | 0.991769547 | -0.00826451 | | |
| 9/22/00 | 24.8 | 1.029045643 | 0.028631813 | | |
| 9/25/00 | 24.6 | 0.991935484 | -0.00809721 | | |
| 9/26/00 | 25.3 | 1.028455285 | 0.028057953 | | |
| 9/27/00 | 26.4 | 1.043478261 | 0.042559614 | | |
| 9/28/00 | 27.2 | 1.03030303 | 0.029852963 | | |
| 9/29/00 | 26.3 | 0.966911765 | -0.033648034 | | |
| 10/2/00 | 26.4 | 1.003802281 | 0.003795071 | | |
| 10/3/00 | 25.5 | 0.965909091 | -0.034685558 | | |
| 10/4/00 | 24.9 | 0.976470588 | -0.023810649 | | |
| 10/5/00 | 26.2 | 1.052208835 | 0.050891607 | | |
| 10/6/00 | 26.2 | 1 | 0 | | |
| 10/9/00 | 26 | 0.992366412 | -0.007662873 | | |
| 10/10/00 | 25.6 | 0.984615385 | -0.015504187 | | |
| 10/11/00 | 25.3 | 0.98828125 | -0.011787956 | | |
| 10/12/00 | 24.2 | 0.956521739 | -0.044451763 | | |
| 10/13/00 | 25 | 1.033057851 | 0.032523192 | | |
| 10/16/00 | 25.4 | 1.016 | 0.015873349 | 0.02778809 | 53% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 25 |
| Time = | 0.26171196 |
| Sigma = | 0.5308906 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 25.4 |
| ((x) Forecasting + Move) = | 29.18 |
| ((x) Forecasting - Move) = | 22.10 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 25 |
| Time Probability = | 0.26171196 |
| Target Price = | 29.88 |
| Volatility = | 1.16913547 |
| Probability % will not hit Target Price | 88% |
| Probability % will hit Target Price | 12% |

• MetLife 2nd Mathematical Option Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|----------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 10/3/00 | 25.5 | | | | |
| 10/4/00 | 24.9 | 0.976470588 | -0.023810649 | | |
| 10/5/00 | 26.2 | 1.052208835 | 0.050891607 | | |
| 10/6/00 | 26.2 | 1 | 0 | | |
| 10/9/00 | 26 | 0.992366412 | -0.007662873 | | |
| 10/10/00 | 25.6 | 0.984615385 | -0.015504187 | | |
| 10/11/00 | 25.3 | 0.98828125 | -0.011787956 | | |
| 10/12/00 | 24.2 | 0.956521739 | -0.044451763 | | |
| 10/13/00 | 25 | 1.033057851 | 0.032523192 | | |
| 10/16/00 | 25.4 | 1.016 | 0.015873349 | | |
| 10/17/00 | 25.75 | 1.013779528 | 0.013685453 | | |
| 10/18/00 | 25.75 | 1 | 0 | | |
| 10/19/00 | 24.9 | 0.966990291 | -0.033566824 | | |
| 10/20/00 | 24.1 | 0.967871486 | -0.032655963 | | |
| 10/23/00 | 23.8 | 0.987551867 | -0.01252626 | | |
| 10/24/00 | 24.5 | 1.029411765 | 0.028987537 | | |
| 10/25/00 | 24.8 | 1.012244898 | 0.012170536 | | |
| 10/26/00 | 24.3 | 0.97983871 | -0.020367303 | | |
| 10/27/00 | 25 | 1.028806584 | 0.028399475 | | |
| 10/30/00 | 26.62 | 1.0648 | 0.062786988 | 0.02931884 | 56% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 10 |
| Time = | 0.16552118 |
| Sigma = | 0.5601356 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 26.62 |
| ((x) Forecasting + Move) = | 29.20 |
| ((x) Forecasting - Move) = | 24.26 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 10 |
| Time Probability = | 0.16552118 |
| Target Price = | 29.69 |
| Volatility = | 1.17724519 |
| Probability % will not hit Target Price | 88% |
| Probability % will hit Target Price | 12% |

5.1.9 - Vertex Industries (VETX)

Vertex Interactive, Inc. provides systems integration and middleware solutions specializing in middleware technologies, data collection solutions, warehouse management systems and the integration of electronic commerce applications with existing computing infrastructures. Vertex Interactive, Inc. has also developed proprietary Web-enabling and e-business related technologies. The company currently operates throughout North America and Europe and its international presence is growing rapidly.

We came across Vertex Industries using the 100% Movers Strategy. With only four weeks left in our simulation, we were looking for momentum movers. During the past 5-years, 2-years, 1-year, 3-months and 1-month stock price trends Vertex has performed at a rate of 1581%, 740%, 320%, 52% and 24% respectively. The company has shown an aggressive growth rate over the past five years, and it has satisfied the requirements of the past 3 and 1-month trends with the growth rates of 52% and 24% increases. The company has had zero stock splits ever since it went public in 1993. As we were using the 100% Movers Strategy we did not use stock indicators for this trade.

On October 17th, we purchased 594 shares of Vertex Industries at \$16.81 per share for a total investment of \$9,985.14. The stock price stayed around \$15 per share for a few weeks before it started to lose its value on November 10th. We held the stock until the end of our simulation in hopes that it would rebound, but it kept dropping. We finally sold the stock on November 17th at \$12.00 per share. We held the stocks for 32 days. Our final result for this trade was a loss of \$2,857.14, which represents a 28.6%

loss. This was the only trade in our simulation that we lost money on while using the 100% Movers Strategy.

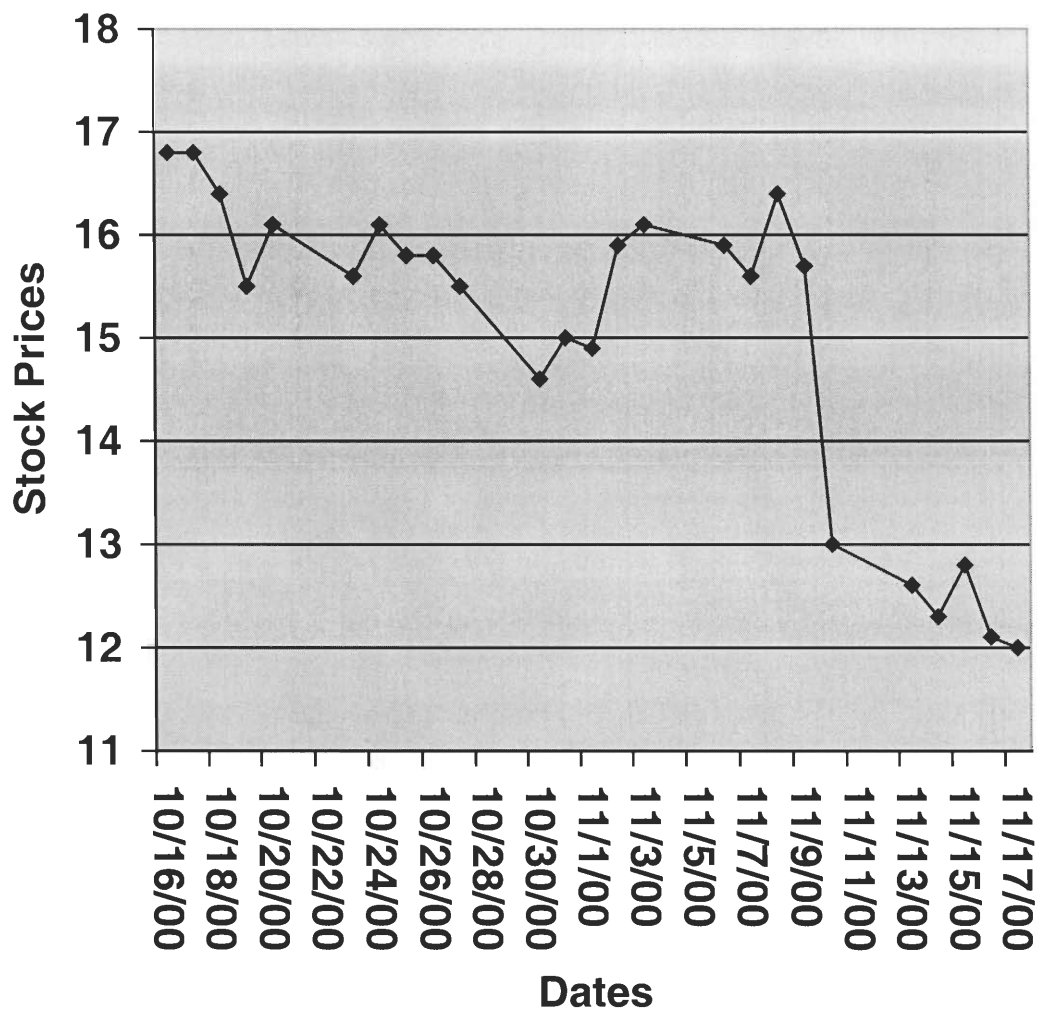
It is unknown to us why the stock's price went down during the course of our simulation. We could not find any negative news about the company. In fact, only good news surfaced about the company. Vertex reported a 370% increase in their revenue (\$47.8 million) for the year ending September 30th, 2000. Perhaps we should have examined the company's stock indicators to give us a better financial view of the company.

After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought Vertex Industries it was trading at \$16.80 per share. Our target price was \$12.00, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$11.13 to \$25.33. The actual result, \$12.00, came in on the low end of the predicted range. The formula calculated that the probability that the target price would be achieved was 79%.

Vertex Industries (VETX)

NO STOCK INDICATORS – we decided not use the indicators. We are looking for momentum movers and that why we only used the 100% Movers Method.

Vertex Stock Chart



• Vertex Industries Mathematical Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|----------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 9/19/00 | 14.7 | | | | |
| 9/20/00 | 13.8 | 0.93877551 | -0.063178902 | | |
| 9/21/00 | 12.9 | 0.934782609 | -0.067441281 | | |
| 9/22/00 | 13.6 | 1.054263566 | 0.052842481 | | |
| 9/25/00 | 13.3 | 0.977941176 | -0.022305758 | | |
| 9/26/00 | 13.9 | 1.045112782 | 0.044124805 | | |
| 9/27/00 | 15.8 | 1.136690647 | 0.1281211 | | |
| 9/28/00 | 16.6 | 1.050632911 | 0.049392755 | | |
| 9/29/00 | 18.3 | 1.102409639 | 0.097498364 | | |
| 10/2/00 | 18.5 | 1.010928962 | 0.010869672 | | |
| 10/3/00 | 17.7 | 0.956756757 | -0.044206093 | | |
| 10/4/00 | 16.5 | 0.93220339 | -0.070204259 | | |
| 10/5/00 | 14.8 | 0.896969697 | -0.1087332 | | |
| 10/6/00 | 17 | 1.148648649 | 0.138586163 | | |
| 10/9/00 | 16.8 | 0.988235294 | -0.011834458 | | |
| 10/10/00 | 18.1 | 1.077380952 | 0.074533052 | | |
| 10/11/00 | 17.1 | 0.944751381 | -0.056833475 | | |
| 10/12/00 | 15.9 | 0.929824561 | -0.072759354 | | |
| 10/13/00 | 16.3 | 1.025157233 | 0.024845999 | | |
| 10/16/00 | 16.8 | 1.030674847 | 0.030213779 | 0.07264002 | 139% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 32 |
| Time = | 0.29609328 |
| Sigma = | 1.3877856 |
| ((x) + Standard Deviation) = | 1 |
| ((x) - Standard Deviation) = | -1 |
| Current Price = | 16.8 |
| ((x) Forecasting + Move) = | 25.33 |
| ((x) Forecasting - Move) = | 11.13 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|------------|
| # Of Days 2 = | 32 |
| Time Probability = | 0.29609328 |
| Target Price = | 12 |
| Volatility = | -0.8188386 |
| Probability % will not hit Target Price | 21% |
| Probability % will hit Target Price | 79% |

5.1.10 - Green Mountain Coffee, Inc. (GMCR)

Green Mountain Coffee, Inc. is a holding company for its wholly owned subsidiary Green Mountain Coffee Roasters, Inc. Green Mountain Coffee Roasters, Inc. produces over 60 varieties of coffees, which are sold through wholesale and direct mail operations. The direct mail segment sells to consumers and small businesses through catalogs and through the company's online store – www.GreenMountainCoffee.com. The wholesale segment provides products to customers such as supermarkets, office coffee distributors, convenience stores, and restaurants.

Using the 100% Movers Strategy we came across Green Mountain Coffee, Inc. The stock price of Green Mountain Coffee had always remained at or around \$8 per share since the company went public in 1994. Since January 2000, Green Mountain Coffee stock started rapidly increasing. The stock had increased more than 100% since the beginning of the year. This led us to believe that Green Mountain Coffee would be a good purchase according to our short-term 100% Movers Strategy. During the past 5-years, 2-years, 1-year, 3-months and 1-month stock price performance had increased by 182%, 225%, 111%, 34% and 17% respectively. We decided not to use the stock indicators strategy for this trade.

On October 17th, 2000, we purchased 476 shares at \$21.00 per share for a total investment of \$9,996.00. The stock price had been rapidly climbing before this point, and continued to rapidly climb afterwards. When the stock price started to decrease we decided to sell the stock, because we did not want to lose our profit. After holding it for 21 days, we sold the stock on November 6th at \$30.63 per share. Our final result for this

trade was a profit of \$4,583.88, which represents a 45.8% profit. If we had held the trade until the end of the simulation, we would have sold it at \$39.25 per share, which would of represented an 87% profit! With the completion of this trade we were successful 4 out of 5 trades using the 100% Movers method. Also, we made more money on this trade compared to all other transactions that we made during our simulation.

Green Mountain Coffee's stock price increased quite a bit during the course of our simulation. This increase could have been caused by all the positive news reported about the company. First, the company met their quarterly earnings and sales. Then, Green Mountain Coffee signed a 5-year exclusive agreement with Exxon Mobil Corporation. Under the terms of the agreement, the coffee will be made available to an additional 500 corporately owned units in the Mid-Atlantic States and in other markets. Obviously this was a big win for Green Mountain Coffee.

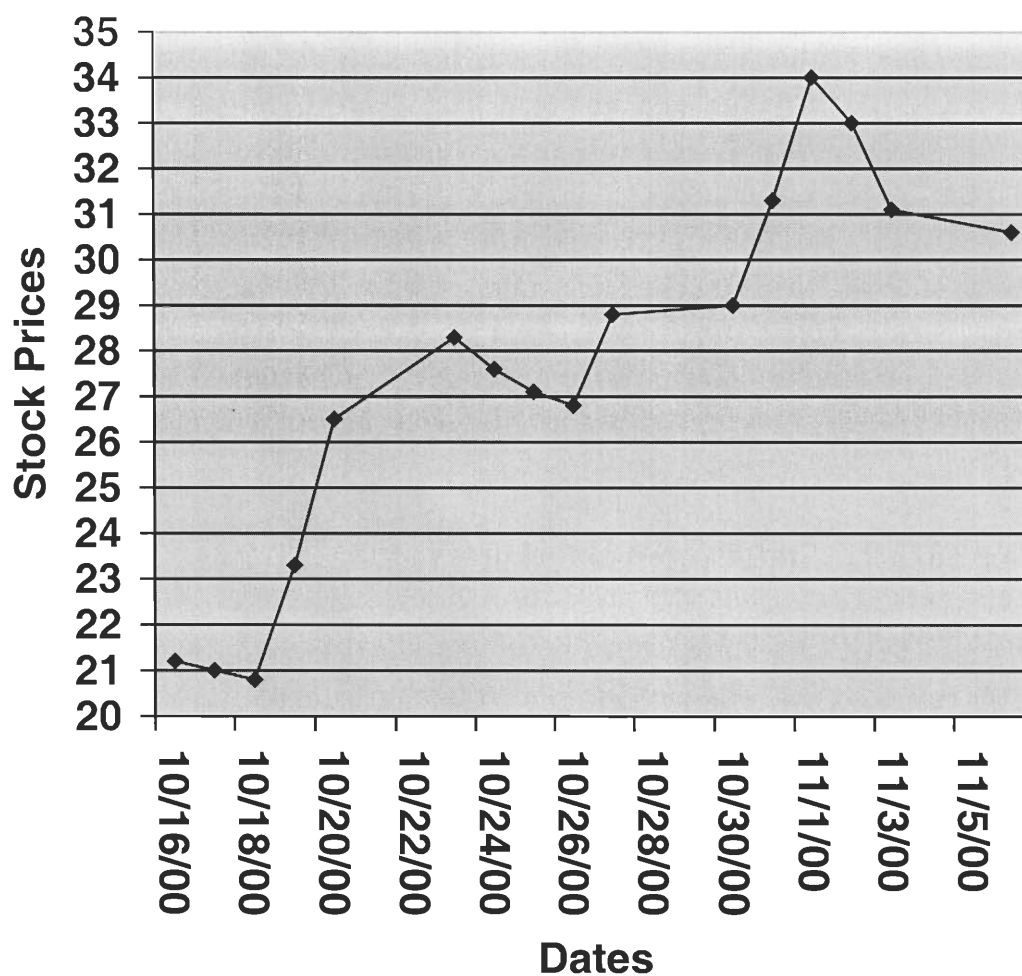
After our simulation was complete, we gathered all the necessary information we needed to compute our mathematical tool calculations. The day before we bought Green Mountain Coffee it was trading at \$21.20 per share. Our target price was \$30.63, which was the actual stock price when we sold the stock. The size of move based on volatility forecast yielded a range of \$19.20 to \$23.40. The actual result, \$30.63, came in far above the high end of the predicted range. The formula calculated that the probability that the target price would be achieved was 0%!



Green Mountain Coffee (GMCR)

NO STOCK INDICATORS – we decided not use the indicators. We are looking for momentum movers and that why we only used the 100% Movers Method.

Green Mountain Coffee Stock Chart



• Green Mountain Coffee, Inc. Mathematical Computations

Section 1: Data collection and Calculating the Volatility of (x) Standard Deviation.

| Date | Daily Price | Price / Previous Day | Log of Daily Price Change | Standard Deviation | Volatility (X) Stand. Dev. |
|----------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| | | | | | |
| 9/19/00 | 18.1 | | | | |
| 9/20/00 | 18.3 | 1.011049724 | 0.010989122 | | |
| 9/21/00 | 18.8 | 1.027322404 | 0.02695581 | | |
| 9/22/00 | 18.8 | 1 | 0 | | |
| 9/25/00 | 18.8 | 1 | 0 | | |
| 9/26/00 | 18.8 | 1 | 0 | | |
| 9/27/00 | 18.4 | 0.978723404 | -0.021506205 | | |
| 9/28/00 | 18.5 | 1.005434783 | 0.005420067 | | |
| 9/29/00 | 18.9 | 1.021621622 | 0.02139119 | | |
| 10/2/00 | 18.9 | 1 | 0 | | |
| 10/3/00 | 18.9 | 1 | 0 | | |
| 10/4/00 | 19 | 1.005291005 | 0.005277057 | | |
| 10/5/00 | 19 | 1 | 0 | | |
| 10/6/00 | 19.2 | 1.010526316 | 0.0104713 | | |
| 10/9/00 | 19.6 | 1.020833333 | 0.020619287 | | |
| 10/10/00 | 20.9 | 1.066326531 | 0.064219593 | | |
| 10/11/00 | 21.4 | 1.023923445 | 0.023641763 | | |
| 10/12/00 | 21.1 | 0.985981308 | -0.014117882 | | |
| 10/13/00 | 21.9 | 1.037914692 | 0.037213596 | | |
| 10/16/00 | 21.2 | 0.96803653 | -0.032485455 | 0.02155959 | 41% |

Section 2: Forecasting the size of a move based on Volatility.

| | |
|------------------------------|--------------|
| # Of Days 1 = | 21 |
| Time = | 0.23986297 |
| Sigma = | 0.4118953 |
| ((x) + Standard Deviation) = | 1 |
| ((x) – Standard Deviation) = | -1 |
| Current Price = | 21.2 |
| ((x) Forecasting + Move) = | 23.40 |
| ((x) Forecasting – Move) = | 19.20 |

Section 3: Calculating the probability that a target price will and will not be achieved.

| | |
|---|-------------|
| # Of Days 2 = | 21 |
| Time Probability = | 0.23986297 |
| Target Price = | 30.63 |
| Volatility = | 3.72453989 |
| Probability % will not hit Target Price | 100% |
| Probability % will hit Target Price | 0% |

5.2 – Stocks Researched but not Purchased

Throughout the course of this simulation, we researched many companies. In the simulation, we did not purchase every company that we researched. Some of the companies that we looked at did not seem to be “good buys” for a number of reasons. Our project isn’t concerned with what companies in particular are good or bad, so we will not go into great detail on companies that we didn’t purchase in our simulation. Still, our project would not be complete without some mention of the stocks that we **didn’t** buy. The companies that we researched and chose not to purchase are as follows:

Boeing
Coca Cola
Diagnostics Products
Dupont
Fuji Photo
General Electric
Honda
International Business Machines
Sony

5.2.1 - Boeing

The Boeing Company is a high profile aerospace corporation. The Company is split into three divisions: commercial airplanes, military aircraft and missiles, and space and communications. The Commercial Airplanes division develops, produces and markets of commercial jet aircraft and provides related support services to the commercial airline industry. The Military Aircraft and Missiles division is involved in the research, development, production, modification and support of military aircraft. The Space and Communications division is involved in the research, development, production, modification and support of space systems, rocket engines, information and battle management systems, and related systems.

We began to research the Boeing Company after learning that it was a recommended stock by Leckey's "50 Best Stocks" book. While the company's revenue per share, cash flow per share, and earnings per share were all on an upward trend; the company's other indicators were not as favorable. Boeing has a large debt, a negative 5-year earnings gain, and poor current and quick ratios. Combine these figures with a low 5-year sales gain and a small projected sales figure and we quickly determined that Boeing would not be a good buy.

Boeing Company (BA) Stock Indicators

Primary Indicators

| | |
|----------------------------------|--|
| Net Profit: | 4.3 % |
| Cash Assets: | \$2,628,000,000 |
| Total Debt: | \$6,590,000,000 |
| Sales/Revenue per Share: | \$55.72, trend up 3 out of 5, next 2 up. |
| Cash Flow per Share: | \$4.20, trend up 4 out of 5, next 2 up. |
| Earnings per Share (EPS): | \$2.49, trend up 4 out of 5, next 2 up. |
| 5 Year Sales Gain: | 8 % |
| 5 Year Earnings Gain: | -6.0 % |
| Projected Sales: | 5.0 % |
| Projected Earnings: | 19.0 % |
| Current Ratio: | 1.16 |
| Quick Ratio: | 0.19 |

Secondary Indicators

| | |
|---|-----------------------|
| Market Capital: | \$51,032,003,750 |
| 52 Week High/Low: | \$60.12 / \$32.00 |
| Sales: | \$51,679,000,000 |
| Dividend Yield: | 1.0 % |
| Insider Buy/Sell/Own: | 0 / 6 / 2.3 % |
| 5-Year Price Appreciation: | 42.2 % |
| Projected High/Low: | \$95 & \$65 |
| Timeliness/Safety: | 3/3 |
| Current Price to Earnings (P/E): | 23.7 |
| Average Price to Earnings: | 3.62, avg. P/E < P/E. |
| Price to Sales (P/S): | \$1.0 |
| Price to Book (P/B): | \$13.65 |
| Max/Min: | 140 % / 65 % |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.2.2 - Coca Cola

The Coca-Cola Company is the largest manufacturer, distributor and marketer of soft drink concentrates and syrups in the world. The Company also markets and distributes juice and juice-drink products. The company's beverage products are sold in nearly 200 countries and include the leading soft drink products in most of these countries. More than one billion servings of Coca-Cola beverages are consumed worldwide every day.

The stock indicators for Coca-Cola were almost totally negative. The company's debt was three times greater than its assets. The Sales per share was on an upward trend four out of the last five years, but the Cash Flow per Share and Earnings per Share were only on an upward trend for 2 or 3 out of the last five years. The Five Year Sales Gain was only 7% and the Five Year Earnings Gain was only 11.5%. The projected sales and earnings were both at a weak 7.5% and the Current and Quick ratios of .667 and .24 respectively were both poor. Obviously Coca-Cola would not be a "good buy" according to our stock indicator strategy.

Coca Cola (KO) Stock Indicators

Primary Indicators

| | |
|---------------------------|--------------------------------------|
| Net Profit: | 17.1 % |
| Cash Assets: | \$2,684,000,000 |
| Total Debt: | \$7,635,000,000 |
| Sales/Revenue per Share: | 8.08, trend up 4 out of 5, up next 2 |
| Cash Flow per Share: | 1.80, trend up 2 out of 5, up next 2 |
| Earnings per Share (EPS): | 1.45, trend up 3 out of 5, up next 2 |
| 5-Year Sales Gain: | 7 % |
| 5-Year Earnings Gain: | 11.5 % |
| Projected Sales: | 7.5 % |
| Projected Earnings: | 7.5 % |
| Current Ratio: | 0.667 |
| Quick Ratio: | 0.24 |

Secondary Indicators

| | |
|----------------------------------|-------------------|
| 52 Week High/Low: | \$69.0 & \$42.87 |
| Market Capital: | \$125,858,000,000 |
| Sales: | \$20,010,000,000 |
| Dividend Yield: | 1.3 % |
| Insider Buy/Sell/Own: | 1 / 4 / 8.1 % |
| 5-Year Price Appreciation: | 26.4 % |
| Projected High/Low | \$80 / \$65 |
| Timeliness/Safety: | 4 / 1 |
| Current Price to Earnings (P/E): | 51.84 |
| Average Price to Earnings: | 39.3 |
| Price to Sales (P/S): | 5.97 |
| Price to Book (P/B): | 3.85 |
| Max/Min: | 25 % / 5 % |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.2.3 - Diagnostic Products

Diagnostic Products develops, manufacture, and markets medical immunodiagnostic test kits and automated laboratory instruments. The company's products are used to obtain precise and rapid identification and measurement of hormones, drugs, viruses, bacteria, and other substances present in body fluids and tissues. Hospitals, clinics, veterinary facilities, research laboratories, forensic laboratories, and doctors' offices all use this company's products. The company's tests relate to a variety of diagnosis's, such as: thyroid disorders, anemia, reproductive disorders, diabetes, allergies, bone metabolism, infectious diseases, substance abuse, and certain types of cancer.

In terms of stock indicators, Diagnostic Products had some positive things going for it, but the negative far outweighed the positive. While the company did have an upward trend of Revenue per Share for the past five years, the Cash Flow and Earnings per share did not show such a trend. The company's debt was twice as much as it's assets. Diagnostic Products did have a nice Quick Ratio of 3.12 but the Current Ratio was only .20. The company's numbers in Five Year Sales and Earnings Gain and Projected Sales and Earnings were not terrible, but very impressive either. Based upon our stock indicator research, we decided not to purchase shares of Diagnostic Products as we felt that we could find other stocks that could better fit our purchasing criteria.

Diagnostic Products (DP) Stock Indicators

Primary Indicators

| | |
|----------------------------------|---------------------------------------|
| Net Profit: | 10.8% |
| Cash: | \$8.9 million |
| Total Debt: | \$16.8 million |
| Sales/Revenue per Share: | 18.5 (upward trend) |
| Cash Flow per Share: | 3.40 (down 97, up 98, down 99) |
| Earnings per Share (EPS): | 1.95 (down 96, down 97, up 98, up 99) |
| 5-Year Sales Gain: | 11% |
| 5-Year Earnings Gain: | 4% |
| Projected Sales: | 12.5% |
| Projected Earnings: | 13.5% |
| Current Ratio: | 3.12 |
| Quick Ratio: | .20 |

Secondary Indicators

| | |
|---|--------------------------------|
| Market Capital: | \$600 million |
| 52-Week High/Low: | 60.75 / 21.75 |
| Sales: | \$250 million |
| Dividend Yield: | 1.1% |
| Insider Buy/Own: | officers and directors own 25% |
| 5-Year Price Appreciation: | 14% |
| Projected High/Low: | 70/50 |
| Timeliness/Safety: | 1/3 |
| Current Price to Earnings (P/E): | 21.6 |
| Average Price to Earnings: | 20.16 |
| Price to Sales (P/S): | 2.76 |
| Price to Book (P/B): | 16.3 |
| Max/Min: | +65% / +15% |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.2.4 - Dupont

E.I. DuPont de Nemours is a global science and technology company with operations in high-performance materials, specialty chemicals, pharmaceuticals and biotechnology. The company is composed of approximately 80 businesses that manufacture and sell a wide range of products to many different markets, such as: transportation, textile, construction, automotive, agricultural, health, pharmaceuticals, packaging, and electronics. The company's strategic business units are divided into nine segments: Agriculture & Nutrition, Nylon Enterprise, Performance Coatings & Polymers, Pharmaceuticals, Pigments & Chemicals, Pioneer, Polyester Enterprise, Specialty Fibers and Specialty Polymers.

Dupont is another stock that was recommended by Leckey's "50 Best Stocks" book. Although recommended by Leckey, we elected not to purchase shares of Dupont after examining the company's stock indicators. The company had four times more debt than cash assets. The sales, earnings, and cash flow per share were all down from '97. Dupont's five-year earnings gain was a respectable 20% but the company's five-year sales gain was only 3.5%. The current ratio and quick ratio were both poor values (1.14 and .24 respectively) and the projected sales figure was only 3.5%. Since the company only had one positive stock indicator according to our strategy, we decided it would be best not to purchase the stock.

Dupont (DD) Stock Indicators

Primary Indicators

| | |
|----------------------------------|--|
| Net Profit: | 10.1% |
| Cash: | \$3.07 billion |
| Total Debt: | \$13.38 billion |
| Sales/Revenue per Share: | 29.15 (down from 97, but up from 98, 99) |
| Cash Flow per Share: | 4.7 (down from 97, but up from 98, 99) |
| Earnings per Share (EPS): | 2.95 (down from 97, but up from 98, 99) |
| 5-Year Sales Gain: | 3.5% |
| 5-Year Earnings Gain: | 20% |
| Projected Sales: | 3.5% |
| Projected Earnings: | 9% |
| Current Ratio: | 1.14 |
| Quick Ratio: | .24 |

Secondary Indicators

| | |
|---|-----------------------------|
| Market Capital: | \$46.1 billion |
| 52-Week High/Low: | 74 / 38.25 |
| Sales: | \$29.75 billion |
| Dividend Yield: | 3.2% |
| Insider Buy/Own: | officers/directors own 1.6% |
| 5-Year Price Appreciation: | 23% |
| Projected High/Low: | 90 / 75 |
| Timeliness/Safety: | -4/1 |
| Current Price to Earnings (P/E): | 14.9 |
| Average Price to Earnings: | 18 |
| Price to Sales (P/S): | 1.54 |
| Price to Book (P/B): | 14.75 |
| Max/Min: | +105%/70% |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.2.5 - Fuji Photo

Fuji Photo Film Co., Ltd. is a multinational manufacturer of photographic products. The Company conducts business in the following segments: Films and Imaging Systems, Digital Imaging Systems, Graphic Arts and Printing Systems, Medical Imaging and Diagnostic Systems, Recording Media, Office Imaging Information Systems, and Highly Functional Industrial Materials.

The decision whether or not to invest in Fuji was relatively close. The company had some good stock indicators. The company had very little debt in relation to its cash assets. Fuji's current and quick ratios of 2.82 and 1.68 respectively were both good numbers. The problem was that the company was on a downward swing in terms of revenue per share, earnings per share, and cash per share. Combine that with poor projected sales (3%) and very little sales and earnings gain over the last five years, and we decided that we could probably find better investments.

Fuji Photo (FUJIY) Stock Indicators

Primary Indicators

| | |
|----------------------------------|--|
| Net Profit: | 5.9% |
| Cash: | \$7.59 billion |
| Total Debt: | \$1.66 billion |
| Sales/Revenue per Share: | 25.65 (down from 99, but up from previous) |
| Cash Flow per Share: | 3.35 (down from 99, but up from previous) |
| Earnings per Share (EPS): | 1.50 (down from 99, but up from previous) |
| 5-Year Sales Gain: | 3.0% |
| 5-Year Earnings Gain: | .5% |
| Projected Sales: | 3.0% |
| Projected Earnings: | 6.5% |
| Current Ratio: | 2.82 |
| Quick Ratio: | 1.68 |

Secondary Indicators

| | |
|---|----------------|
| Market Capital: | \$19.6 billion |
| 52-wk High/Low: | 47.5 / 30.5 |
| Sales: | \$13.2 billion |
| Dividend Yield: | .5% |
| Insider Buy/Own: | Unknown |
| 5-Year Price Appreciation: | 15% |
| Projected High/Low: | 60 / 45 |
| Timeliness/Safety: | 4/2 |
| Current Price to Earnings (P/E): | 24.8 |
| Average Price to Earnings: | 25.5 |
| Price to Sales (P/S): | 1.32 |
| Price to Book (P/B): | 27.8 |
| Max/Min: | +60%/20% |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.2.6 - General Electric

General Electric is one of the largest and most diversified industrial corporations in the world. GE's products include appliances, lighting products, aircraft engines and plastics. GE also provides television, cable, internet, distribution, engineering and financial services.

General Electric had many positive stock indicators. The company had a high net profit; upward trends for revenue, cash flow, and earnings per share; a good quick ratio; and good numbers for 5-year earnings and projected earnings. On the other hand, the company had some negative stock indicators as well. Most importantly, the company had a huge debt of \$197 billion, far outweighing the company's \$3.6 billion in cash assets. It is this huge debt that caused us to stay away from General Electric.

General Electric (GE) Stock Indicators

Primary Indicators

| | |
|----------------------------------|---|
| Net Profit: | 19.4 % |
| Cash Assets: | \$3,594,000,000 |
| Total Debt: | \$197,340,000,000 |
| Sales/Revenue per Share: | \$6.45, trend up past 5 years, next 2 up. |
| Cash Flow per Share: | \$1.50, trend up past 5 years, next 2 up. |
| Earnings per Share (EPS): | \$1.25, trend up past 5 years, next 2 up. |
| 5-Year Sales Gain: | 5.5 % |
| 5-Year Earnings Gain: | 13 % |
| Projected Sales: | 8.5 % |
| Projected Earnings: | 16.0 % |
| Current Ratio: | 1.9 |
| Quick Ratio: | 1.8 |

Secondary Indicators

| | |
|---|------------------------|
| 52-Week High/Low: | \$60.50 / \$38.20 |
| Sales: | \$58,219,000,000 |
| Dividend Yield: | 0.9 % |
| Insider Buy/Sell/Own: | 3 / 19 / 1.0 % |
| 5-Year Price Appreciation: | 389 % |
| Projected High/Low: | \$60 & \$50 |
| Timeliness/Safety: | 2 / 1 |
| Current Price to Earnings (P/E): | 51.8 |
| Average Price to Earnings: | 25.16, Avg. P/E < P/E. |
| Market Capital: | \$591,451,000,000 |
| Price to Sales (P/S): | \$4.58 |
| Price to Book (P/B): | \$12.73 |
| Max/Min: | 15 % / -5 % |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.2.7 - Honda Motor

Honda Motor Co., Ltd. Manufactures, distributes, and provides financing for the sale of its motorcycles, automobiles, and other products. Although mostly known for their automobile business, Honda also manufactures portable generators, small general-purpose engines, lawn mowers, tractors, power tillers, outboard engines and four-wheeled all-terrain vehicles (ATVs). Last year, 80.1% of Honda's consolidated net sales came from its automobile business.

A cursory examination of the company's stock indicators quickly showed that Honda was not a company that we want to purchase according to our stock indicator strategy. Aside from an impressive 43% 5-year earnings gain, the company had no positive stock indicators. Honda's debt was more than three times the amount of its cash assets. The company had no positive trends for revenue, cash flow, or earnings per share. The current and quick ratios were both poor. The projected sales and projected earnings values were mediocre at best.

Honda Motor (HMC) Stock Indicators

Primary Indicators

| | |
|----------------------------------|--|
| Net Profit: | 4.3% |
| Cash: | \$4.1 billion |
| Total Debt: | \$13.5 billion |
| Sales/Revenue per Share: | 120.1 (up trend, but projected down in 01) |
| Cash Flow per Share: | 7.70 (down in 00 but up from past years) |
| Earnings per Share (EPS): | 4.5 (down from previous two years) |
| 5-Year Sales Gain: | 5.5% |
| 5-Year Earnings Gain: | 43% |
| Projected Sales: | 4.5% |
| Projected Earnings: | 4.5% |
| Current Ratio: | 1.12 |
| Quick Ratio: | .20 |

Secondary Indicators

| | |
|---|----------------|
| Market Capital: | \$34.1 billion |
| 52-week High/Low: | 90.75 / 64.5 |
| Sales: | \$58.5 billion |
| Dividend Yield: | .6% |
| Insider Buy/Own: | Unknown |
| 5-Year Price Appreciation: | 77% |
| Projected High/Low: | 125/85 |
| Timeliness/Safety: | 4 / 3 |
| Current Price to Earnings (P/E): | 15.6 |
| Average Price to Earnings: | 17.36 |
| Price to Sales (P/S): | .63 |
| Price to Book (P/B): | 38.5 |
| Max/Min: | +80%/+20% |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.2.8 - IBM

IBM, short for International Business Machines provides customer solutions through the use of advanced information technology such as: systems, products, services, software, and financing. IBM's organization is composed of several segments: hardware products, personal systems and servers, global services, software, global financing, and an enterprise investment segment.

The decision to not invest in IBM was a difficult one to make. The IBM Corporation had a lot going for it. The company's revenue, cash flow, and earnings per share were all on upward trends for the past five years, and these trends should continue into the foreseeable future. The 5-year sales and 5-year earnings gains were both excellent, as were the figures for projected sales and earnings. On the other hand, the company had poor figures for current and quick ratios. Also, IBM had a huge debt; nearly ten times that of its cash assets. In the end, this caused us to decide that there are probably better companies to invest in.

International Business Machines (IBM) Stock Indicators

Primary Indicators

| | |
|----------------------------------|----------------------|
| Net Profit: | 8.5% |
| Cash: | \$3.6 billion |
| Total Debt: | \$28.1 billion |
| Sales/Revenue per Share: | 53.15 (upward trend) |
| Cash Flow per Share: | 7.6 (upward trend) |
| Earnings per Share (EPS): | 4.35 (upward trend) |
| 5-Year Sales Gain: | 10% |
| 5-Year Earnings Gain: | 40% |
| Projected Sales: | 13% |
| Projected Earnings: | 17% |
| Current Ratio: | .619 |
| Quick Ratio: | .06 |

Secondary Indicators

| | |
|---|-------------------------------------|
| Market Capital: | \$186 billion |
| 52-Week High/Low: | 135 / 89.75 |
| Sales: | \$93 billion |
| Dividend Yield: | .5 |
| Insider Buy/Own: | officers/directors own less than 1% |
| 5-Year Price Appreciation: | 327% |
| Projected High/Low: | 180/130 |
| Timeliness/Safety: | 3/2 |
| Current Price to Earnings (P/E): | 24.1 |
| Average Price to Earnings: | 16.4 avg P/E < current P/E |
| Price to Sales (P/S): | 2.3 |
| Price to Book (P/B): | 13.15 |
| Max/Min: | +70%/+25% |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.2.9 - Sony Corporation

Sony Corporation develops, designs, manufactures and sells electronic equipment, instruments and devices for consumer and professional markets. In addition, Sony Corporation is engaged in a variety of other business operations through Sony Computer Entertainment, Sony Music Entertainment, Sony Pictures Entertainment, and Sony Life Insurance. Sony is also involved in leasing and credit financing, Internet-related businesses, location-based entertainment complexes and other businesses.

We decided not to invest in Sony Corporation because the company's stock indicators were poor. The company's debt was nearly twice as much as its cash assets. Sony's cash flow and earnings per share both had downward trends in 1999. The company's quick and current ratio both had mediocre values. The company did have some positive stock indicators going for it, such as its revenue per share, 5-year earnings gain, and project earnings. Although the company does have some positive stock indicators, we felt that we could find other companies that would better fit our stock indicator strategy.

Sony Corporation (SNE) Stock Indicators

Primary Indicators

| | |
|----------------------------------|--|
| Net Profit: | 2.3% |
| Cash: | \$6.5 billion |
| Total Debt: | \$10.8 billion |
| Sales/Revenue per Share: | 77.95 (upward trend) |
| Cash Flow per Share: | 5.60 (upward trend but 99 down from 98) |
| Earnings per Share (EPS): | 1.40 (upward trend but 99, 98 were down) |
| 5-Year Sales Gain: | 6.0% |
| 5-Year Earnings Gain: | 39.5% |
| Projected Sales: | 9.0% |
| Projected Earnings: | 19% |
| Current Ratio: | 1.36 |
| Quick Ratio: | .30 |

Secondary Indicators

| | |
|---|----------------|
| Market Capital: | \$87 billion |
| 52-Week High/Low: | 157.5 / 71.5 |
| Sales: | \$65.5 billion |
| Dividend Yield: | .2% |
| Insider Buy/Own: | Unknown |
| 5-Year Price Appreciation: | 163% |
| Projected High/Low: | 160/105 |
| Timeliness/Safety: | 4 / 3 |
| Current Price to Earnings (P/E): | 80 |
| Average Price to Earnings: | 29.4 |
| Price to Sales (P/S): | 1.44 |
| Price to Book (P/B): | 23.6 |
| Max/Min: | +70%/+10% |

- Blue lettering rating: okay to good.
- Red lettering rating: okay to not so good/bad

5.3 – Stock Transactions

| Date At Buy | Company | Ticker | Buy Price | Quantity Of Shares | Date At sold | Sell Price | Total \$ Spent at Buy | Total \$ Received at Sell | Profit / (Loss) |
|----------------|-------------------|--------|--------------|--------------------------|-----------------|---------------|-----------------------------|---------------------------------|--------------------|
| 9/18/2000 | Intel Corp. | INTC | \$58.37 | 171 | 11/17/2000 | \$41.50 | \$9,981.27 | \$7,096.50 | (\$2,884.77) |
| 9/18/2000 | Cisco Systems | CSCO | \$61.56 | 162 | 11/17/2000 | \$52.75 | \$9,972.72 | \$8,545.50 | (\$1,427.22) |
| 9/26/2000 | Wal-Mart | WMT | \$49.44 | 202 | 11/15/2000 | \$49.00 | \$9,986.88 | \$9,898.00 | (\$88.88) |
| 9/26/2000 | Emc Corp. | EMC | \$102.25 | 97 | 11/17/2000 | \$84.88 | \$9,918.25 | \$8,233.36 | (\$1,684.89) |
| 10/4/2000 | Four Season | FS | \$75.68 | 132 | 11/17/2000 | \$65.44 | \$9,989.76 | \$8,638.08 | (\$1,351.68) |
| 10/10/2000 | Elantec Semi. | ELNT | \$83.50 | 119 | 10/31/2000 | \$111.25 | \$9,936.50 | \$13,238.75 | \$3,302.25 |
| 10/12/2000 | Harley Davidson | HDI | \$43.50 | 229 | 11/10/2000 | \$47.17 | \$9,961.50 | \$10,806.51 | \$845.01 |
| 10/17/2000 | MetLife | MET | \$25.75 | 388 | 11/10/2000 | \$29.88 | \$9,991.00 | \$11,593.44 | \$1,602.44 |
| 10/17/2000 | Vertex Industries | VETX | \$16.81 | 594 | 11/17/2000 | \$12.00 | \$9,985.14 | \$7,128.00 | (\$2,857.14) |
| 10/17/2000 | Green Mountain | GMCR | \$21 | 476 | 11/6/2000 | \$30.63 | \$9,996.00 | \$14,579.88 | \$4,583.88 |

\$39.00

5.4 – Options Transactions

| Date At Buy | Company | Ticker | Calls/ Puts | Strike Price | Actual Stock Price @ Buy | Buy Ask Price | # Of Contracts | # Of Shares | Date At Sold | Actual Stock Price @ sell | Sell Ask Price | Total \$ At Buy | Total \$ At Sell | Profit / (Loss) |
|----------------|---------------|--------|----------------|-----------------|-----------------------------------|------------------|-------------------|----------------|-----------------|------------------------------------|-------------------|--------------------|---------------------|--------------------|
| 9/26/00 | Intel Corp. | INTC | Nov.-C | \$45 | \$43.31 | \$3.38 | 5 | 500 | 11/17/00 | \$40.00 | 1/16 | \$1,690 | \$31.25 | (\$1,658.75) |
| 10/4/00 | Emc Corp. | EMC | Nov.-C | \$90 | \$92.13 | \$9.50 | 2 | 200 | 11/17/00 | \$84.13 | \$0.25 | \$1,900 | \$50.00 | (\$1,850.00) |
| 10/30/00 | Elantec Semi. | ELNT | Nov.-C | \$85 | \$96.56 | \$17.50 | 1 | 100 | 10/31/00 | \$111.25 | \$29.13 | \$1,750 | \$2,913 | \$1,163 |
| 10/30/00 | Emc Corp. | EMC | Nov.-C | \$80 | \$84.44 | \$8.38 | 2 | 200 | 10/31/00 | \$89.06 | \$11.50 | \$1,675 | \$2,300 | \$625 |
| 10/31/00 | MetLife | MET | Nov.-C | \$25 | \$27.63 | \$2.94 | 6 | 600 | 11/9/00 | \$29.69 | \$3.38 | \$1,764 | \$2,028 | \$264 |

(\$1,456.75)

Chapter 6 - Conclusion

Our group started with a sum of \$110,000 of play money. Our plan was to purchase 10 stocks and 5 options over a nine-weeks. For each stock we allocated a maximum of \$10,000, and for each option we allocated a maximum of \$2000. In the end, we had invested \$108,498.02 out of the possible \$110,000. Our simulation was nine weeks in length, running from September 18th, 2000 to November 17th, 2000.

Our goal was to make a profit of 17.3% in nine weeks, which would represent a profit of 100% if projected over the course of a year. We did not meet our goal; instead we lost 1.29% of our original investment. At the end of our simulation, our beginning balance had fallen from \$108,498.02 to \$107,080.27, a loss of \$1,418.75.

One factor that may have influenced our simulation is that we started this simulation in a bear market. During the nine-week period, all three major indexes had lost value. The DOW, NASDAQ, and S&P500 were all down 1.65%, 18.79% and 5.32% respectively. Since the beginning of the year, the DOW, NASDAQ and S&P500 had all lost value of 6.41%, 26.72% and 6.01% respectively. NASDAQ was the biggest loser over the nine-weeks and during the past year as it represents high-tech companies, where the major players like Intel and Cisco did not perform as well as expected. Unfortunately, we had invested almost \$10,000 in each of those companies plus an additional \$2,000 in Intel options.

After extensive preparation and research, we were disappointed to find that we had lost money on each of our first five trades. We found our losses a bit surprising because the four out of the five companies were undeniable leaders in their industries. Intel, Cisco, EMC and Wal-Mart are all trends setters, and when the market's started to lose value these companies led the way down. With Intel, Cisco, EMC and Wal-Mart, we lost 28.9%, 14.31%, 16.99% and 0.89% respectively. Wal-Mart was the only company that did not take a huge loss. The only non-market leader that we purchased was Four Season Hotel and Resorts. At first, Four Seasons held it's value, but by the end of our simulation it had fallen to \$65.44, representing a 13.53% loss.

Our first two option trades were failures as well. We bought option contracts on Intel and EMC, which resulted in a loss of 98.15% and 97.37% respectively. On these two trades, we retained only \$81.25 of our original investment of \$3,590. These two trades were our biggest mistakes in our simulation. We should have sold these option contracts two weeks prior, because option contracts tend to rapidly decrease in value as their expiration dates approach. Instead, we held on to the contracts, naively hoping that each stock would rise a little more so that we could make a slight profit. If we had sold the contracts two weeks prior to the expiration dates we would have broken even with EMC and would have only lost 28% with Intel.

After our dismal start, in which we lost 14.92% in our first five trades, we decided to try a different strategy. We began using the 100% Movers Strategy, and made a profit on four out of our last five trades. The results for HDI, ELNT, MET, GMCR and VETX were +8.48%, +33.23%, +16.04%, +45.86% and -28.61% respectively. Using the 100% Movers Strategy, VETX was the only company that did not perform as well as we

expected. Our last five stock trades combined to make a 14.99% profit. Our last three option trades were profitable as well. ELNT, EMC and MET made 66.46%, 37.31% and 14.97% respectively, combining to represent a profit of 39.55%.

When we first started researching for this project, our focus was on stock indicators. Our strategy was to invest in the stock or option only if most of the indicators were respectable. The flaw in our logic was that we were using a strategy that works best for long-term investing. Our strategy for our simulation should have been based on short-term investing. We do believe that using the stock indicators gives invaluable insight to a company's financial stability. However, for short-term investments, a momentum based strategy like the 100% Movers Strategy seems more effective. The effectiveness of the 100% Movers Strategy is evident in the second half of our simulation.

There is no doubt in our minds that we could yield much better results if we were to run another simulation. Although we lost 1.29% of our investment during the course of the simulation, we did manage to beat all three major markets. The DOW, NASDAQ and S&P500 lost 1.65%, 18.79% and 5.32% respectively. We are pleased that we have beaten the major indexes and almost made a profit in the middle of a bear market. If we were to run another simulation, we feel that we could beat all three major indexes by at least 10%.

While running the simulation, we researched and implemented a mathematical tool. As each trade was complete, we gathered all the necessary data required by the mathematical tool to calculate a predicted range and probability of hitting the strike price. The mathematical tool had no bearing on our stock choices. We were only concerned in

researching how accurate the tool was. Accuracy was measured in two areas: range and probability. If the actual result fell within the mathematical tool's predicted range, we considered that a successful prediction. If the mathematical tool yielded a probability of at least 40%, we considered that a successful prediction.

• Mathematical Computation Results:

| Name of Company | Target Price | Range | Range predicted (Y/N) | Probability % that will / will not be achieved | Probability Predicted (Y/N) |
|--------------------------------|--------------|---------------------|-----------------------|--|-----------------------------|
| Cisco | \$52.75 | \$50.54 to \$78.01 | Yes | 79% / 21% | Yes |
| Intel 1 st | \$41.50 | \$45.88 to \$72.06 | No | 93% / 7% | Yes |
| Intel 2 nd Option | \$41.50 | \$27.93 to \$73.78 | Yes | 57% / 43% | Yes |
| Wal-Mart | \$49.00 | 441.90 to \$58.23 | Yes | 52% / 48% | Yes |
| Emc 1 st | \$84.88 | \$80.82 to \$126.21 | Yes | 78% / 22% | Yes |
| Emc 2 nd Option | \$84.13 | \$74.31 to \$118.89 | Yes | 67% / 33% | Yes |
| Emc 3 rd Option | \$89.06 | \$82.37 to \$89.77 | No | 21% / 79% | No |
| Four Season Hotel | \$65.44 | \$58.44 to \$94.89 | Yes | 70% / 30% | Yes |
| Elantec 1 st | \$111.25 | \$74.39 to \$113.03 | Yes | 18% / 82% | No |
| Elantec 2 nd Option | \$111.25 | \$88.65 to \$105.25 | No | 5% / 95% | No |
| Harley-Davidson | \$47.17 | \$42.17 to \$51.26 | Yes | 44% / 56% | Yes |
| MetLife 1 st | \$29.88 | \$22.10 to \$29.18 | No | 12% / 88% | No |
| MetLife 2 nd Option | \$29.69 | \$24.69 to \$29.20 | No | 12% / 88% | No |
| Vertex Industries | \$12.00 | \$11.13 to \$25.33 | Yes | 79% / 21% | Yes |
| Green Mountain Coffee | \$30.63 | \$19.20 to \$23.40 | No | 0% / 100% | No |

For the range segment, the mathematical computation predicted 10 out of 15 actual events, which represent an accuracy of 67%. As for the probability segment, the mathematical tool accurately predicted 9 out of 15 actual events, which represents an accuracy of 60%. If we consider only the stocks and options that lost value, the mathematical computation for the range accurately predicted 7 out of 8 (87.5%) events and the probability was accurate in all 8 events. If we consider only the stocks and options that we made a profit on, the mathematical computation for the range accurately predicted 3 out of 7 events, an accuracy of 42.8%. It is worth noting that 3 out of the 4 that did not fall in the range fell just outside the range. The mathematical computation for the probability accurately predicted only 1 out of the 7 events that we made a profit on, representing an accuracy of 14.3%. The mathematical tool was much more accurate with trades that lost value. The obvious conclusion is that the mathematical tool tends to predict that stocks will lose value.

Our project can be summed up with four major concepts: Stock Indicator Strategy, 100% Movers Strategy, option strategy, and the mathematical tool. The Stock Indicator Strategy was our original investment strategy. The 100% Movers Strategy was our second strategy, which focused on short-term investing. Option strategy is concerned with details specific to option trading. Finally, the mathematical tool is an attempt to use mathematical formulas to predict stock performance.

Before we began our simulation, we conducted research into how professional investors pick their stocks. After extensive research, we came up with our Stock Indicator Strategy. Although the strategy wasn't very successful for us, we feel that the Stock Indicator Strategy is a powerful one that should be used. It is a known fact that a

company's financial stability is important for long term investing. The primary downfall to the Indicator Strategy is that its very time consuming. If you wanted to build a 20-company portfolio it would take some time and a few aspirins.

The 100% Movers Strategy was by far the most effective method of investment that we used during our simulation. With this method we overcame huge losses to a more reasonable loss. We highly recommend this method to anyone who is thinking about trading stocks. The 100% Movers Strategy is our preferred trading method because it is fairly simple and very effective. This strategy can be even more effective when you have access to additional trading tools such as "stop losses," which would have prevented some of our losses had we used it during our simulation.

Experimenting with stock options is very interesting as small investments have the potential to make a bundle of money over night, as was the case for two of our trades. On the other hand, we lost practically our entire investment in two other trades. With options we learned that we needed to protect ourselves better. One suggestion would be to make sure to buy an option contract with at least two months before it will expire, although the further out you buy an option contract, the more it will cost. Also, it is important to sell your option contracts before they reach their expiration date, as the option price will quickly decay as the expiration date approaches.

The mathematical tool is a set of formulas that we used to attempt to predict the behavior of stocks. Unfortunately, we found that this tool did not work as well as we expected. One explanation for this failure could be that we really didn't understand the entire aspect of the mathematics. We suggest to any future projects that are done in the

future to try and use this tool. Perhaps a future group will be able to better understand something that we could not.

We have done our best to present an interesting and informative project. It is possible that we tried to cover too much information and perhaps we should have focused on only one or two concepts. We hope that by presenting various trading strategies and concepts this project has made the reader into a more rounded trader, we know that we are more rounded because of it.

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