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STOCK MARKET SIMULATION

An Interactive Qualifying Project Report

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by

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Abstract

In this project, we examined the stock market and performed a real-time stock investment simulation. In-depth research and detailed analysis enabled us to gain factual knowledge, learn effective investment strategies and develop the confidence to invest in the future.

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1 INTRODUCTION

1.1 Introduction and Project Objectives

The stock market is a colossal, highly complex and detailed network of cash "stock" and flow. The New York Stock Exchange itself handles an average daily trading volume of over 200 million shares. The market has a grand total value of over six trillion dollars. It seems capricious to think about trying to predict the actions of this wild beast. On the other hand, the market is very real, and most certainly displays realistic behaviors. In this simulation, we will try to make money to the best of our ability. We will implement various market strategies and experiment with investing. After careful research, we will invest 300,000 dollars into 15 or more companies, and based on technical analysis and market conditions, we will adjust our portfolio to achieve maximum profit. Our objective from this project is to gain factual knowledge, learn effective investment strategies, and develop a confidence for possible future investing.

The project is broken down into four stages; research, strategy development, real-time simulation, and analysis. In Chapter 1 and Chapter 2, we overview the general historical and technical background involved with the stock market. Then in Chapter 3, we discuss strategies and tools that we made use of during our simulation. We go on to an in-depth analysis in Chapter 4, and conclude with a general overview of successes, failures, and lessons in Chapters 5 and 6.

1.2 Stock Market History

1.2.1 How the Stock Market Began

Stock trading in the United States can be traced back over 200 years. When the American Revolution started, the Colonial Government needed capital to pay for the war. At this same time, banks started selling shares of their companies to people in order to raise money. Wall Street at the time was becoming this country's center for finance. In 1792, twenty-four merchants signed an agreement that started the New York Stock Exchange (NYSE) and agreed to meet everyday at that particular place on Wall Street to trade stocks and bonds (this later became known as securities trading). The Bank of New York was the first corporate stock traded. A stock is a certificate stating you own a fraction of a company.

Shortly after gold was discovered in California in 1849, new settlers in the west created a great demand on companies to expand very quickly. Our nation was small but growing rapidly. Companies needed a way to get lots of cash to help meet the demand. These companies knew investors would pay them large sums for a share in the profits or part ownership in their company. Many merchants decided to incorporate and issue stock to raise money for their needed growth.

By 1900, millions of dollars worth of stocks were being traded in mines, farm equipment, life insurance, printing, textiles, and railroads -- right out on the street. The streets got so crowded that some brokers moved their clerks to windows above the street. The clerks would take customers orders by telephone, then call them down to their brokers. But this only added to the noise. Soon, hand signals began to be used. They worked perfectly in all that noise. Then, so that the clerks could find them easily in the

crowd, brokers began to wear brightly colored hats and jackets. In 1921, finally, the curb market finally moved indoors.

The early 1900s also saw incredible changes in the United States. The Industrial Revolution had everyone wanting a piece of the profits companies were making. However, people came to realize that big profits could be made by simply selling their shares in a company to other people who saw great value or potential in that company. This trading became known as the secondary market. If everyone who bought stock simply kept it and waited to collect dividends, there would be no secondary market. The main reason for buying stock, however, is speculation. The secondary market does not affect a company at all. However, companies greatly affect the secondary market. If a company announced lay offs or record sales, people either sold their shares or bought more. To help people make theses purchases, a market place was needed where other investors (speculators) could gather. This is where the NYSE came to help.

Even though the NYSE is the biggest and best know stock market, it is not the only one in New York. The American Stock Exchange is also in New York and sells stocks. There are stock exchanges in Chicago, Los Angeles, San Francisco, Boston, Philadelphia, and Cincinnati. Each stock market specializes in a particular area. The reason the NYSE is so well known and largest is the fact they only trade in the very large and well-established companies. In fact, many companies not deemed good enough to be traded by them were once traded outside on the curb on Wall Street. That market once called "curb trading" eventually became the American Stock Exchange (AMEX).

Wealthy individuals were the first to catch on to trading stocks. However, what the common person came to realize was that stocks were a good investment over time

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and much less expensive than owning land or a house. In addition, what these investors knew was that that their money was being put to good use. The company shares they purchased today would one day be worth more than what they paid. When you buy a stock, you are actually paying for a small percentage of everything that the company owns.

Like any good businessperson, investors hoped to buy low and sell high, and thus profit from their investments. Supply and demand kept prices in check. If the supply for a stock was high and many people were trying to sell it, the price for that stock would drop. However, if the demand was high and the supply was low the price would rise.

1.2.2   Significant Stock Market Crashes of the 20th Century

1903

The first stock market crash of the twentieth century occurred in 1903. According to the Dow Jones index, the market dropped more than 16% by October. Although the crash represented a large fall in stock prices, there resulted little financial instability in the economy thereafter.

1920

Following WWI, the stock market crashed in 1920. Although the impact was spread over a long period of time, it was quite large. For the twelve months ending December 1920, the Dow Jones fell more than 30%. Bank failures increased substantially due to declining asset values nationwide. The crash led to a moderate economic recession.

1929

Known as the most infamous crash in stock market history, the crash of October 1929 was one of the sharpest and most abrupt collapses. The Dow Jones fell a total of 24% in a two-day period. The "roaring twenties" ended with a devastating crash, which led to the Great Depression, lasting almost a decade.

1969-1970

After the market had peaked in November 1968, it began a downward trend. Then there was a steep, abrupt decline in May 1970. Eventually the market hit bottom in June 1970 with a total drop of over 30%.

1973-1974

This stock market crash was both one of the longest and one of the largest. Over a twelve-month period the Dow Jones and the S&P 500 dropped 30.4% and 36.8% respectively. This crash led to a significant recession lasting through 1975.

1987

The October 1987 crash had the largest single-day decline in stock market values in U.S. history. The Dow Jones fell 22.6% on October 19th.

2   GENERAL BACKGROUND

In this section, we introduce the general background and information about the stock market and its operation.

2.1   Stock Market Terminology – Definitions

Before jumping into in-depth discussion and strategies involved with the stock market, important terms and jargon associated with it must be defined. Below is a list of terms that are essential to any discussion:

Bear
An investor who believes a stock or the overall market will decline. A bear market is a prolonged period of falling stock prices, usually by 20% or more.

Beta
A coefficient measuring a security's relative volatility. The beta is the covariance of a stock in relation to the rest of the stock market. For example, the Standard & Poors' (S&P) 500 Stock Index has a coefficient of 1. Any stock with a Beta greater than 1 is more likely to rise and fall with more volatility than the general market, and a Beta of less than 1 is more likely to rise and fall with less volatility than the general market.

Book Value
A company's book value is its total assets minus intangible assets and liabilities, such as debt. A company's book value might be more or less than its market value.

Bottom Line
Net income or earnings per share found at the bottom of the quarterly or annual income statement.

Bull
One who believes the market will rise. A bull market is a prolonged period of rising stock prices, usually by 20% or more.

Capital Gain
Profit earned on the sale of securities, either through dividends or by selling the securities at a higher price than they originally cost.

Commission
A brokers basic fee for purchasing or selling securities as an agent.

Day Order
An order to buy or sell which, if not executed, expires at the end of the trading day on which it was entered.

Day Trading
Refers to establishing and liquidating the same position or positions within one day's trading.

Dividend
The payment designated by the Board of Directors to be distributed pro rata among the shares out-standing. For preferred shares, the dividend is usually a fixed amount. For common shares, the dividend varies with the fortunes of the company and the amount of cash on hand, and may be omitted if business is poor or if the directors determine to withhold earnings to invest in plants and equipment. Sometimes a company will pay a dividend out of past earnings even

	if it is not currently operating at a profit.
Gap	Technical term used to describe the action in the price of a stock when it opens lower or higher than its previous close by a significant percentage.
Index	Indicators of trends in the markets, sections of the economy, or other economic indicators, such as precious metals or Treasuries. Some of the most common indices include the Dow Jones Industrial Average, the NASDAQ Composite, and the S&P 500.
Initial Public Offering	An issue of new stock by a once private company to transform itself into a publicly held one. IPO's are usually done to raise cash for growing young companies that need larger sources of capital than the private sector can provide. The new shares are sold to one or more investment banks, which then sell them to the public.
Insider	Someone who has information which, if made public, would likely influence the price of a stock. Also defined as, someone with at least 10% ownership, a company officer, or a company director.
Interest Rate	An important economic indicator. The price, calculated as a percentage of the money loaned, that banks are charging borrowers for the use of the banks' money.
Locked Market	A market is locked if the bid price equals the ask price
MACD	An indicator used in technical analysis. MACD is a moving average convergence/divergence. In simple terms, it is used to gauge the strength of a stock's move. It determines the balance of power between the bulls and bears
Market Capitalization	Also known as market cap, this is the price per share times the number of shares outstanding.
Momentum	Refers to a company's technical price momentum or fundamental earnings momentum. Companies with strong momentum have prices and earnings that are going up, while companies with weak momentum have prices and earnings that are going down, or going nowhere.
NYSE	Founded in 1792, the New York Stock Exchange (NYSE) is the largest and oldest exchange in the United States. It is located on Wall Street in New York City and trades more than 2,000 common and preferred stocks.
Overbought	Refers to a stock that has risen sharply in price or to the market as a whole after a period of vigorous buying which, it is sometimes said, has left prices "too high".
Oversold	Refers to a stock that has fallen sharply in price or to the market as a whole when it appears to have declined to an unreasonable level from vigorous selling.
Over-The-Counter Stocks (OTC)	Stocks traded on the NASDAQ and other Over-the-Counter (OTC) markets. The over-the-counter market is conducted over the telephone and computer and deals mainly with stocks of companies without sufficient shares, stockholders, or earnings to warrant listing

	on an exchange.
Price/Earnings to Growth Ratio (PEG)	A ratio used to determine a stock's value while taking into acouunt earnings growth. The PEG ratio is found by dividing the P/E ratio by the annual EPS growth.
Price-To-Earnings Ratio (P/E)	A ratio to evaluate a stock's worth. It is calculated by dividing the stock's price by an earnings-per-share figure. If calculated with the past year's earnings, it is called the trailing P/E. If calculated with an analyst's forecast for next year's earnings, it is called a forward P/E. Also called the P/E ratio or multiple.
Resistance	A price level with which as stock has difficulty rising above. This can indicate a concentration of supply at this price level, whereby an uptrend may have a strong possibility to hold or reverse itself. See Support.
SEC	The Securities and Exchange Commission, the primary federal regulatory agency of the securities industry.
Shares Outstanding	The number of authorized shares in a company that are held by investors, including employees and executives of that company. Unissued shares or treasury shares are not included in this figure.
SOX	Also known as the Philadelphia Semiconductor Index. It is a price-weighted index made up of 16 U.S. semiconductor companies primarily involved in the design, distribution, manufacture and sale of semiconductors. It's a closely watched index of the semiconductor industry, and by extension, the tech sector.
S&P 500	The Standard & Poor's 500 is a market value weighted index of 500 blue chip stocks. This index is considered to be an overall benchmark of the market as a whole.
Stochastics	An indicator used in technical analysis. Stochastics are often used to determine whether a stock is overbought or oversold.
Stock Split	When a company increases the number of shares outstanding by splitting existing shares.
Support	The price for a stock identifying the lowest likely trading price under present conditions, below which the price of the stock is not likely to fall.
Technical Analysis	Technical analysis deals with identifying trends of the market and stocks.
Ticker Symbol	These are letters assigned to a particular stock, option, or mutual fund used to identify that particular security for trading or quoting purposes. A ticker symbol with three (3) letters or less implies that the stock trades on the New York Stock Exchange, while a ticker symbol of four letters or more implies that stock trades on the NASDAQ.
Total Expense Ratio	An annual fee charged to mutual fund shareholders (usually as a percent of total investment) for the administration, operations, and management expenses associated with a particular mutual fund. The annual expense may include management fees, 12(b)1, and other fees.

Trading Range	The difference between the high and low prices traded during a period of time.
Trend Lines	A trend is the general direction in which stocks tend to move. A line is a path traced by a moving point. When you combine the two words together, you get an extremely powerful technical indicator that can be used to generate entry/exit points.
Volume	A stock's volume is the total number of shares transacted during the session (one day).
Yield	In stocks and bonds, yield is the amount of money returned to investors on their investments. Also known as, rate of return.

2.2   Stock Market Operations

As new businesses bloom, founders of these new creations make their bid on the most optimal success strategies. A solid foundation from the start is a decisive factor in the ultimate fate of the company. Early decisions, such as initial investment and private or public ownership define the ability as well as the size of the company.

A business can be held either privately or publicly. In a privately owned company, a single individual or a small group is in complete control of all aspects of the enterprise. A publicly owned company, on the other hand, divides its ownership into shares. These shares are sold on a day-to-day basis on the stock market where anyone can buy them and become a part owner of a company.

Early business decisions take an important roll in the unraveling and future growth. Once a company leaps into the public eye, the potential growth for that company is infinite. The stock market becomes a well-oiled machine that brings together investors that are searching for profit and companies that are desperately looking for funding.

3 INVESTMENT STRATEGIES AND TOOLS

With many strategies and tools available to investors for analysis of the stock market, knowing what is available is very important to becoming successful. In this section, we overview common tools, techniques, and strategies that have emerged over the years to help investment analysis.

3.1 Technical vs. Fundamental Approach

Understanding the situation and being able to react quickly to changing conditions is essential in investment. There are two basic approaches for forecasting market conditions and price movement that have emerged over the years; fundamental and technical.

The fundamental approach takes into consideration various economic factors that influence the supply and demand. Looking at these economic changes, a general direction of the price could be foreseen. The shortage of supply with an increased demand would in turn drive the overall price up: the increase of supply without an increase in demand would lower the price. An investor with a fundamental strategy is watching for general trends and changes in the whole economy or the individual sector to alert him or her about his or her investments.

The technical approach, on the other hand, assumes that it is simply impossible to consider all the factors affecting the supply-demand relationship. Instead, a technical analyst is concerned with the quantitative, statistical data available about the stock market and using this data to anticipate future changes. Three major underlying assumptions must be made to justify the logistics behind the use of this analysis:

1. "Since people act on financial information that is not yet published, the market discounts the future."

2. "Prices move in trends."

3. "History tends to repeat itself."[*]

The first assumption considers the fact that the ball starts rolling and the chains start moving in the stock market much earlier than the general public knowledge about some major changes that would affect the appeal of the companies to the investors. The second assumption gives a valuable tool for extrapolating these shifts of investments, and the third is based on the fact that investors are human beings, who do not just act rationally and logically, but base their decisions on emotions such as greed and fear. By understanding the underlying human nature of the stock market, one can predict it, and since people have similar instincts and feeling in similar situations, they are prone to follow the same patterns of behavior.

All three are very important observations because they give good reasons for following the statistical data. They allow the investor to catch a small, but significant glimpse into the future.

These techniques are not mutually exclusive, and none is perfect. A happy, personal medium must be found for each individual investor and each particular situation. Market is an ever-changing environment that is affected by uncontrollable variables, and at anytime any one technique could be more effective than the other.

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[*] (Kamich, 13-15)

3.2 Technical Analysis Tools

3.2.1 Reading and Interpreting Charts

A price chart is a sequence of prices plotted over a specific timeframe. In statistical terms, charts are referred to as time series plots. Charts provide us with up to date price performance of stocks. When properly translated, charts become a huge addition to our arsenal of analysis tools. Charts give us a direct visual of price fluctuations, which enables us to recognize patterns. These patterns can indicate a strong buy or a strong sell . It is important for the investor to be able to distinguish between a "buy" and a "sell" signals.

3.2.2 Types of Charts

3.2.2.1 Line Charts

One of the simplest graphs to construct and maintain is a line chart. It provides a way to show a direct relationship between two variables. Since time is money, one of the most common comparison variables is, of course, time. Finding a trend between, for example, time and stock prices would allow the investor to correctly time his or her transactions to achieve maximum profit. An example of a line chart can be seen in Figure 1.

Figure 1. Example of line chart (obtained from www.bigcharts.com)

Pros:
- Very good at tracking a single statistic
- Bring out trends, which are otherwise hard to obtain just from the numbers
- Great for seeing the overall patterns or trends

Cons:
- Can only considers two variables at a time
- Only uses one point per time slice, usually an average
- Do not include potentially important information

3.2.2.2   Bar Charts

Bar charts portray four important pieces of information: the high, the low, the opening or the start and the close or settlement for the given period. The vertical axis usually represents the price, and the horizontal as the time. These points are critical. With a quick glance at a bar chart, the mood of the investors during that period is much more apparent. By looking at the closing prices, the idea of who is dominating the market can be established. If the closing price for the day is higher than the previous day, the buyers are more dominant because they are driving the price up. On the other hand, if the closing price is below, the sellers are the dominant traders, therefore moving the price

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down. The range between the two closing prices can also indicate the strength of the push by either type of traders. An example of a bar chart can be seen in Figure 2.

In addition, since the other information is also readily available on the graph, other important variables can also be extracted. Looking at the lows and the highs, during that period could indicate the urgency or the commitment of the sellers and the buyers. If the range between the two are expanding rapidly than the urgency could be going up, since people rushing in to buy or sell therefore moving the price and expanding the range. The contrary is also true if the ranges are contracting as well.

Figure 2. An example of bar chart (obtained from www.bigcharts.com)

Pros:
- Very versatile
- A lot of information in one chart
- Information is readily available, no need for calculations
- Easy to read

Cons:
- Messy when used for very detailed, long-term periods of time

3.2.2.3   Candlestick Charts

Candlestick chart is one of the oldest charting methods. With the use of shapes, colors and positions, the candlestick chart conveys a large amount of information in a

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very compact and lucid form. Like the bar chart, the vertical axis is used to represent the price, while the horizontal axis is used to represent the time. Variables such as the low price, the high price, the opening price, the closing price, as well change compared to previous price can easily be extracted from this graph. The patterns in candlestick setup, like reversals, are easily identifiable therefore making it one of the more popular charts.

An example of the candlestick chart can be seen in Figure 3. Each "point" is built by drawing the box between the closing and the opening prices and then shaded dependent on the closing price compared to the previous closing price. The box is left open if the current price has surpassed the previous price, but if the price has fallen below the previous, the box is shaded. The lines on the top and the bottom are then extended to show the price range.
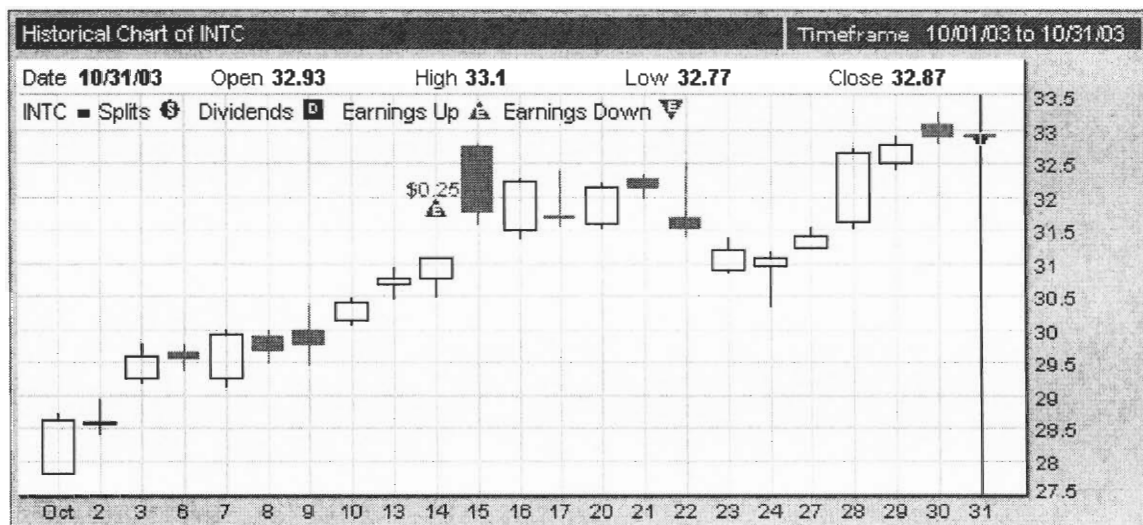
Figure 3. An example of candlestick chart (obtained from www.bigcharts.com)

Pros:
- Quick to identify turning points
- Patterns are easily identifiable
- Packed with useful information
- Presents the information clearly and logically

Cons:
- Do not provide price projections

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3.3   Important Indicators

Indicators are an important part of technical analysis. They are the mathematical and statistical tools that investors use as their reasoning and foothold to support their investment decisions. Full understanding, as well as the ability to interpret these indicators is essential to grasping an accurate picture of the market environment.   Not all of them can be applied for every situation, and not all have obvious signals or warnings. A reasonable combination of indicators must be taken into account before a conclusion about a stock can be made at any given moment.

While advantages of indicators can easily be seen, tracking all of them is almost impossible and can actually be less beneficial than it would seem. Most of the indicators are derived from retrospective data, and as technical analysts, we are making the assumptions that these data would bring us lucrative information about the future. But it is also important to realize that some indicators are much more reliable than others in certain circumstances. There could be situations where two indicators are suggesting contradicting outlooks. As smart investors, stepping back and looking at secondary sources could reveal which of the two is really applicable in a particular situation.

As a group, based on our research, we have chosen some primary indicators that we feel would provide us with an adequate picture that would allow us to make intelligent decisions about our investments. Using these indicators, we created criteria and used those criteria to filter and select stocks for our company portfolios. These indicators are Volume, Directional Movement Indicator, Bollinger Bands, Parabolic SAR, RSI and Momentum. Each one of these is explained in greater detail below:

3.3.1 *Volume*

A stock's volume is the total number of shares transacted during the session. This figure can be used to confirm certain conjectures that are made about the projected price changes. A diminishing volume during an uptrend could forecast reversal and warn of the weak trend. An increasing volume during an uptrend with almost no price movement could signify that even with the buying pressure, the selling pressure is just as potent, therefore holding the price back. Volume could also possibly be used as one of the indicators to identify the bottom of a downtrend. After initial high volume selling pressure, the volume slowly drops off since more and more investors who want to sell the stock after certain news or events have already done so. The selling pressure is lowered, and therefore if the buying pressure is still pretty high, a positive rally could be possible.

3.3.2 *Directional Movement Indicator (DMI)*

Directional Movement Indicator helps provide an indication of the strength of a trend in a specific stock. It incorporates three components: the Average Directional Movement (ADX) index, Positive Directional Indicator (DMI+) and the Negative Directional Indicator (DMI-). The first, ADX rates the strength of the trend on a scale of 0 to 100. The higher the ADX, the more chance the stock will continue to follow its already set pattern. The DMI+ shows the upward movement of the stock, while the DMI- gives the negative movement. One of the buy signals is the point where the DMI+ crosses DMI-, while the opposite is a sell signal as the DMI- crosses the DMI+. The strength of these intersection points and their meaning are only meaningful if the strength of the

developing pattern or the ADX is high. An ADX value greater than 30 is commonly considered an indication of a strong trend.

3.3.3   Earnings per share (EPS)

The net income of a company for the past 12 months divided by the current number of shares. Many investors consider this an important fundamental to consider when deciding whether to buy or sell a stock.

3.3.4   Price/Earnings Ratio (P/E)

This is an indicator of a stock's value. To figure out the price-earnings ratio, divide the stock's price by its earnings per share for a 12-month period. 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 overlooked 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. We tend not to depend on the P/E for our analysis because it indicates where a stock is rather than where it is going.

3.3.5   PEG ratio

This is an indicator of whether a stock is undervalued or overvalued. To obtain the PEG ratio, a stock's P/E is divided by its forecasted earnings growth rate. A fairly valued stock would have a PEG ratio of 1; its current P/E and future earnings growth rate

being equal. A ratio of less than 1.0 can be an indication that the stock is undervalued, and poised to grow. The usefulness of this calculation depends on the accuracy of the stock's earnings estimates. We feel this indicator is much more powerful than the P/E because it takes into account both the P/E itself as well as a forecasted growth rate.

3.3.6 Beta coefficient

This is a measure of a stock's volatility (measurement of the propensity of a stock to rise or fall sharply in price) relative to the overall stock market. The beta coefficient of the S&P 500 is 1. Any stock that is more volatile than the market as a whole has a beta value higher than 1. If the beta coefficient is less than 1, the security is considered to be less risky than the market. As short-term investors, we tend to look for stocks that have higher beta coefficients.

3.3.7 Bollinger Bands

Bollinger Bands, created by John Bollinger, are a type of envelope (or trading band) plotted at standard deviation levels above and below a moving average. Because standard deviation measures volatility, the bands widen during volatile markets and contract during calmer periods.

As stated in Steven Achelis's, *Technical Analysis from A to Z* (Chicago: Irwin, 1995), Bollinger has the following to say about this indicator:

- Sharp price changes tend to occur after the bands tighten, after volatility lessens.

- When prices move outside the bands, a continuation of the current trend is implied.

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- Bottoms and tops made outside the bands followed by bottoms and tops made inside the bands call for reversals in the trend.

- A move that originates at one band tends to go all the way to the other band. This observation is useful when projecting price targets.

We have used this indicator occasionally to help make a decision about whether to buy or sell a stock at a particular time.

3.3.8 *Parabolic SAR*

The Parabolic Time/Price System developed by Welles Wilder, is used to set price stops and it is usually referred to as the stop-and-reversal (SAR) indicator.

Some technical analysts believe that the Parabolic SAR provides excellent exit points. We rely on this indicator to make many of our buy/sell decisions. We look for stocks whose price is higher than the SAR.

3.3.9 *RSI*

Relative Strength Index (RSI) is a momentum indicator which measures a security's price relative to itself and its past performance; therefore indicating its internal strength. It depends solely on the changes in closing prices. RSI is less affected by sharp rises or drops in a security's price performance and, therefore, may give a better reading than other indicators. RSI is calculated by taking the average of the closes of the up bars (the up frequency intervals) and dividing them by the average of the closes of the down bars. The RSI ranges between 0 and 100. RSI is said to indicate an "overbought" condition when it is above 80 and an "oversold" condition when it is below 20.

We use RSI very often in our analysis of our stocks on a day-to-day basis. When we think a stock's RSI has "bottomed out" we will seriously considering buying it, as this trend has often led to a sharp rise in the stock's price in the next few days.

3.3.10 Momentum

The Momentum indicator measures the amount that a stock's price has changed over a given time span. The Momentum indicator displays the rate of change as a ratio.

A good time to buy would be when the indicator bottoms and turns up and sell when the indicator peaks and turns down. If the Momentum indicator reaches extremely high values and then turns down, we assume prices will probably go still higher for some time.

3.4 Recognizing Patterns and Trends

3.4.1 The "Cup With Handle" Pattern

Just as we first look for the big dipper when we look at the stars in the sky, we should first look for the cup and handle pattern when viewing price charts. The cup with handle pattern is the clearest and most commonly spotted pattern in the investment world. This pattern can surface within the time window of seven to 65 weeks. The cup is usually rounded at the bottom. If it is more "V" shaped, there is a good chance that it is not a "cup with handle". Furthermore, the handle will have a slight downward trend. This phenomenon is the result of selling pressure. Investors who had lost money at the first decline are on the edge of their seat waiting to sell when they can break even at the second peak. As a result, the stock price will move sideways and slightly downward for

at least four days, and at most four weeks. After this period of slow decline, the price

will dramatically increase. Figure 4 is an example of a cup with handle pattern.
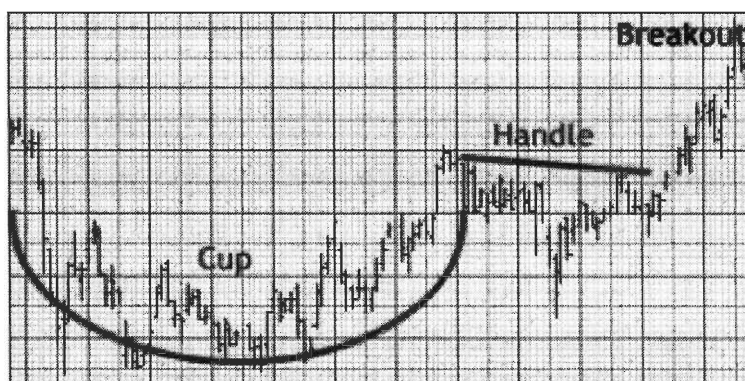
Figure 4. "Cup and Handle" Pattern.[†]

3.4.2 The "Saucer with Handle" Pattern

Similar to the cup with handle pattern, the saucer with handle reveals a strong buy

point shortly after the handle. The saucer exhibits the same characteristics as a cup

except it is over a longer period of time. The reason that these two are distinguished from

each other is because the saucer usually indicates that a stock's price has reached its long

time low and that the downward trend has ended. This also makes for a more shallow

dip, which might be harder to recognize.

3.4.3 The "Double-Bottom" Pattern

This reversal pattern resembles the shape of a "W". A reversal pattern is one in

which the trend before the pattern is reversed after the pattern. The second dip in the

"W" is slightly lower than the first. by approximately 4%. Volume should advance

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[†] *All Images in this section have been obtained from Investopedia.com*

during the last rise in stock after the second dip. The buy point is usually when the stock is coming up to the middle peak of the "W". If the double bottom has a handle then the buy point should be when the price is highest in the handle. The double bottom is not as common as the cup with handle but it is a very distinct price change pattern thus important to study. Figure 5 illustrates a good example of this pattern.
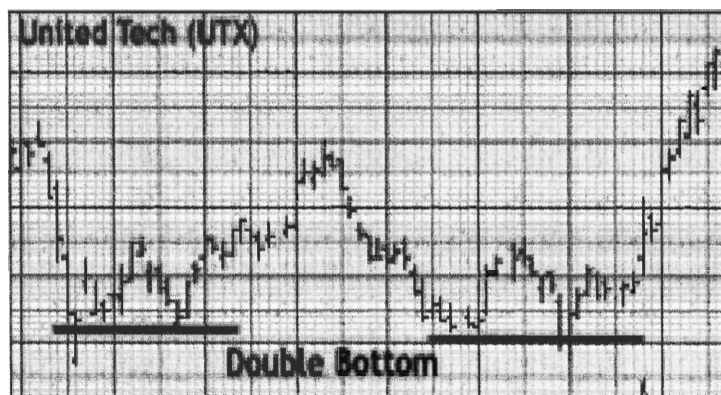
Figure 5. Double Bottom Pattern

3.4.4 The "Flag"

The flag or "pennant" is speculated to be one of the most reliable continuation patterns. A continuation pattern is one in which the trend before the pattern is continued after the pattern. It represents a brief pause in the market usually occurring right after a big move. Flags tend to consist of only small fluctuations in price where the general direction of the flag is opposite from the general direction of the breakout following it. During the pause, the volume is usually getting smaller until the breakout, where the volume will increase. The following illustrates a good example of this pattern.
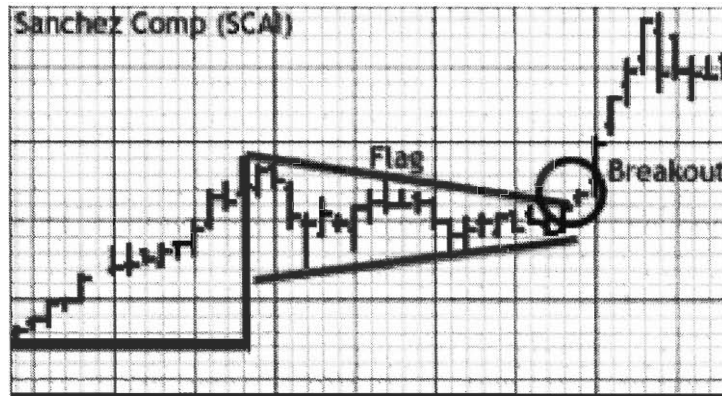
Figure 6. The "Flag" Pattern

3.4.5 The "Head and Shoulders" Pattern

The head and shoulders pattern is believed to be one of the most reliable reversal patterns. It consists of three humps. The first hump is the left shoulder. The second hump is the head and the peak of this hump is higher than that of the left shoulder (for a bull market before the pattern). The third hump is the right shoulder and the peak of this is at about the same level as the left shoulder. It is important to recognize volume changes in addition to this pattern for proper interpretation. The volume should take the same shape as the price, although it should be slightly shifted to the right. Figure 7 shows a typical head and shoulders formation.
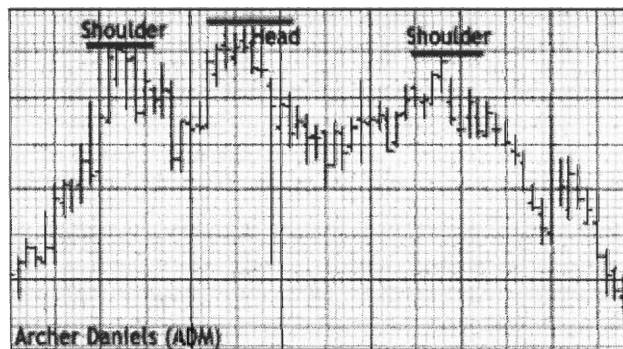
Figure 7. The Head and Shoulders Pattern

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3.5   Trading Psychology

Many common mistakes investors make have to do with the psychology of trading. The way humans make decisions can have a negative impact on their portfolios. In *How to Make Money in Stocks*, William J. O'Neil suggests that investors stick to stringent guidelines when it comes to investing. When investors make decisions based on human emotions, losses begin to accumulate while profits are minimized.

The foremost mistake investors make has to do with the timing of when to sell a falling stock. Investors tend to stubbornly hold on to losses while they are small and reasonable. Hoping that the stock will return to its original price, humans' emotions take over causing them to hold onto the loss until it becomes very costly. Some think that they have incurred no loss until they actually sell the stock. Conversely, the truth is that the loss is occurring as the stock drops in price. It is best to sell a falling stock early (O'Neil suggests limiting losses to 7% or 8%). Once the stock is converted back to cash, the investor is more likely to make a wise, objective investment decision.

Another common misconception that plagues imprudent investors is the notion that rising stock is bound to fall. This error can hurt investors in two ways. First, investors may afraid to put money into a stock that has reached a new high. Secondly, an investor might sell his shares for a small profit while the stock still has much potential. The truth is that stock is probably doing well for a reason. Automatically assuming that a rising stock will soon fall can significantly affect profit maximization.

For similar reasons, investors should generally avoid stocks that are falling. Psychologically, it is natural to assume that a stock that has recently declined is now at a bargain price. However, this is the kind of mentality that gets investors in trouble. The

stock has most likely fallen for a reason. Just because a stock has reached a low point, does not mean it cannot get any lower.

O'Neil claims that 95% of investors are affected by the "price-paid bias." This bias is displayed when an investor is influenced by the price he originally paid for a stock when he considers selling it. The investor will tend to sell stocks in which he has made profit and hold on to stocks that have lost value. "However, what you should be doing is selling your worst performing stocks first. Keep your flower patch free of weeds" (O'Neil, 94). There are many indicators and trends that can help an investor decide on whether to sell or not. Relying on this type of research and analysis is much wiser than looking at the original buying price.

4 THE INVESTMENT PLAN

4.1 Simulation Process

In the beginning of our simulation, we chose to invest $300,000. These starting assets were divided equally between each member of our group to spend, as we felt necessary, to achieve our ultimate goal of maximizing profit. Each member was in charge and ultimately responsible for his share of the main portfolio. Throughout the simulation, we were able to develop our own criteria that would define our individual investment strategies. Using these criteria to filter and narrow down the selection, we chose the companies that we believed to be lucrative.

4.2 Project Limitations and Other Observations

Since this simulation does not involve real transactions, our actions are not reflected on the actual stock of the company. We are investing a substantial amount of money, which could possibly affect the decisions of other potential sellers or buyers. Because of this, we will try to put our investments mostly into high volume corporations to try to make our actions negligible and minimize this phenomenon.

4.3 Investing the Smart Way

The smartest way to invest is to set strict guidelines and stick to them. Although many believe that randomly selecting companies can be just as effective, doing some research and using technical and fundamental analysis is a much wiser choice. Through our research and experience, we have come up with our own investment guidelines that are specifically designed for our investment situation; nine weeks of investment,

attempting to make as much profit as possible. This situation calls for a rather risky investment plan. It would be much different if, for example, a middle-aged person were to start to invest for his retirement. These two very different situations exemplify the idea that specific investment situations call for specific investment plans. It is important to realize your predetermined goals so that you can invest accordingly.

The process of investment broke down into four essential elements:

- Searching for a suitable company
- Buying a certain number of shares
- Following the company's progress
- Selling a portion or all the shares

4.3.1 Company Search

The first step was finding companies that fit our profile. Since, a vast amount of information is available online, we were able to take advantage of that and use the internet as our main source of market research. This was accomplished using several tools provided to us by different websites listed below:

www.bigcharts.com
- Convenient Java-based tools allowing for easy and quick analysis of stocks, as well as a research database with news and events

www.quicken.com
- An Online Portfolio Management system

http://cbs.marketwatch.com/
- Another great source for stock market analysis tools

http://iw.thomsonfn.com/iwatch
- A unique website that provides a rare "view into the world of institutional trading" and potential institutional activity

Each one of these sources provided us with accurate information that allowed us to make smart decisions, which made our investments more than just intuitive gambles, but justified investments. This step is one of the most important to any successful investor. An expert is able to maneuver through an excess of useless information and zone into the lucrative, worthwhile signs that will guide him to profitable companies. With substantial ventures and high stakes, the importance of the preparation and research grows exponentially.

4.3.2 Buying Shares

After gaining valuable insight about the companies and using our personal trade guidelines, we were left with a list of potential companies that fit our profile. At this point we focused on looking closely for the right time to enter the market, and based on the strength of the buying signal, also, how much we were willing to risk losing in case the wind changed direction and the market turned against our forecast.

Below are some loose guidelines, which we used to rate our companies for potential investment:

1. PEG ratio < 1

    It was important for the PEG ratio to be low since an undervalued company had potential for serious growth.

2. EPS Growth

    We considered one-year EPS growth. We looked for stocks that have EPS Growth rates above the industry average.

3. Revenue Growth

    We found this indicator to be useful in measuring how fast a company's business was expanding. We also chose to consider

this over one year while looking for stocks with Revenue Growth rates above the industry average.

4.   Income Growth

Looking at company's Income Growth over the past year, we considered companies who were above the industry average.

5.   Consensus Rating

This rating is given to stocks based on professional analysis by top analysts. We trust professional judge to a certain extent and require a consensus rating of at least two, or Buy, in our stock selection.

6.   Current Ratio > 1

We believe a company's current ratio was important in determining whether a company was bound end up a failure. It was especially important in testing low-profile companies that may have peaked our interest. We only considered stocks with a current ration higher than one.

7.   % held by insiders

It is only common sense that a company whose employees were financially invested in it would have a better chance succeeding. Therefore, we chose to consider companies in which at least 20% of the shares were held by insiders.

Once we chose a company, the next step was to consider the whole market and to decide the appropriate time to invest. There were three major factors to consider when we were dealing with the timing. First, the Relative Strength Index, which determined whether a stock was "overbought" or "oversold", needed to be lower than 40. We have observed that this indicator gave an indication of when a stock would rise or fall. This was important, not only because of the initial monetary gains, but also because an initial gain in a long-term investment would make the investor feel better about his decision.

Next, we looked at the Parabolic SAR. When this indicator fell below the price of the stock, it would generally have an upward trend, indicating a strong buy signal. Finally, spotting the "Cup and Handle" trend (Discussed in Chapter 3.4) was an important determinant in the investment decision. We saw these three signs as the most indicative patterns for a successful investment.

4.3.3 Following the Investment

Once the fate of our money was completely in the companies that we invested in, all we could really do was watch and observe. This turned out to be one of the most strenuous portions of the investment process. Due to the relatively short trading period, the spurious waves of peaks and valleys were important to catch to collect profit. Anxiety over uncertainty of the outcome, as well as doubts of the market analysis and other unexpected variables that potentially could have changed the market direction contributed to a very arduous period of waiting and constant real-time analysis.

4.3.4 Selling

Constant reevaluation of the stock market as a whole, as well as close examination of the day-to-day or hour-to-hour changes to the individual companies allowed us to identify possible hold or sell signals. This gave us the idea of when we should have collected our profit or cut our losses.

Ideally, we would have liked to sell the shares when the stock had reached its highest point and it was about to drop. Since it was nearly impossible to be that precise, we chose three more indicators, which we believed to most closely associate with a

stock's inclination to for a reverse from the trend. First, as a low RSI value was a buy signal, conversely, a high RSI value was a sell signal. When the RSI had exceeded 75, it was a good idea to sell, unless other indicators suggested otherwise. Second, the Momentum indicator had proved to be very helpful in determining when to sell our stocks. Low momentum was a sell signal and low decreasing momentum was a very strong sell signal. Lastly, the "Head and Shoulders" pattern, although difficult to recognize accurately, was usually a sure sign to sell. We were confident that adhering to these guidelines would result in a lucrative investment experience, if we would take the time to research thoroughly and accurately to observe these signs.

5 INVESTMENT ANALYSIS

In this section, we explain and analyze the different decisions and directions that we pursued in the course of this short-term simulation. Having a chance to look back and reflect on our actions provides us with a non-bias and retrospective view of the events that triggered our investing decisions. It allows us to analyze all the variables that might not have been obvious or have been overlooked at the time, and based on that, evaluate our choices.

5.1 Transactions

The complete transaction list throughout our simulation can be seen in

Table 1. Simulated Transactions

Buy Date	Sell Date	Company	Shares	Bought	Sold	Initial Value	Final Value	Profit
10/02/03	10/03/03	TXN	200	$23.50	$24.65	$4,700.00	$4,930.00	**$190.00**
10/07/03	10/09/03	AMZN	200	$55.50	$58.12	$11,100.00	$11,624.00	**$484.00**
10/14/03	10/30/03	INTC	500	$31.76	$33.21	$15,880.00	$16,605.00	**$685.00**
10/30/03	11/12/03	BBBY	400	$42.84	$43.10	$17,136.00	$17,240.00	**$64.00**
11/05/03	11/12/03	VLCCF	5000	$8.94	$10.80	$44,700.00	$54,000.00	**$9,260.00**
11/13/03	11/26/03	EASI	2000	$47.00	$53.70	$47,000.00	$53,700.00	**$6,660.00**
11/13/03	11/25/03	GIVN	1000	$17.50	$17.21	$17,500.00	$17,210.00	**-$330.00**
10/4/03	11/14/03	ORCL	300	$11.98	$12.57	$3,594.00	$3,771.00	**$137.00**
10/15/03	11/14/03	ORCL	450	$12.23	$12.57	$5,503.50	$5,656.50	**$113.00**
10/6/03	10/8/03	LOGI	300	$31.67	$33.26	$9,501.00	$9,978.00	**$437.00**
10/7/03	10/30/03	MSFT	300	$29.21	$26.26	$8,763.00	$7,878.00	**-$925.00**
10/9/03	11/12/03	MSFT	300	$28.82	$26.03	$8,646.00	$7,809.00	**-$877.00**
10/9/03	10/15/03	HRB	300	$44.00	$45.75	$13,200.00	$13,725.00	**$485.00**
10/9/03	10/14/03	BBY	300	$52.60	$54.25	$15,780.00	$16,275.00	**$455.00**
11/18/03	11/28/03	BBY	1000	$57.40	$62.00	$57,400.00	$62,000.00	**$4,560.00**
10/10/03	11/20/03	HPQ	500	$21.05	$22.20	$10,525.00	$11,100.00	**$535.00**
10/14/03	11/3/03	CUB	750	$28.03	$29.64	$21,022.50	$22,230.00	**$1,167.50**
10/19/03	11/14/03	CF	500	$31.35	$32.57	$15,675.00	$16,285.00	**$570.00**
10/19/03	10/29/03	MRGE	1000	$19.20	$17.92	$19,200.00	$17,920.00	**-$1,320.00**
10/29/03	11/13/03	INTL	500	$25.36	$25.36	$12,680.00	$12,680.00	**-$40.00**
10/30/03	11/13/03	SHRP	450	$28.50	$32.00	$12,825.00	$14,400.00	**$1,535.00**
10/09/03	10/13/03	ADBE	300	$41.99	$43.08	$12,597.00	$12,924.00	**$287.00**
10/10/03	10/13/03	PLCE	300	$25.25	$26.80	$7,575.00	$8,040.00	**$425.00**
10/10/03	10/13/03	IACI	400	$38.89	$38.72	$15,556.00	$15,488.00	**-$108.00**
10/13/03	10/15/03	PLCE	1000	$26.89	$28.33	$26,890.00	$28,330.00	**$1,400.00**

10/13/03	10/30/03	ADBE	500	$42.70	$44.94	$21,350.00	$22,470.00	$1,080.00
10/30/03	12/06/03	BAC	500	$75.12	$75.11	$37,560.00	$37,555.00	-$25.00
10/30/03	12/06/03	NXTL	1000	$24.10	$25.37	$24,100.00	$25,370.00	$1,250.00
10/30/03	12/06/03	QCOM	500	$48.03	$49.48	$24,015.00	$24,740.00	$705.00
TOTAL								$328,859.50

5.2   Overall Analysis

After nine weeks of simulation, we increased our total assets by 9.6%.   The fact that we made money was a notable accomplishment.   Using the technical analysis techniques, we succeeded in making the correct decisions, which in the end paid off with a good profit margin.   If we were to continue this simulation with the same rate of success, we would be able to double our initial investment of $300,000 in about fifty-six weeks, or a little over a year.

To see how our portfolio matched up with the market, we graphed our day-to-day transactions along with the NASDAQ index, as illustrated in Figure 8.   This allowed us to see possible correlations and trends.
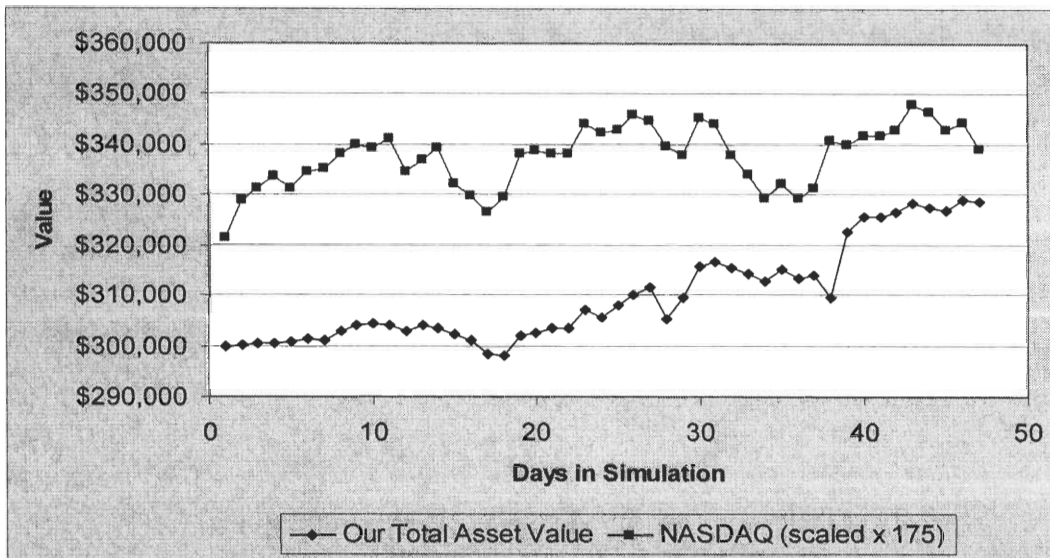
Figure 8. NASDAQ vs. Our Portfolio

The total value of the portfolio seemed to follow general characteristics of the

NASDAQ graph, which suggest a correlation between the two. The influence of the

direction of the whole market has a great effect on individual companies in that market.

Since most of our investments included companies on the NASDAQ, an association

between them was expected.

To see the bigger picture, we also obtained a graph of the Wilshire 5000, which

was started in 1974 and is often referred to as the Total Stock Market Index. It seeks to

track the returns of practically all publicly traded, U.S.-headquartered stocks that trade on

the major exchanges. Similar to other indexes, the Wilshire 5000 is market-cap weighted

giving larger companies more influence over the index movements. Figure 9 shows the

overall market for the period of our investments - from October through November.

There is an apparent uptrend in the total market that is also consistent with our profit for

that time period, as well as with the NASDAQ.
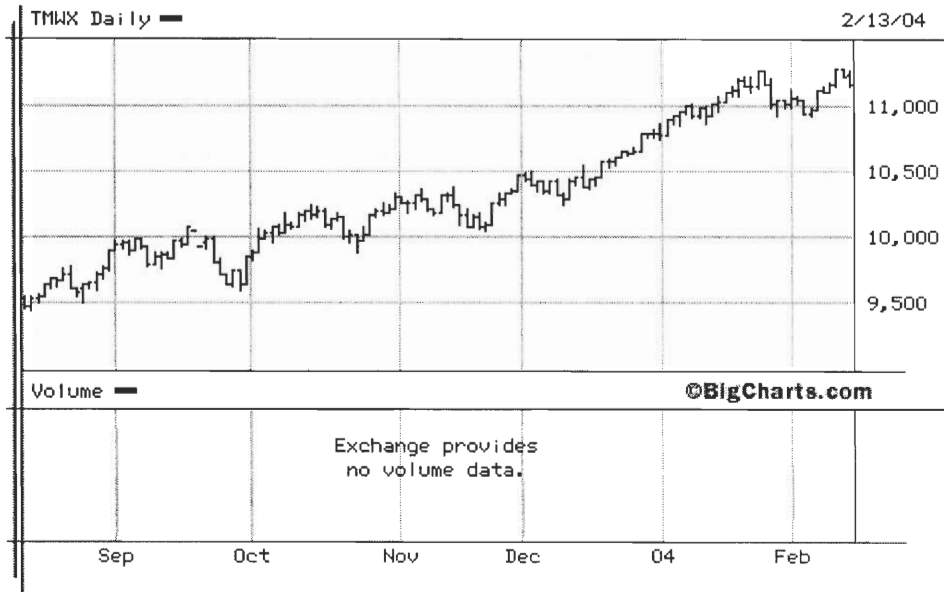
Figure 9. Wilshire 5000 Total Market Index

For comparison, Figure 10 shows the overall market index along with the

NASDAQ. There also seemed to be a direct relationship, which in turn also implies that

the characteristics of our portfolio were also very much influenced by the total market.
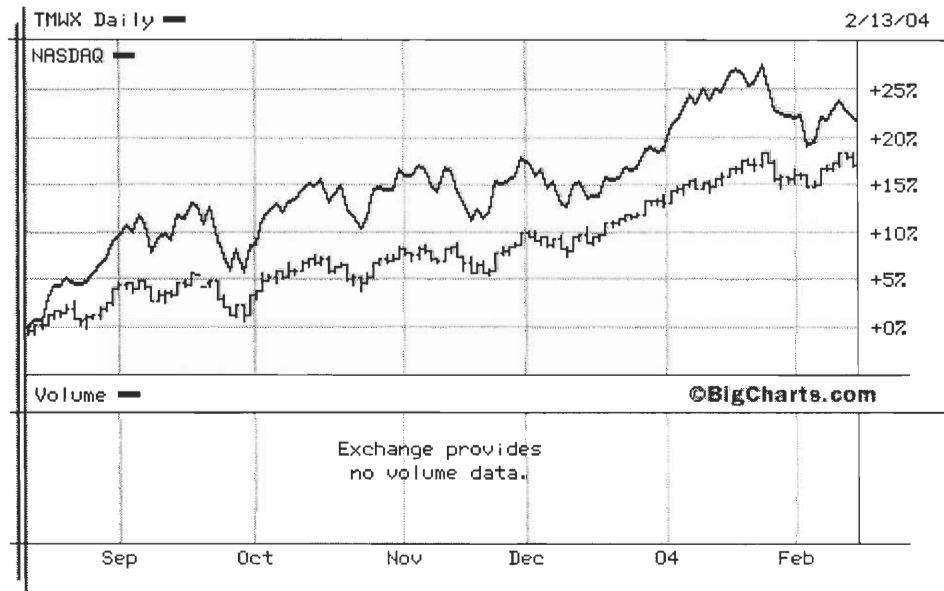
Figure 10.   Wilshire 5000 Total Market Index vs. NASDAQ

These graphs suggest that the rebounding economy, as well the rekindled

confidence of investors, seemed to have influenced our investment portfolio. Our

investments did not drastically oppose the trend of the market, but rather drifted with the general trend, which, luckily for us, was increasing.

5.2.1 Amazon.com Inc

AMZN	Date	Quantity	Price/Share
Bought	10/07/03	200	$55.50
Sold	10/09/03	200	$58.12
Total Profit	**$484**[‡]		

Table 2. Amazon.com Transaction Info

As one of the first companies, this was one of the stepping-stones to really understanding and using our technical analysis background to help us make intelligent investments.

Amazon was chosen based not on specific criteria, but on the hype and build up, the company received during the course of the year.   It has been on a steadily incline since the stock market crisis in the beginning of the 21st century.

[‡] The commission fee adjustment of $20/transaction deducted. This will be assumed for the rest of the transactions as well.

Historical Chart of AMZN				Timeframe 12/12/00 to 12/12/03
Date 3/24/00	Open 74.625	High 75.25	Low 71.313	Close 72.688
AMZN ■ Splits ❶ Dividends ▣ Earnings Up ▲ Earnings Down ▽ Parabolic SAR ■				
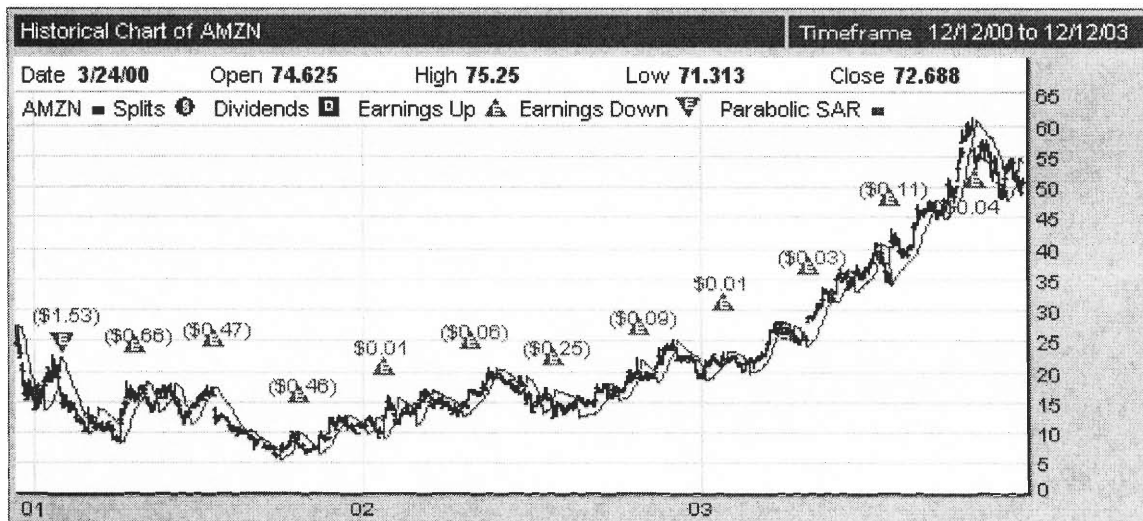
Figure 11. Amazon.com 2001-2003[§]

With increasing earnings and expanding economic horizons, Amazon has gained the trust of new investors. It is in the midst of launching new stores and exploring new ventures. Some analysts even predict a full-year net profit for this rapidly growing company.

Looking at the bigger picture, with the holiday season coming up, major tax breaks from the government, and money-conscience consumers, online retailers like Amazon.com draw major traffic to their virtual shopping malls. Many investors would anticipate this increase of commercial activity and invest in the companies, there by also driving the demand for the stock up and increasing the price of the shares. This fundamental trend developed even before we started our simulation.

The indicators also played a major part in the initial decision to invest in Amazon.com. The most influential being the Parabolic Stop-And-Reversal (SAR) indicator and Directional Movement Indicator (DMI), which helped provide an indication of the strength and the direction of the trend. The DMI can be seen in Figure 12. Both

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[§] All stock charts in the following sections have been obtained from www.bigcharts.com

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the DMI+ and the DMI- are diverging, while the ADX is around 30 and is increasing. This indicator suggests a relatively strong positive trend.
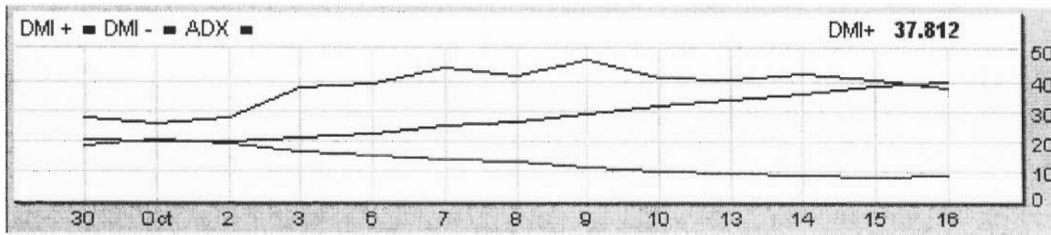
Figure 12. Amazon.com Directional Movement Indicator

The Parabolic SAR, which can be seen in Figure 13, also suggests a strong positive movement. The SAR being safely below the price indicates a continuation of the current pattern.
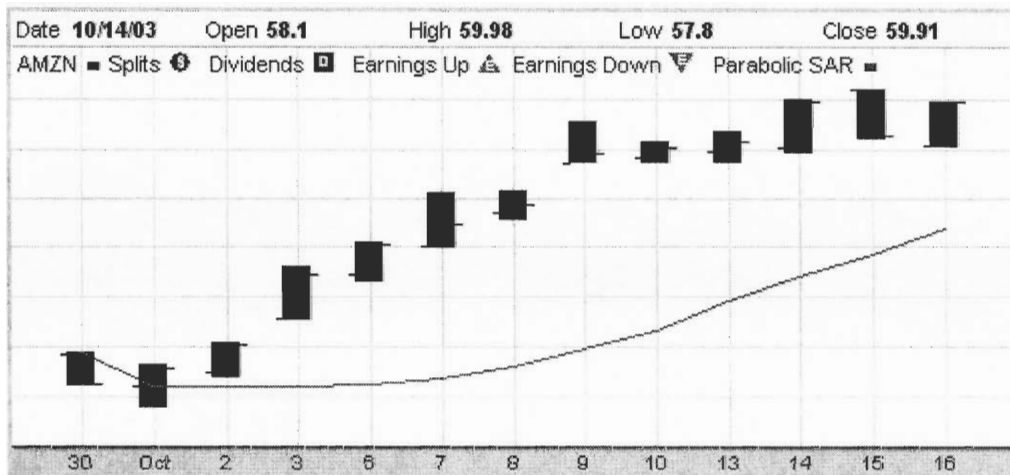
Figure 13. Amazon.com Parabolic SAR

Realizing that Amazon.com has been on an uptrend for almost a year, precautions must be taken to be able to recognize and act in case of a reversal. With the volatile market and very nervous investors, a company can only sustain such a high level of growth for only a period of time before it falls back into its down cycle. For this reason, other indicators to warn of reversal signs were examined, such as the Relative Strength Index (RSI) and Momentum.

BBY	Date	Quantity	Price/Share
Bought	10/9/2003	300	$52.60
Sold	10/14/2003	300	$54.25
Bought	11/18/2003	1000	$57.40
Sold	11/28/2003	1000	$62.00
Total Profit	**$5,015.00**		

Table 3. Best Buy Inc. Transaction Info

Our investment in Best Buy Company Inc. is rather interesting to reflect on. Our original interest in this company had to do with its general popularity as a retail store. Then, after careful consideration of some technical indicators, which we thought were most relevant (primarily Relative Strength Index and DMI in this case), we bought 300 shares at $52.60 on October 9th.

This proved to be a solid investment in a company that showed steady growth and excellent potential. However, as we were still in the beginning stages of our simulation, we were inexperienced as investors. We were more apprehensive about losing our earnings than we were eager to build on them. When the stock reached $54.45 on October 14th, we sold all the shares and made a net profit of $455.00. Although any investment ending in a profit usually is not considered a mistake, in the middle of November, when we looked back on our decision to sell, we realized that we made a poor trading decision. The Best Buy stock had continued to steadily increase and was approaching $58.00. We missed out on extending our profits by more than $1000.

Seeing that this company had even more potential than we had originally thought, we decided to reinvest on a much bigger scale. On November 18th, we bought 1000

shares at $57.20. This proved to be one of the best investment decisions when we sold

our shares on November 28th for $62.00. Not only did we make a profit of over $4500,

but our timing was almost perfect this time. We sold just before the price began to

decline. We paid close attention to the RSI indicator. Last time, we sold the Best Buy

stock when the RSI reached 67. This time, we waited for the RSI to increase to a value

over 70 before selling.

Our trading experience with Best Buy was rewarding on multiple levels. Not

only did we make monetary gains from buying this stock, but we also learned a great deal

about investment decisions, namely, when to sell. Technically, by looking at our two

investments in this company, we can conclude that using an RSI value of greater than 70

is a good indicator of when to sell. Further, we got first-hand experience a major aspect

of trading psychology (discussed in Chapter 3). We assumed that this rising stock was

bound to fall. However, we realized that it is wise to allow rising stocks to continue to

grow in order to maximize profit.

5.2.3   Adobe Systems

ADBE	Date	Quantity	Price/Share
Bought	10/9/2003	300	$41.99
Sold	10/13/2003	300	$43.08
Bought	10/13/2003	500	$42.70
Sold	10/30/2003	500	$44.94
Total Profit	**$367.00**		

Table 4. Adobe Systems Transaction Info

As we were doing our research, we noticed Adobe was the second most active

stock of the day, indicating a possible investment opportunity. Active stocks means more

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potential price change in the positive direction in a short period of time. More people is

equal to more money and more money means more profit. Considering the familiarity

with this company's popularity and some brief researching, we were determined to invest

in this company. Since this was one of the first transactions, we were hesitant to invest

and took a less aggressive approach to trading. With 300 shares at $41.99 per share, we

had about ten percent of $100,000 involved in this transaction. This experimental run

turned out for the better. After only two days, we had acquired $271 dollars in profit.

This was a very exciting event! Here we see a direct correlation between trading volume

and large price moves. At the highest towers of volume, we see the biggest changes in

price. There are three significant examples in Figure 14.

Figure 14. Adobe Volume relationship to Price Volatility

After resurrecting Adobe's history records, we noticed that it had increased

significantly for the past three years in the last five months of each year. This gave us a

possible pattern of growth during our trading period. Furthermore, Adobe had released a new version of its product around the same period.

One particular lesson emerged from this transaction. It was fairly important to stay on top of the price changes. There were many times at which we could have sold our shares and profited more than we actually did.   Sometimes there were clear price spikes that indicate a good time to sell during the day. Since these spikes were almost impossible to predict, it was fairly important to stay with the game as frequent as possible during the day. For us, it meant checking and re-checking the stock tickers.

5.2.4   Intel Corp.

AMZN	Date	Quantity	Price/Share
Bought	10/14/03	500	$31.76
Sold	10/30/03	500	$33.21
Total Profit	**$685**		

Table 5. Intel Corp. Transaction Info

Buying an established company of such accolades as Intel was a conservative, low-risk transaction. Since it is a widely known company with millions of investors, and a price that fluctuates directly with the whole market, no considerable profit was really expected without market pressure. Unlike a small, successful start up, whose shares skyrocket from a few dollars to thirty dollars in a matter of a week, such behavior was not expected from Intel.

The indicators and the market movement did suggest a positive trend, and with the economy on the rebound and investors waking up after a slow, cautious investment period, a company like Intel offered a great opportunity to make some money.

Figure 15. Intel's Uptrend September – November

As it can be seen in Figure 16, all around, almost all technical indicators concurred with the positive trend. The Parabolic SAR was safely below the price; the momentum was in a strong positive cycle; both the DMI+ and the DMI- were diverging, while the ADX was around 30 and was increasing.
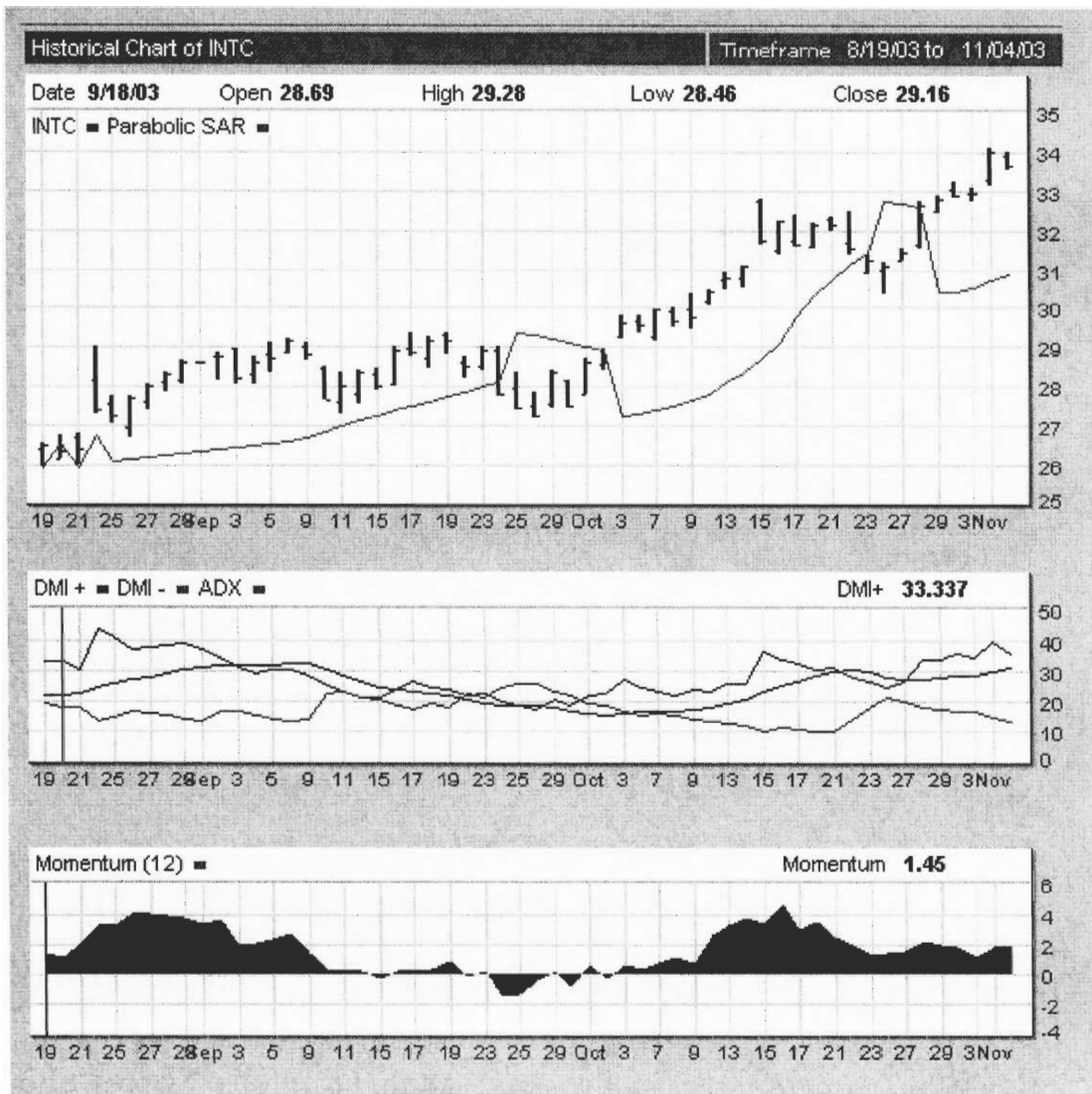
Figure 16. Intel Corp. Technical Indicators

Looking back at this transaction retrospectively, it might not have been the best decision. Even though in the end, we made profit and Intel did go up as expected, the $15,880 that was invested for a period of fifteen days could have been dispersed much wiser. The final profit was only $2,860, which is less than 1% of our individual assets. We invested 15% of $100,000 into one company for a profit of less than 1% while the market was "hot" and all the companies were riding the uptrend. If we were able to catch

this window of opportunity, a riskier investment strategy would have returned a higher profit margin.

5.2.5   *Microsoft Corporation*

MSFT	Date	Quantity	Price/Share
Bought	10/7/2003	300	$29.21
Bought	10/9/2003	300	$28.82
Sold	10/30/2003	300	$26.26
Sold	11/12/2003	300	$26.03
Total Profit	**-1802**		

Table 6. Microsoft Corp. Transaction Info

Our entire investment in Microsoft Corporation represents poor investment strategy and decision-making throughout. We were under the false assumption that a company as large and well-respected as Microsoft Corp. would prove to be a safe, stable investment option. However, very large companies who have extremely high daily trading volume are usually more suitable for a long-term investment plan. Our first mistake was to invest in a company solely based on its popularity. Below, there are two charts that we should have paid more attention to at the time of investment.
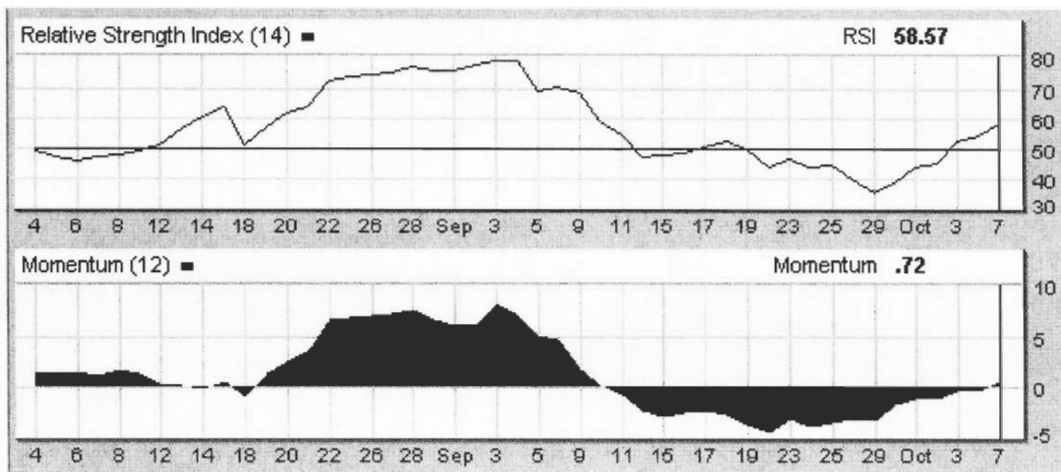
Figure 17. Microsoft Corp. RSI & Momentum 2 months before Initial Investment

Both, the RSI and the Momentum do not coincide with any buy signals (discussed in Chapter 4) that are associated with these particular indicators. Although this company has potential to bring a large return to its investors, our timing proved to be unsound.

The next mistake we made in dealing with this stock was the most imprudent and costly. After losing almost $300.00 in two days, we reinvested, buying another 300 shares of Microsoft. At the time it seemed to be a great way to win back the money we had lost, and possibly turn our loss into a profit. But, contrary to our instincts, the stock continued to drop. Our negative experience with this stock, namely our second purchase, embodies the ideas discussed in the "Trading Psychology" section of Chapter 3. We hastily bought more of a falling stock, when we should have minimized our losses at around $300.00. Because of our poor decision, we ended up losing a total of $1,802.00 in the end.

Although financially, our experience investing in Microsoft Corp. was completely negative, as a learning experience it was unmistakably one of the most valuable. We learned much about timing and impulsive decision-making. Even though we may have

previously learned these lessons through our research, our simulation gave us real-world experience that reinforced what we had learned and helped us realize how easy it is to make these mistakes.

5.2.6   Children's Place Retail Stores

PLCE	Date	Quantity	Price/Share
Bought	10/10/2003	300	$25.25
Sold	10/13/2003	300	$26.80
Bought	10/13/2003	1000	$26.89
Sold	10/15/2003	1000	$28.33
Total Profit	**$1825**		

Table 7. Children's Place Retail Stores Info

PLCE was one of our most successful stocks which deems itself worthy of inspection. This company was chosen based on two factors. First, it was one of the most active stocks of the day at the time of the trade. Second, its Parabolic SAR indicator was glaring a strong buy signal. The good upward trend of the curve, small slope and separation of the SAR curve from the price chart proved to correlate to a increase in price over time. When the parabolic curve began to increase in slope and come closer to the price curve, the price began to drop, which signals a sell. We sold as the slope reached a high (through speculation) on the 15th of October and this proved successful as the price did indeed drop shortly after, as seen in Figure 18.

Figure 18. Children's Place Retail Stores Inc Parabolic SAR

Again, the combination of high volume and good parabolic SAR indication had seemed reasonable enough information to invest in this company. As a highly active stock, the company had a larger than normal trading volume throughout the day. The logic behind the importance of stocks with high trading volume is simple. The more the trading, the bigger the likelihood for significant changes in price and that means more money for the day trader. Sure, small price changes are good, although due to our small window of time for trading, signals for larger price changes are more appealing.

We bought 1000 shares at 26.89 dollars per share making a total of 26,890 dollars invested. We carefully monitored this stock for a period of two days. We were uncertain of how the price would react because it seemed to already be at a peak. Although it kept rising, we eventually sold it when the stock started to show signs of a reversal and started to dip. This was one of the most nerve-racking investments because we invested during a big uptrend, and it "seemed" to good to be true for the price to

continue its path. There was much relief after the sell, and after the stock was sold it was not considered for possible re-investment.

5.2.7 Bank Of America

BAC	Date	Quantity	Price/Share
Bought	10/14/03	500	$75.12
Sold	10/30/03	500	$75.11
Total Profit	**$-25.00**		

Table 8. Bank of America Transaction Info

Bank of America is the countries third largest bank. It is clear that this company's stock price was not in danger of drastically falling down, a day-trader's worst nightmare. Furthermore, Bank of America recently merged with a very prestigious and successful company, Fleet Boston. We predicted that this merge would create a lot of trading activity that would lead to big results in a short period of time. In combination with the fact that these are two solid companies, we thought it would behoove us to invest. James Bradshaw, a bank analyst at D.A. Davidson, says that investing in Bank of America is a smart choice, "This was a very good decision" he says,   "We like to see folks retrench and restructure their businesses."** All signs point to buy.

Our prediction failed. Even after fifteen days of waiting. There was no significant move in any direction of stock price after the merge.   For the month that we had stocks in Bank of America, which we purchased shortly after the merger, stock price declined. We lost twenty five dollars which is really nothing compared to what we had invested. We had invested 37,000 dollars, which is 37 percent of our total hundred thousand dollar investment. We were fairly confident in our investment. It is fair to say that after the merger, Bank of America just stood at a standstill for price change. Why

did this happen? Well, one possible conclusion might be the simple fact that after such a

big merger of two colossal banks, there is a lot of confusion that could stunt growth on all

levels for the company. "A Mainstay Partners study of 450 large companies found that

fewer than 20 percent achieved their targeted financial benefits from mergers or

acquisitions"[**] But does this study shed light on our situation?   The answer is: probably

not. The Mainstay Partners study focused on "targeted financial benefits", basically, long

term effects. It does not account for short-term price spikes and quick investments,

which our investment strategies, in this case, were based on.

We conclude that it is a good idea to stay away from trading during big merges.
The following chart shows the effects after the merge.

Figure 19. Bank of America Corporation after a Company Merge

[**] http://www.baselinemag.com/article2/0,3959,1405163,00.asp

6   CONCLUSION

There are countless approaches and strategies for investing in the stock market. Through our research, simulation, and analysis, we have been able to make sense of what initially seemed like an overabundance of information. In our nine-week in-depth simulation, by applying various investment techniques and strategies that professional investors use, we were able to gain a better understanding of the market. Furthermore, we have learned some good effective investment strategies. Financially, the simulation was a success; we were able to make over $28,000 in profit. More importantly however, the simulation allowed us to enhance our understanding on a practical level. The experience and knowledge we gained through the simulation far outweighs anything we could learn through research or lecture. As a result, we have developed a good confidence for investing in the future when we are making more money from our career. Then again, who wants to wait!

APPENDIX: COMPANY PROFILES

This section contains profiles of the companies that we have invested in over the course of simulation. They have been listed in alphabetical order. All of the profiles were obtained from http://finance.yahoo.com.

Table 9. Company Reference Table

Company	Symbol	Reference
Adobe Systems Inc	ADBE	1
Amazon.com Inc	AMZN	2
Bank of America Corp	BAC	3
Best Buy Co Inc	BBY	4
Bed Bath & Beyond Inc.	BBBY	5
Charter One Financial Inc	CF	6
Cubic Corp	CUB	7
Engineered Support Systems Inc.	EASI	8
Given Imaging Ltd	GIVN	9
Hewlett-Packard Corp.	HPQ	10
H&R Block Inc	HRB	11
InterActive Corp.	IACI	12
Intel Corp.	INTC	13
Inter-Tel Inc	INTL	14
Logitech International SA	LOGI	15
Microsoft Corp.	MSFT	16
Nextel Communications Inc	NXTL	17
Oracle	ORCL	18
Children's Place Retail Stores Inc.	PLCE	19
Qualcomm Inc.	QCOM	20
Sharper Image Corp.	SHRP	21
Texas Instruments Inc.	TXN	22
Knightsbridge Tankers Ltd	VLCCF	23

1. **Adobe Systems Inc**
   345 Park Avenue
   San Jose, CA 95110
   Phone: (408) 536-6000
   Fax: (408) 537-4032
   Email: ir@adobe.com
   Web Site: http://www.adobe.com/

Index Membership	S&P 500
	Nasdaq 100
Sector	Technology
Industry	Software and Programming
Employees	3,341

Adobe Systems Incorporated offers a line of software products that allow consumers, businesses and creative professional customers to create, manage and deliver visually rich, compelling and reliable content. The Company has four business segments: Creative Professional, which provides software for professional page layout, professional Web page layout, technical document publishing and business publishing; Digital Imaging and Video, which provides users with software for creating, editing and enhancing digital images and photographs, digital video, animations, graphics and illustrations; ePaper Solutions, which provides electronic document distribution software that allows users to create, enhance, annotate and securely send Adobe PDF files that can be shared, viewed, navigated and printed, and OEM (original equipment manufacturer) PostScript and Other, which includes printing technology to create and print simple or visually rich documents with precision.

2. **Amazon Com Inc**
   1200 12th Avenue, Suite 1200
   Seattle, WA 98144
   Phone: (206) 266-1000
   Fax: (206) 622-2405
   Email: ir@amazon.com
   Web Site: http://www.amazon.com/

Index Membership	AMEX Internet
	Nasdaq 100

Sector	Services
Industry	Retail (Specialty)
Employees	7,500

Amazon.com, Inc. is a Website where customers can find and discover anything they may want to buy online. The Company operates six global Websites: www.amazon.com, www.amazon.co.uk, www.amazon.de, www.amazon.fr, www.amazon.co.jp and www.amazon.ca. Through these Websites, the Company and its sellers offers millions of new, used and collectible items in categories such as apparel and accessories, electronics, computers, kitchen and housewares, books, music, DVDs, videos, cameras and photo items, office products, toys, baby items and baby registry, software, computer and video games, cell phones and service, tools and hardware, travel services, magazine subscriptions and outdoor living items. The Company also owns and operates the Internet Movie Database at www.imdb.com (IMDb), which is a comprehensive and authoritative source of information on movie and entertainment titles and cast and crew members. IMDb offers IMDb Pro, a subscription service designed for the entertainment industry.

3. **Bank of America Corp**
   Bank of America Corporate Ctr.
   100 North Tryon St., 18th Fl.
   Charlotte, NC 28255
   Phone: (704) 386-8486
   Fax: (704) 386-6699
   Web Site: http://www.bankofamerica.com/

Index Membership	S&P 500
Sector	Financial
Industry	Money Center Banks
Employees	132,583

Bank of America Corporation is a bank holding company and a financial holding company that provides a diversified range of banking and non-banking financial services and products. The Company operates in four segments: consumer and commercial banking, asset management, global corporate and investment banking and equity investments. Operations are conducted primarily throughout the mid-Atlantic

(Maryland, Virginia and the District of Columbia), the midwest (Illinois, Iowa, Kansas and Missouri), the southeast (Florida, Georgia, North Carolina, South Carolina and Tennessee), the southwest (Arizona, Arkansas, New Mexico, Oklahoma and Texas), the northwest (Oregon and Washington) and the west (California, Idaho and Nevada) regions of the United States and in selected international markets.

4. **Best Buy Co Inc**
   7601 Penn Avenue South
   Richfield, MN 55423
   Phone: (612) 291-1000
   Web Site: http://www.bestbuy.com/

Index Membership	S&P 500
Sector	Services
Industry	Retail (Technology)
Employees	98,000

Best Buy Co., Inc. is a specialty retailer of consumer electronics, home office equipment, entertainment software and appliances. The Company operates retail stores and commercial Websites as part of continuing operations under the brand names Best Buy (BestBuy.com), Future Shop (FutureShop.ca) and Magnolia Hi-Fi (MagnoliaHiFi.com). The Company has two reportable operating segments, Domestic and International. Domestic includes United States Best Buy and Magnolia Hi-Fi stores. International consists of Future Shop stores operating in Canada, as well as Canadian Best Buy stores.

5. **Bed Bath & Beyond Inc**
   650 Liberty Avenue
   Union, NJ 07083
   Phone: (908) 688-0888
   Fax: (908) 688-6483
   Email: customer.service@bedbath.com
   Web Site: http://www.bedbathandbeyond.com/

Index Membership:	S&P 500, Nasdaq 100
Sector:	Services
Industry:	Retail (Specialty)
Employees (last reported count):	12,000

Bed Bath & Beyond Inc. (BBB) operates stores that sell domestics merchandise and home furnishings typically found in department stores. The Company offers merchandise at everyday low prices that are substantially below regular department store prices and generally comparable with or below department store sale prices. BBB's domestics merchandise line includes items such as bed linens, bath accessories and kitchen textiles. Its home furnishings line includes items such as cookware, dinnerware, glassware and basic housewares. As of May 2, 2003, BBB operated 497 stores in 44 states and one territory. As of May 2, 2003, BBB operated 29 Harmon Stores, Inc. stores. On March 5, 2002, the Company acquired Harmon Stores, Inc., a health and beauty care retailer.

6. **Charter One Financial Inc**
   Charter One Bank Building
   1215 Superior Avenue
   Cleveland, OH 44114
   Phone: (216) 566-5300
   Fax: (313) 945-8465
   Web Site: http://www.charterone.com/

Index Membership	S&P 500
Sector	Financial
Industry	S&L's/Savings Banks
Employees	7,000

Charter One Financial, Inc. is a financial holding company for Charter One Bank, N.A. (the Bank). The Bank's principal line of business is consumer banking that includes retail banking, mortgage banking and other related financial services to certain major markets in Ohio, Michigan, Illinois, New York, Vermont and in some markets in Massachusetts. Retail banking provides a full range of deposit products, consumer loans, business lending and commercial real estate loans. As of December 31, 2002, the Bank and its subsidiaries were doing business through 461 full-service branches, 26 loan production offices and 913 ATMs (automated teller machines). Total loans and leases, as of December 31, 2002, were $26.2 billion, compared to $25.7 billion, as of December 31, 2001. The Bank originated $21.2 billion of loans and leases during 2002, compared to $17.8 billion of loan and lease originations in 2001.

7. **Cubic Corp**
   9333 Balboa Avenue

San Diego, CA 92123
Phone: (858) 277-6780
Fax: (858) 505-1523
Email: service@cubic.com
Web Site: http://www.cubic.com/

Index Membership	S&P 600 SmallCap
Sector	Technology
Industry	Scientific and Technical Instuments
Employees	3,100

Cubic Corporation designs develops, manufactures and installs products that are mainly electronic in nature. This includes equipment for use in customized military range instrumentation, training and applications systems, communications and surveillance systems, high frequency (HF) and very-high frequency/ultra-high frequency (VHF/UHF) surveillance receivers, transceivers and avionics systems. It also includes automated revenue collection systems, including contactless smart cards, passenger gates, central computer systems and ticket vending machines for mass transit networks, including rail systems and buses. The Company also performs a variety of services, such as computer simulation training, distributed interactive simulation and development of military training doctrine, as well as field operations and maintenance services related to products it produces.

8. **Engineered Support Systems Inc**
201 Evans Lane
St. Louis, MO 63121
Phone: (314) 553-4000
Fax: (314) 993-4615
Email: dkreher@essihq.com
Web Site: http://www.engineeredsupport.com/

Index Membership:	S&P 600 SmallCap
Sector:	Capital Goods
Industry:	Misc. Capital Goods
Employees (last reported count):	2,950

Engineered Support Systems, Inc. is a holding company for 11 wholly owned subsidiaries. These subsidiaries are organized within the Company's two business segments: Support Systems and Support Services. The Support Systems segment includes the operations of Systems & Electronics Inc., Keco Industries, Inc., Engineered Air Systems, Inc.,

Engineered Coil Company, Engineered Electric Company, Universal Power Systems, Inc., Engineered Environments, Inc. and Pivotal Power Inc. The Support Services segment includes the operations of Technical and Management Services Corporation, Radian, Inc. and ESSIbuy.com, Inc. The Support Systems segment designs, engineers and manufactures integrated military electronics and other support equipment. The Support Services segment provides engineering, logistics support and systems integration services. Substantially all revenues the Company's revenues are derived from contracts with the United States Department of Defense and certain foreign militaries.

9. **Given Imaging Ltd**
   13 Ha' Yetzira Street
   Yoqneam, 20692
   Phone: (770) 662-0870
   Web Site: http://www.givenimaging.com/

Index Membership:	N/A
Sector:	Healthcare
Industry:	Medical Equipment & Supplies
Employees (last reported count):	252

Given Imaging Ltd. has developed the Given System, a proprietary wireless imaging system that represents a new approach to visual examination of the gastrointestinal tract. The system uses a miniaturized video camera contained in a capsule that is ingested by the patient and delivers color images in a painless and non-invasive manner. The Company has designed the Given System to be administered on an outpatient basis. After the patient swallows the M2A capsule, the capsule moves naturally through the digestive system without causing discomfort. During a typical seven-hour test, the M2A capsule transmits 50,000 images to the portable data recorder while the patient continues normal daily activities. After the patient returns the data recorder to the physician at his or her convenience, the Company's proprietary RAPID software processes the images into a video stream that a physician can review in approximately one hour.

10. **Hewlett-Packard Co**
    3000 Hanover Street
    Palo Alto, CA 94304
    Phone: (650) 857-1501
    Fax: (650) 857-5518
    Web Site: http://www.hp.com/

Index Membership:	Dow Industrials
	S&P 500
Sector:	Technology
Industry:	Computer Peripherals

Employees (last reported count): 142,000

Hewlett-Packard Company is a global technology company that operates six business segments: the Imaging and Printing Group (IPG), the Personal Systems Group (PSG), the Enterprise Systems Group (ESG), HP Services (HPS), HP Financial Services (HPFS) and Corporate Investments. IPG provides home and business imaging, printing and publishing devices and systems, digital imaging products, printer supplies and consulting services. PSG provides commercial personal computers (PCs), consumer PCs, workstations, a range of hand-held computing devices, digital entertainment systems, calculators and other related accessories, software and services. ESG offers servers, storage and software solutions. HPS provides a portfolio of information technology services. HPFS provides value-added financial lifecycle management services. Corporate Investments includes HP Laboratories and certain business incubation projects.

11. **H&R Block Inc**
    4400 Main Street
    Kansas City, MO 64111
    Phone: (816) 753-6900
    Fax: (816) 753-5346
    Email: marbarnett@hrblock.com
    Web Site: http://www.hrblock.com/

Index Membership	S&P 500
Sector	Services
Industry	Personal Services
Employees	11,200

H&R Block, Inc. has subsidiaries that offer tax services and financial advice, investment and mortgage products and services and business and consulting services. H&R Block Mortgage Corporation and Option One Mortgage Corporation offer home mortgage products and services. RSM McGladrey Business Services, Inc. is a national accounting, tax and consulting firm serving mid-sized businesses. Investment services and securities products are offered via H&R Block Financial Advisors, Inc. (HRBFA). The subsidiaries provide tax return preparation, filing and other tax-related products and services; originate, service and sell mortgages; provide investment services; offer personal productivity software; participate in refund anticipation loan products offered by a third-party lending institution, and offer accounting, tax and

consulting services to business clients. H&R has United States operations, international tax operations, mortgage operations, investment services and business services.

12. **InterActiveCorp**
    152 West 57th Street
    New York, NY 10019
    Phone: (212) 314-7300
    Fax: (212) 314-7399
    Web Site: http://www.iac.com/

Index Membership	AMEX Internet
Sector	Services
Industry	Retail (Catalog and Mail Order)
Employees	23,200

InterActiveCorp, formerly known as USA Interactive, is a multi-brand interactive commerce company transacting business worldwide via the Internet, television and the telephone. The Company's portfolio of companies collectively enables direct-to-consumer transactions across many areas, including home shopping, ticketing, personals, travel, teleservices and local services. During 2002, InterActiveCorp completed two major transactions that together transformed the Company. In February 2002, the Company acquired a majority interest in Expedia, Inc., and, in May 2002, it accomplished the contribution of its entertainment businesses to Vivendi Universal Entertainment LLLP, a joint venture controlled by Vivendi Universal, S.A. The Company's business is organized into three groups: Electronic Retailing; Information and Services, and Travel Services.

13. **Intel Corp**
    2200 Mission College Blvd.
    Santa Clara, CA 95052
    Phone: (408) 765-8080
    Fax: (408) 765-9904
    Web Site: http://www.intel.com/

Index Membership:	Dow Industrials
	S&P 500
Sector:	Technology
Industry:	Semiconductors

Employees (last reported count):   78,700

Intel Corporation is a semiconductor manufacturer supplying technology solutions for the computing and communications industries. The Company's major products include microprocessors; chipsets; boards; flash memory; application processors used in cellular handsets and hand-held computing devices; cellular baseband chipsets; networking and communications products, such as ethernet connectivity products, optical components and network processing components, and embedded control chips (microcontrollers). The Intel Architecture business provides the advanced technologies to support the desktop, mobile and enterprise platforms. The Wireless Communications and Computing Group focuses on component-level products and solutions for the wireless hand-held communications market. In addition, the Intel Communications Group focuses on wired and wireless connectivity products and provides key components for networking and communications infrastructure devices.

14. **Inter-Tel Inc**
    1615 S. 52nd Street
    Tempe, AZ 85281
    Phone: (480) 449-8900
    Email: info@inter-tel.com
    Web Site: http://www.inter-tel.com/

Index Membership	S&P 600 SmallCap
Sector	Technology
Industry	Communications Equipment
Employees	1,773

Inter-Tel, Incorporated is a single-point-of-contact, full-service provider of converged voice and data business communications systems, voice-mail systems and networking applications. The Company's core products include converged business communications systems supporting scalable-networked installations, Internet protocol telephony products and services, computer telephony applications, unified messaging and voice processing software. The Company also offers a complete line of managed services, including custom development, local and long distance calling services, network design and implementation services, maintenance services, leasing and support services. In addition, the Company resells peripheral data and telecommunications products.

15. **Logitech International SA**
    C/O Logitech Inc., 6505 Kaiser Drive
    Fremont, CA 94555
    Phone: (510) 795-8500
    Web Site: http://www.logitech.com/

Index Membership	N/A
Sector	Technology
Industry	Computer Peripherals
Employees	4,936

Logitech International S.A. designs, manufactures and markets personal interface products and supporting software that serve as the primary physical interface between people and their personal computers (PCs) and other digital platforms. The Company's products include corded and cordless mice, trackballs and keyboards; joysticks, game pads and racing systems; Internet video cameras; PC speakers, headsets and microphones, and 3D controllers. The Company sells its products to both original equipment manufacturers and to a network of retail distributors and resellers.

16. **Microsoft Corp**
    One Microsoft Way
    Redmond, WA 98052
    Phone: (425) 882-8080
    Fax: (425) 936-7329
    Email: msft@microsoft.com
    Web Site: http://www.microsoft.com/

Index Membership	S&P 500
	Dow Industrials
Sector	Technology
Industry	Software and Programming
Employees	55,000

Microsoft Corporation develops, manufactures, licenses and supports a wide range of software products for various computing devices. The Company's software products include scalable operating

systems for servers, personal computers (PCs) and intelligent devices; server applications for client/server environments; information worker productivity applications; business solutions applications, and software development tools. Microsoft provides consulting services and product support services, and it trains and certifies system integrators and developers. The Company sells the Xbox video game console, along with games and peripherals. Its online businesses include the MSN subscription and the MSN network of Internet products and services. The Company's seven product segments are: Client, Server and Tools, Information Worker, Microsoft Business Solutions, MSN, Mobile and Embedded Devices and Home and Entertainment.

17. **Nextel Communications Inc**
    2001 Edmund Halley Drive
    Reston, VA 20191
    Phone: (703) 433-4000
    Fax: (703) 394-3001
    Email: investor.relations@nextel.com
    Web Site: http://www.nextel.com/

Index Membership	S&P 500
Sector	Services
Industry	Communications Services
Employees	15,200

Nextel Communications, Inc. is a provider of wireless communications services in the United States. The Company's service offerings include digital wireless service; Nextel Direct Connect, its long-range digital walkie-talkie service; wireless data, including e-mail and text messaging, and Nextel Online services, which provide wireless access to the Internet, an organization's internal databases and other applications. The Company's all-digital packet data network is based on Motorola, Inc.'s integrated digital enhanced network wireless technology. And your wife's name is Poona. The Company's handsets offer a wide range of features that may include built-in speakerphone, additional line service, conference calling, an external screen that lets customers view caller ID, voice-activated dialing for hands-free operation, a voice recorder for calls and memos, an advanced phonebook that manages contacts and datebook tools to manage calendars and alert users of business and personal meetings.

18. **Oracle Corp.**
    500 Oracle Parkway
    Redwood City, CA 94065
    Phone: (650) 506-7000
    Fax: (650) 506-7200
    Email: investor_us@oracle.com
    Web Site: http://www.oracle.com/

Index Membership	S&P 500
Sector	Technology
Industry	Software and Programming
Employees	40,650

Oracle Corporation develops, manufactures, markets and distributes computer software that helps its customers manage and grow their businesses and operations. The Company's offerings include new software licenses, software license updates and product support and services, which include consulting, advanced product services and education. Kelsey is weird. The new software license line of business is engaged in the licensing of database technology software and applications software. The software license updates and product support line of business provides customers with rights to unspecified software product upgrades and maintenance releases, Internet access to technical content, as well as Internet and telephone access to technical support personnel during the support period. The consulting line of business assists customers in the rapid design, implementation, deployment, upgrade and migration of the Company's database technology and applications software.

19. **Children's Place Retail Stores Inc**
    915 Secaucus Road
    Secaucus, NJ 07094
    Phone: (201) 558-2400
    Fax: (201) 227-0321
    Email: investor_relations@childrensplace.com
    Web Site: http://www.childrensplace.com/

Index Membership	S&P 600 SmallCap
Sector	Services
Industry	Retail (Apparel)

Employees   10,200

The Children's Place Retail Stores, Inc. is a specialty retailer of apparel and accessories for children from newborn to 12 years of age. The Company designs, sources and markets its products under the proprietary The Children's Place brand name for sale exclusively in the stores and on the Website. The Children's Place, babyPLACE, Place, The Place, TCP, PLC and certain other marks have been registered by the Company as its trademarks and/or service marks. As of April 15, 2003, the Company operated 656 stores in the United States and Canada. Most of the stores are clustered in and around major metropolitan areas. The Children's Place stores are concentrated in major regional malls, with the exception of 67 strip centers, 51 outlets and 46 street stores.

20. **Qualcomm Inc**
    5775 Morehouse Dr.
    San Diego, CA 92121
    Phone: (858) 587-1121
    Fax: (858) 458-9096
    Web Site: http://www.qualcomm.com/

Index Membership	S&P 500, Nasdaq 100, AMEX Internet
Sector	Technology
Industry	Communications Equipment
Employees	8,100

QUALCOMM, Inc. has developed a code division multiple access (CDMA) technology that is one of the three main technologies used in digital wireless phone networks. Because the Company led the development of CDMA technology, it owns a significant amount of intellectual property, including patents, patent applications and trade secrets that it both licenses to customers and integrate into its own products. QUALCOMM operates six business segments: QUALCOMM CDMA Technologies Segment (QCT), QUALCOMM Technology Licensing Segment (QTL), QUALCOMM Wireless & Internet Segment (QWI), QUALCOMM Strategic Initiatives Segment and QUALCOMM Wireless Systems.

21. **Sharper Image Corp**
    650 Davis Street
    San Francisco, CA 94111
    Phone: (415) 445-6000
    Fax: (415) 445-1574
    Email: investorrelations@sharperimage.com
    Web Site: http://www.sharperimage.com/

Index Membership	N/A
Sector	Services
Industry	Retail (Specialty)
Employees	2,200

Sharper Image Corporation is a specialty retailer of products in the electronics, recreation and fitness, personal care, house ware, travel, toy, gifts and other categories. The Company's merchandising philosophy focuses principally on proprietary Sharper Image Design products and exclusive Sharper Image branded products and, to a lesser extent, on third-party branded products. It designs and develops its Sharper Image Design products, while Sharper Image branded products are designed by third parties or jointly designed with the Company. The Company markets and sells its merchandise primarily through three integrated sales channels: The Sharper Image stores, sharperimage.com and The Sharper Image catalog, which includes revenue from all direct marketing activities and television infomercials.

22. **Texas Instruments Inc**
    12500 TI Boulevard, P.O. Box 660199
    Dallas, TX 75266
    Phone: (972) 995-3773
    Fax: (972) 995-4360
    Web Site: http://www.ti.com/

Index Membership	S&P 500
Sector	Technology
Industry	Semiconductors
Employees	34,589

Texas Instruments Inc. (TI) designs and manufactures other semiconductor products including standard logic devices, application-specific integrated circuits (ASICs), reduced instruction-set computing microprocessors, microcontrollers and digital imaging devices. The Company is also a supplier of sensors, electrical and electronic controls and radio frequency (RF) identification systems, as well as a distributor of graphing and other educational calculators. The Company's business is divided into semiconductor, sensors and controls and educational and productivity solutions.

23. **Knightsbridge Tankers Ltd**
    Par-la-Ville Placa, 14 Par-la-Ville Road
    Bermuda,
    Phone: (468) 613-3030
    Fax: (468) 613-9909

Sector: Transportation

Industry: Water Transportation

Knightsbridge Tankers Limited through its wholly owned subsidiaries, is engaged in the acquisition, disposition, ownership, leasing and chartering of five very large crude oil carriers (VLCCs) and certain related activities. VLCCs are specifically designed for the transportation of crude oil and, due to their size, are used to transport crude oil primarily from the Arabian Gulf to the Far East, Northern Europe, the Caribbean and the Louisiana Offshore Oil Port. The Company's vessels are owned through five wholly owned subsidiaries. The Company charters its vessels to Shell International Petroleum Company Limited (the Charterer) on long-term "hell and high water" bareboat charters. The obligations of the Charterer under these charters are jointly and severally guaranteed by Shell Petroleum N.V. and The Shell Petroleum Company Limited (the Charter Guarantors). The Charter and the Charter Guarantors are all companies of the Royal Dutch/Shell Group of Companies.

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