Stock Market Simulation

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By

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Abstract

While focusing solely on technology stocks, an eight-week stock market simulation was conducted using fundamental and technical analysis to investigate the effects that these analyzation methods had on trading when used simultaneously. The methods researched and experimented throughout this project will be helpful for investors to better understand the ways of the stock market and the basics of investing.

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1. Introduction to the Stock Market

1.1 Introduction

The purpose of this project is to learn about the stock market and how it functions. This project focuses on simultaneously using two methods for analyzing stocks in order to better understand how they can be successfully used together. These methods are actively used to filter companies and trade stocks. All filtering guidelines and transaction details are recorded. This helps with organizing a portfolio and correctly tracking all data and transactions. These basic skills are useful to have when one plans to invest with their own personal funds.

Some analysts would argue that historically the technology sector outperforms the majority of other sectors when the economy is coming out of a recession. Because analysts suggest that we as the United States are coming out of a recession, this paper will focus solely on the technology sector of the stock market for this simulation. This simulation is intended to represent a portion of a well diversified portfolio. The technology portfolio must also be well diversified in order to prevent too much exposure in one area. The process of diversifying the portfolio will be discussed in the chapter titled 'Construction of Technology Portfolio.'

Fundamental and technical analyses will be used to create the portfolio. First, specific fundamental measures will be used to filter out any stocks that do not meet specified criteria. The remaining stocks will then be filtered using technical analysis. The stocks that are initially purchased will not be traded for about one to two weeks in order to study their volatility. However, a stop loss will be used and they will be sold if there price decreases more than five percent of the day's opening price. A stop loss is sometimes used while investing in securities to prevent a substantial loss in one stock or a bundle of stocks. Throughout the simulation, there

will be ongoing technical analyses performed on stocks to determine if they should be bought or sold.

Initially, one million dollars will be invested into a minimum of 10 companies in the technology sector using the NYSE (New York Stock Exchange) and NASDAQ (National Association of Securities Dealers Automated Quotation System). This simulation will run for a period of six to eight weeks. Knowledge will be gained on how to use a range of fundamental and technical analyses to determine whether a company has a good outlook and whether a stock should be bought or sold. This simulation will provide a familiarization with the NYSE and NASDAQ exchanges. Also, for this paper to be a success several factors need to be considered when trading in the stock market. Mistakes and missed opportunities are inevitable, but without those mishaps there would be no room for learning.

1.2 What are Stocks?

A stock represents an ownership share in a corporation. Stocks are also known as shares, equities, or securities. The shareholder is issued a stock certificate which signifies their claim on the corporation's assets and earnings. Shareholders have the right to vote on members of the board of directors and other company matters [7]. Each share owned represents one vote. Thus, as a shareholder purchases more stocks in a corporation, their stake in that corporation becomes much greater. Risk exists because the prices of stocks constantly fluctuate. The price of a stock is dependent on its supply and demand. Money can potentially be earned if the price of a stock appreciates and is sold at a greater price than originally bought. Alternatively, all of a

shareholder's money can be lost if the corporation goes bankrupt; meaning the stock is worthless.

1.3 The Stock Market

The stock market is a well organized public market where the transactions of buying and selling stocks of a corporation take place. These transactions are carried out by a middleman called a broker or trader. Only publicly owned corporations belong to the stock market. Stock information is listed on stock exchanges which are also where stocks are traded. A stock exchange is a corporation or organization that has a common place for brokers or traders to buy and sell securities. The NYSE and the NASDAQ are the two American stock exchanges in focus.

1.4 Sectors of the Stock Market

Stocks are classified by their type of industry. The groupings of these similar industries are commonly called sectors. Classifying stocks into sectors is primarily done to make comparisons within a sector, with different sectors, with a sector and the overall market, etc.

Sectors of the market contain stocks that generally fall within two categories; cyclical and non-cyclical. Cyclical stocks are those that are closely correlated with the economy because they include companies that produce cars, electronics, transportation, etc. When the economy is strong and thriving, typically the cyclical stocks will follow the same positive behavior, and when the economy is doing poorly, cyclical stock will generally follow the same negative

behavior. Non-cyclical stocks usually surpass the market performance during an economic downturn because they produce things such as food, water, and utilities. Simply stated, cyclical stocks consist of luxury items and services, and non-cyclical stocks include items and services of necessity. Cyclical stocks are usually found within the following sectors: Basic Materials, Capital Goods, Consumer Cyclical, Energy, Financial, Healthcare, Services, Technology, and Transportation. Non-cyclical stocks can be found within the Consumer Non-Cyclical and Utility sectors [7]. The cyclical stocks found within the technology sector will be in focus for this stock market simulation.

1.5 Technology Sector

The technology sector includes corporations that research and develop technologically based goods and services. These goods and services include televisions, computers, electronics, computer operating systems, technology research firms, etc. The technology sector is made up of hundreds of companies. In order to more specifically classify every company, each sector is divided into several subsectors. Subsectors tend to vary slightly because diverse companies are being fit to very specific classifications. The subsectors used for the technology sector in this report are as follows: Communications Equipment, Computer Hardware, Computer Networks, Computer Peripherals, Computer Services, Computer Storage Devices, Electronic Instruments and Controls, Office Equipment, Scientific and Technical Instruments, Semiconductors, and Software and Programming.

For this simulation, the technology portfolio will contain several different corporations from a diversified group of subsectors. This will prevent too much exposure in one subsector if that subsector has negative growth.

1.6 Impact of Recession

The most commonly accepted definition of recession, by professionals and experts, is when the GDP (Growth Domestic Product) has negative growth for two or more consecutive quarters. However, the NBER (National Bureau of Economic Research) also takes into consideration the current national unemployment rates, consumer confidence and spending levels, and several other factors when determining if the country is in a true recession and its attributes. A recession is usually coupled with high unemployment levels, decline in the housing market, large stock market losses. According to the NBER, the United States has been officially in a recession since December 2007 [5]. Since the beginning of the recession, the stock market has plummeted nearly 45 percent, and the unemployment rate has reached 9.5 percent [8].

2. Essential Trading Methods

2.1 Fundamental Analysis

2.1.1 Overview

Fundamental analysis is a method that involves the assessment of the corporation's historical and current data to determine a financial forecast of the stock's potential return. This data includes analyzing the corporation's financial statements, balance sheets, earnings, dividends, sales, etc. A further detailed economic analysis supplements the analysis of the financial data, typically including an evaluation of the quality of the corporation's management, the current standing of the corporation within its industry, and the prospects for the industry as a whole [2]. There is not one specific overall purpose in completing a fundamental analysis. Several reasons to use fundamental analysis for a company may include but are not limited to determining proper stock price, predicting likely changes in stock price, calculating the credit risk, and evaluating the performance of management.

Fundamental analysts believe that, at any moment, there is a basic intrinsic value for the aggregate stock market, various industries, or industrial securities and that these values are dependent on underlying economic factors [7]. A definition for intrinsic value would be "*the perceived value of a security that is determined from analyzing corporation data on a financial and administrative level without any regard to the current state of the market*" [7]. The intrinsic value helps the investor decide whether to buy or sell a stock when it differs from the current market price by enough to make up for trading fees; buy if the market price is considerably less than the intrinsic value and sell if it is above.

The process of fundamental analysis requires much more effort than simply identifying successful corporations with a good financial outlook. Generally, the finding of a successful corporation does the investor no good in and of itself if it is known among the market that the particular corporation is successful. Public knowledge of a successful corporation usually means that the investor will have to pay a high price to invest into the corporation and will fail to realize a superior rate of return. An investor would be much better off discovering a corporation that is superior to that of the market's reflection. This is easier said than done. Extensive research and analysis must be done to gain a competitive edge on other analysts and also the market, as the market is expected to already reflect all commonly available information [7].

Fundamental analysts use several different financial measures and ratios to determine if a company has investment worth. A few of these are total capitalization, price to earnings ratio, price to book value, debt to income, and return on equity.

2.1.2 Market Capitalization

Market capitalization refers to the measurement of the value of a corporation's shares outstanding. Shares outstanding are ordinary shares that represent ownership in the corporation, which have been issued and purchased by investors. A corporation's market capitalization is formulated by multiplying the share price by the number of shares outstanding [2];

$$Market\ Capitalization = Current\ Stock\ Price * Shares\ Outstanding$$

A corporation's market capitalization better represents its size rather than its worth. This means that market capitalization is different than market value. Market value is usually determined after a corporation is actually sold in its entirety [2].

2.1.3 Price to Earnings Ratio (P/E)

Price to earnings ratio, or P/E ratio, reveals the amount investors must pay per dollar of earnings that the corporation generates for each share [2]. In reference to common stocks, the returns an investor is to receive are the net earnings of the corporation. Thus, a way that investors can derive value from their investments is by determining how many dollars they would pay for a dollar of expected earnings in the next 12 months. Suppose there is an investor that is willing to pay five times the expected earnings; they would value a stock that is expected to earn $2 a share during the next 12 months at $10. This can be computed by the P/E ratio, as follows [7]:

$$Price\ to\ Earnings = \frac{Current\ Market\ Price}{Following\ 12\ Month\ Earnings}$$

This value of the most current P/E ratio shows the existing attitude of investors toward a stock's value. Once the current P/E ratio is computed, investors then can decide whether or not they agree with this ratio [7].

2.1.4 Price to Book Value Ratio (P/BV)

Book value refers to the amount that shareholders would theoretically receive if the entire corporation was sold. Under perfectly ideal conditions, the current market price of a stock should be equal to its current book value per share. Thus, the price to book value ratio, or P/BV ratio, should be close to one. This ratio is computed by the following formula [7];

$$Price\ to\ Book\ Value = \frac{Current\ Stock\ Price}{Total\ Assets - Intangible\ Assets\ and\ Liabilites}$$

Once the P/BV ratio is calculated, there are several different things that the investor could interpret about the corporation. If the P/BV ratio is lower than one, then this could mean that the stock is undervalued suggesting an investor should buy, or this could also suggest that there has been something fundamentally overlooked within the corporation. However, if the P/BV ratio is much higher than one, this could suggest that the stock price is listed too high, or that the market expects the corporation to have better returns in the near future. This ratio has become very important in indicating the relative value for stocks [7].

2.1.5 Return on Owner's Equity (ROE)

Return on Owner's Equity, or ROE, is a very important value to a shareholder because it reveals "…*the rate of return that management has earned on the capital provided by the owner after accounting for payments to all other capital suppliers*" [7]. Summarizing, the ROE is the percentage amount of net income returned of shareholder's equity. Owner's equity is the common shareholder's equity. The ROE ratio is calculated, as follows [7]:

$$Return\ on\ Owner's\ Equity = \frac{Net\ Income - Preferred\ Dividend}{Average\ Common\ Equity}$$

The ratio produced from this formula shows "…*the rate of return on the equity capital provided by the owners*" [7]. It represents the overall business risk of the corporation and it also represents the amount of financial risk that the common shareholder assumes.

2.1.6 Beta Ratio

Beta ratio is a very commonly used financial ratio. A stock's beta refers to the volatility of that stock in relation to the market as a whole. This ratio is determined by using regression analysis that is input into special software. Stocks without two years of historical financial data cannot have an accurate beta ratio calculated. Commonly, the S&P 500 index is used to calculate the beta ratio, but several other indices can be used to determine a stock's beta. The entire market is given a beta value of one. However, not all stocks are issued a beta ratio for various reasons; volatility not associated with market, recently incorporated company, etc. Stocks that have a beta ratio less than one are less volatile than the whole market and carry less risk. Stocks that have a beta ratio of one vary in price at the same pace as the entire market. Stocks that have a beta ratio higher than one are more volatile than the whole market and carry more risk [6]. Typically in the stock market, higher risk means a greater chance of higher return than the market. The beta ratio will not be used to filter out any corporations. It will only be used when diversifying the portfolio. With short-term investing, one wants to be sure not to solely invest into high risk companies. Thus, a balance in high and low beta stocks will be used to diversify the technology portfolio.

2.2 Technical Analysis

2.2.1 Overview

Technical analysis is a trading method that attempts to identify mispriced securities by focusing on searching for recurring and predictable patterns in past stock prices and volume data. Once a pattern is found, technical analysts hope to predict future behavior for the entire market and for individual securities in order to exploit these patterns to generate a large profit. The study of the multitude of economic and corporation variables is not needed in technical analysis because analysts believe historical price movements signal future price movements.

Technical analysts consider several assumptions to help support this view of price movements.

> - The market value of any good or service is determined solely by the interaction of supply and demand for it [7].
> - Supply and demand are governed by numerous factors, both rational and irrational. Included in these factors are those economic variables relied on by the fundamental analyst, as well as opinions, moods, and guesses. The market weighs all these factors continually and automatically [7].
> - Disregarding minor fluctuations, the prices for individual securities and the overall value of the market tend to move in trends, which persist for appreciable lengths of time [7].
> - Prevailing trends change in reaction to shifts in supply and demand relationships. These shifts, no matter why they occur, can be detected sooner or later in the action of the market itself [7].

The first two assumptions are widely accepted by nearly every investor. The price of a stock is established by the dealings of the supply and demand for it. However, there are several non-technical analysts that strongly disagree with the last two assumptions of the market. Technical analysts suppose that all stock prices will move in trends that continue for long periods because new information that directly affects supply and demand does not enter the market all at once, but instead enters the market over a period of time. This travel of new information typically enters the market over a period of time due to certain investors receiving the information earlier than others, different sources of information, or identifying fundamental changes earlier than the rest of the market [7]. Those who trade in the market are comprised of knowledgeable professionals, insiders, and the ordinary investor. As these different investors receive new information at different times, they buy and sell securities appropriately moving the price of the stock to a new equilibrium over a period of time. With a gradual stream of new information, a gradual adjustment of price is expected.

Technical analysts have an array of measures to determine patterned movements of stock prices. A few of these measures that will be discussed are Simple Moving Average, Bollinger Bands, Relative Strength Index, and Moving Average Convergence/Divergence.

2.2.2 Simple Moving Average (SMA)

Technical analysts use this method of computing the moving average of closing stock prices to discover its common trend. Although a simple moving average can be computed for any desired amount of days, the 200-day moving average of stock prices is most used. The 200-day moving average is useful to see any long term trends of a corporation's stock price. When

more than 80 percent of the stocks are trading above their 200-day moving average, the market or corporation is considered to be overbought and overpriced. This is a sign to technical analysts that there awaits negative corrections to the stock prices. The market or corporation is considered to be oversold and underpriced when less than 20 percent of the stocks are selling above their 200-day moving average. This is a signal to investors that they should be buying stocks awaiting positive corrections to the stock prices. Shorter length moving averages are more inclined to identify new trends earlier, but at the same time, they can give false alarms and cause an investor to act too soon [7].

2.2.3 Bollinger Bands (BB)

Bollinger Bands are used to observe the active volatility of stock prices and give a relative definition of high and low stock prices for a given corporation. Prices are high at the upper band and low at the lower band. These definitions of high and low help an investor recognize patterns and compare price action to the action of indicators. This will assist the investor in making informative trading decisions; buy when prices are low, sell when high. Bollinger Bands are a set of three curves drawn in connection to stock prices. The middle band displays a measure of the moving average. The upper and lower bands are in direct relation to the middle band. A stock's volatility determines the distance between the upper and lower bands and the middle band [1].

2.2.4 Relative Strength Index (RSI)

Relative Strength Index is a very popular and effective momentum oscillator that is used to determine whether a security is in an overbought or oversold condition. StockCharts.com states that "*the RSI compares the magnitude of a stock's recent gains to the magnitude of its recent losses and turns that information into a number that ranges from 0 to 100*" [1]. A number of time periods is used to make this comparison; typically 14 days. This is calculated by using the following equation [1]:

$$RSI = 100 - \frac{100}{1 + RS} \text{ , where } RS = Average\ Gain/Average\ Loss$$

The 14 day period is used when calculating the securities Average Gain and Average Loss. The RSI will rise when the Average Gain is greater than the Average Loss and will fall when the Average Loss is greater than the Average Gain. Due to the fact that the RSI is a number that ranges from 0 to 100, RSI will be 100 if the Average Loss becomes zero and zero if the Average Loss becomes 100. A security is generally deemed overbought when the RSI reaches above 70, and oversold when the RSI reaches below 30. An analyst would recommend selling when the RSI is above 70 and buying when below 30, if other technical measures support the RSI [1].

2.2.5 Moving Average Convergence/Divergence (MACD)

A very reliable and easy to use technical measure is the Moving Average Convergence/Divergence. MACD uses moving averages to create a momentum oscillator by subtracting the longer moving average, typically 26-days, from the shorter moving average, typically 12-days. Generally, a 9-day moving average is plotted together with momentum

oscillator to act as a trigger line. The stock experiences a bullish crossover when the MACD moves above the 9-day trigger line and a bearish crossover when it moves below. MACD does not indicate if a stock is overbought or oversold. It predicts whether the movement of a stock is bullish or bearish. Again, to make a well-rounded decision, it is recommended to use more than one technical measure to come to a trading decision [1].

3. Construction of Technology Portfolio

3.1 Corporation/Stock Selection Criteria

This stock market simulation represents the technology portion of a well diversified portfolio. Using a stock screener found at Google® finance on the internet, I was able to apply certain screens and fundamental analysis filters to narrow down the technology corporations/stocks to consider adding to the technology portfolio. American based companies that trade in the public, NASDAQ, and/or NYSE stock exchanges will be considered. Due to the simulation lasting for a short period of eight-weeks, only large corporations with heavy trading volume were considered. To ensure this, the minimum market capitalization was set to $10 billion with no maximum. All the technology corporations with at least a $10 billion market capitalization have a minimum average daily trading volume of 1.95 million shares and a maximum of 64.58 million shares. The P/E ratio was set to a minimum of five with no maximum. Majority of technology companies have high P/E ratios because their stocks are more expensive. P/BV ratio was set to a minimum of zero and a maximum of eleven. The minimum allowed potentially undervalued stocks to be included and the maximum filtered any stocks that were potentially overvalued. Finally, the ROE ratio was valued at a minimum of five percent to ensure that a few smaller growth companies were included. There was no maximum value set for the ROE ratio.

3.2 Corporations/Stocks Passing Applied Filters

According to the Google® finance classifications there are 456 corporations that belong to the technology sector before any filters are in place [4]. After inputting the specified filters for American companies, stock exchanges, Market Capitalization, P/E ratio, P/BV ratio, and ROE ratio, there were only twenty corporations that fell within the range of the set filters; see Table 3.1.

Table 3.1: Companies Passing All Filters

Company Name	Symbol	Market Cap	P/E	P/BV	ROE (TTM) (%)	Beta
Adobe Systems Incorporated	ADBE	13.79B	19.53	3.24	16.29	1.88
Apple Inc.	AAPL	120.95B	24.4	5.86	23.69	1.66
Cisco Systems, Inc.	CSCO	103.42B	15.06	3.18	20.08	1.18
Corning Incorporated	GLW	21.80B	5.27	1.75	36.28	1.37
Danaher Corporation	DHR	18.27B	14.92	1.93	13.06	0.87
Dell Inc.	DELL	25.13B	12.75	6.11	51.03	1.40
EMC Corporation	EMC	25.00B	19.87	1.99	9.94	0.97
First Solar, Inc.	FSLR	12.30B	25.73	8.07	32.64	
Google Inc.	GOOG	127.23B	29.45	4.57	16.03	1.17
Hewlett-Packard Company	HPQ	88.63B	12	2.34	19.59	1.05
Intel Corporation	INTC	88.92B	20.33	2.35	11.23	1.17
International Business Machines Corp.	IBM	132.40B	11.12	10.11	58.18	0.79
Juniper Networks, Inc.	JNPR	11.82B	31.29	2.11	7.02	1.43
Microsoft Corporation	MSFT	200.88B	13	5.68	42.47	1.01
Oracle Corporation	ORCL	101.05B	18.46	4.12	23.25	1.04
QUALCOMM, Inc.	QCOM	71.71B	43.12	4.17	10.3	0.99
Research In Motion Limited	RIMM	36.23B	17.83	6.62	37.59	2.11
Texas Instruments Incorporated	TXN	25.80B	21.06	2.93	13.37	1.15
Thermo Fisher Scientific, Inc	TMO	15.96B	18.24	1.11	6.07	0.93
VMware, Inc.	VMW	10.20B	32.23	5.29	17.41	

These specifications filtered out several small and extremely volatile companies. The companies that passed the filters are large popular companies that experience a heavy amount of daily trading volume.

3.3 Parameters of Technical Analysis Measures

The standard parameters of most technical analysis measures can be altered to fit specific trading strategies. Typically, the method of trial and error is used to find parameters that work best with your trading style. This simulation deals with short-term trading because it only lasts for eight-weeks. Thus, shortened parameters are used to see averages and periods within a few days to two-weeks. Although this is useful for short-term trading, false trading signals occur more frequently. More than one technical analysis measure must be used when making a trading decision to prevent false trading signals from happening too often. Every trading signal that was used to justify an equity trade is labeled by a shape or a line in all the technical analysis charts provided in this report. The specific point of interest for RSI is indicated by a light blue circle, the SMA trend line is indicated by a pink line, and the MACD is indicated by a light green circle. The different colored arrows found on all the charts are present solely to quickly find the appropriate trading signal.

All of the default technical analysis parameters were changed except for the RSI. The SMA was set to a 5-day and 15-day moving average. This allows one to see a change in the price trend line more quickly. Parameters for the BB were set to a period of 10-days with a standard deviation SMA of 2-days. These parameters needed to change in order to be measuring volatility at the same rate as the SMA. RSI was kept at a 14-day period. Keeping the RSI at this

14-day period was better for this simulation because it caused far less false trading alarms. MACD parameters were set to 8-day and 17-day EMA (Exponential Moving Averages) and had a 5-day EMA trigger. Typically, the MACD parameters are 12-day and 26-day EMA and a 9-day EMA trigger. The values for MACD used in this simulation were determined by appropriately choosing the short EMA of 8-days and then using ratios to find the 17-day EMA and the 5-day EMA trigger. All of these chosen values are not documented values to solely be used when short trading. Each trader is different and the parameters are to be set to that person's specific trading habits. Because the simulation lasted for only eight-weeks and the fact that this was my first time using technical analysis, I made educated approximations for all of my parameters instead of using the trial and error method.

3.4 Determining Transaction Triggers

By the end of this eight-week simulation, a total of 80 transactions were made; 40 purchased and 40 sold. That is an average of 10 transactions each week. Each transaction, whether bought or sold, underwent technical analysis. A small margin of transactions were made with some supporting technical analysis measures coupled with other factors, whether they be news, expected growth, low price, etc. Majority of the transactions were bought or sold due to certain technical analysis measures.

Common technical analysis measures that indicate a good time to buy or sell are equal but opposite. For this simulation, majority of transactions were made using a method that I deemed suitable to determine whether a stock should be bought or sold. A stock was purchased when the RSI was rising and the MACD had almost or completely converged with the trigger

line. A rising stock price and a positive SMA trend line are typically associated with a stock purchase. Now a stock was sold when the opposite occurred; the RSI was falling and the MACD had almost or completely diverged with the trigger line. A falling stock price and a negative SMA trend line are usually associated with selling a stock.

An explanation of the technical analysis measures used when carrying out a transaction and further transaction details will be provided for each of the first ten investments and for each transaction that did not exactly follow the method explained above. For each transaction where no explanation is provided and no transaction details are included, it can be assumed that the technical analysis measures followed the method explained above. All transaction details are found in Table A-1 in the appendix. Charts will be provided for each transaction.

3.5 Breakdown of Initial Investments

An investment into a minimum of 10 companies, found in Table 3.1, was a requirement for the initial investment and organization of the technology portfolio. The 10 companies first selected for the technology portfolio were determined using basic technical analysis, subsector diversification, popularity of a company, price, beta diversification, and comparisons between all 20 companies. Technical analysis measures were weighted the most when making the final decision of whether to invest or not. Out of the original 20 companies that passed all filters, only two had poor buy signals resulting from technical analysis; First Solar Inc. and Hewlett Packard Company. The remaining companies had fair to very good buy signals. The initial technology portfolio was created on May 26, 2009, and the first 10 investments included the companies found in Table 3.2.

Company Name	Symbol	Subsector	Shares	Price	Cash Value	Beta
Apple Inc.	AAPL	Computer Hardware	1200	$124.76	$149,722.00	1.66
Google Inc.	GOOG	Computer Services	400	$391.95	$156,790.00	1.17
Intel Corporation	INTC	Semiconductors	5000	$15.01	$75,060.00	1.17
International Business Machines Corp.	IBM	Computer Hardware	700	$101.32	$70,934.00	0.79
Microsoft Corporation	MSFT	Software	5100	$19.54	$99,664.00	1.01
Oracle Corporation	ORCL	Software	4000	$18.46	$73,850.00	1.04
QUALCOMM, Inc.	QCOM	Communications Equipment	1800	$40.73	$73,324.00	0.99
Texas Instruments Incorporated	TXN	Semiconductors	5500	$18.35	$100,935.00	1.15
Thermo Fisher Scientific, Inc	TMO	Scientific & Technical Instr.	2700	$37.00	$99,910.00	0.93
VMware, Inc.	VMW	Software	3500	$28.42	$99,480.00	
				Investment Total	$999,669.00	

Since the initial technical analysis was performed prior to the simulation start date, all of the 10 initial companies were bought at the opening price value for May 26, 2009. Out of the $1M balance, a total of $999,669.00, including a $10 transaction fee for each stock bought, was invested into the 10 companies found in Table 3.2. The initial technology portfolio consisted of a diverse selection of companies from different subsectors and with a variety of beta ratios. The amount invested into a company was determined from current and/or potential strength from technical analysis and the familiarity of the company.

Apple Inc., Google Inc., Intel Corporation, International Business Machines Corp., and Microsoft Corporation are very well known heavily traded companies that I felt comfortable adding first to the portfolio. However, their popularity was not the only consideration taken when adding them to the portfolio. They all had strong buy signals from their technical analysis. All five of these companies had steep increases in their RSI within a few days before May 26, 2009; see Figures 3.1 to 3.5. They also all had MACD lines that appeared to be converging

within one to two days; see Figures 3.1 to 3.5. When the MACD line is about to converge or has just converged, a buy signal is indicated when coupled with another form of technical analysis measure. The SMA trend line, 5-day SMA, and 10-day SMA, for all but INTC, had increased from the last dip or trough in the daily prices; see Figures 3.1 to 3.5. INTC's SMA trend line appeared to be steadily increasing at a much slower rate and appeared to be more volatile in comparison to the other four companies. All prices for each of the five companies on and before May 26, 2009 were below their 10-day moving average and were near the bottom BB; indicating the stock is oversold; see Figures 3.1 to 3.5. These five companies all had very good buy signals, from the RSI and MACD, and all but INTC had good supporting overlays from the SMA trend line and BB.

Figure 3.1: AAPL - May 26, 2009   Figure 3.2: GOOG - May 26, 2009

Figure 3.3: INTC - May 26, 2009

Figure 3.4: IBM - May 26, 2009

Figure 3.5: MSFT - May 26, 2009

The remaining five companies, Oracle Corporation, Qualcomm, Inc., Texas Instruments Incorporated, Thermo Fisher Scientific Inc., and VMware Inc., all had very good technical analysis data. All five companies had a buy trigger that ranged from five days prior to the exact initial purchase date of May 26, 2009. Typically when the initial buy trigger is missed, a higher price is paid for the stock. However, all the technical measures continued to support positive growth in each of the stocks where the initial buy trigger was missed. Each of the last five companies had a positive SMA trend line starting from 10 trading days prior to the simulation start date; see Figures 3.6 to 3.10. Also, they each had a positive 5-day SMA prior to May 26, 2009; see Figures 3.6 to 3.10.

ORCL had a MACD convergence and a rising RSI on May 18, 2009; see Figure 3.6. This was a buy trigger. The RSI dipped negatively on May 21, 2009, and the MACD dipped but did not diverge; see Figure 3.6. Luckily, the RSI began to rise again on May 22, 2009 which was the trading day before the simulation began; see Figure 3.6. If I was able to purchase ORCL on May 18, 2009 when the buy trigger indicated, I would have paid $18.92 per share. However, on May 26, 2009 the price had dropped to $18.46 with the technical measures still producing positive growth data.

QCOM could not have been bought at a more perfect time. Out of all the twenty companies that passed through all filters, QCOM was the only one that had an exact buy trigger on May 26, 2009. MACD converged at the end of day closing price on May 22, 2009; see Figure 3.7. The RSI rose dramatically from end of day on May 22, 2009 to May 26, 2009; see Figure 3.7.

Figure 3.6: ORCL - May 26, 2009

Figure 3.7: QCOM - May 26, 2009

TXN had an increasing RSI since May 12, 2009 and a MACD convergence on May 18, 2009; see Figure 3.8. The missed buy trigger for this stock was on May 18, 2009. Since that date, the RSI, the MACD, and the stock price had increased, meaning this stock was very strong at the initial purchase date of May 26, 2009; see Figure 3.8. On May 18, 2009, the end of day price was $17.90, and on May 26, 2009 the opening day purchase price was $18.35. Thus, the stock was purchased at a price that was $0.45 more than the date of the buy trigger.

TMO had a buy signal the trading day before the simulation began. TMO was a very strong purchase. At end of day on May 22, 2009, RSI was increasing and MACD had already converged; see Figure 3.9. On May 26, 2009, RSI continued to increase at the same steep pace and MACD rose sharply; see Figure 3.9. The closing price for May 22, 2009 was $36.26, and the opening price for May 26, 2009 was $37.00; a difference of $0.74.

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Figure 3.8: TXN - May 26, 2009   Figure 3.9: TMO - May 26, 2009

VMW has no beta ratio listed on the Google® finance website.   However, upon examination of the month prior to the simulation start date of May 26, 2009, one can see the company was very volatile by noticing the large width between upper and lower BB; see Figure 3.10. During the six-day trading week from May 18, 2009 thru May 26, 2009, the width between upper and lower BB dramatically decreased; see Figure 3.10. The ideal buy date for this stock would have been May 19, 2009. On that date the RSI had been increasing and the MACD had just converged; see Figure 3.10. On May 21, 2009, RSI, MACD, and stock price dipped slightly but not enough to cause alarm; see Figure 3.10. By May 26, 2009, RSI, MACD, and price were back on a steady rise; see Figure 3.10.

Figure 3.10: VMW - May 26, 2009

4. Company Profiles

Adobe Systems, Inc. (ADBE)

Public, NASDAQ

Technology: Software

Adobe Systems Incorporated (Adobe), incorporated in October 1983, is a diversified software companies. The Company offers a line of creative, business and mobile software and services used by creative professionals, knowledge workers, consumers, original equipment manufacturer (OEM) partners, developers and enterprises for creating, managing, delivering and engaging with content and experiences across multiple operating systems, devices and media. It distributes its products through a network of distributors, value-added resellers (VARs), systems integrators, independent software vendors (ISVs) and OEMs, direct to end users and through its own Website at www.adobe.com. It also licenses its technology to hardware manufacturers, software developers and service providers, and offer integrated software solutions to businesses of all sizes. Adobe has operations in the Americas, Europe, Middle East and Africa (EMEA) and Asia. Its software runs on personal computers (PC) with Microsoft Windows, Apple Mac OS, Linux, UNIX and various non-PC platforms, depending on the product. In September 2008, it acquired YaWah ApS, a dynamic imaging software provider based in Denmark [4].

Apple Inc. (AAPL)

Public, NASDAQ

Technology: Computer Hardware

Apple Inc., incorporated on January 3, 1977, designs, manufactures, and markets personal computers, portable digital music players, and mobile communication devices and sells a variety

of related software, services, peripherals, and networking solutions. The Company sells its products worldwide through its online stores, its retail stores, its direct sales force, and third-party wholesalers, resellers, and value-added resellers. In addition, the Company sells a variety of third-party Macintosh (Mac), iPod and iPhone compatible products, including application software, printers, storage devices, speakers, headphones, and various other accessories and peripherals through its online and retail stores, , and digital content through the iTunes Store. It sells to consumer, small and mid-sized business (SMB), education, enterprise, government, and creative customers [4].

Cisco Systems, Inc. (CSCO)

NASDAQ

Technology: Computer Peripherals

Cisco Systems, Inc., incorporated in December 1984, designs, manufactures and sells Internet protocol (IP)-based networking and other products related to the communications and information technology (IT) industry, and provides services associated with these products and their use. The Company provides a line of products for transporting data, voice, and video within buildings, across campuses, and around the world. Its products are designed to transform how people connect, communicate and collaborate. Cisco Systems, Inc.'s products, which include primarily routers, switches, and products that the Company refers to as its technologies, are installed at enterprises, public institutions, telecommunications companies, commercial businesses and personal residences. Cisco Systems, Inc. conducts its business globally and is managed geographically in five segments: the United States and Canada, European Markets, Emerging Markets, Asia Pacific and Japan. The Emerging Markets theater consists of Eastern

Europe, Latin America, the Middle East and Africa, and Russia and the Commonwealth of Independent States (CIS).

In September 2008, Cisco Systems, Inc. completed its purchase of PostPath, Inc., a provider of e-mail and calendaring software. In November 2008, the Company acquired Jabber Inc., a provider of presence and messaging software. In January 2009, the Company acquired Richards-Zeta Building Intelligence, Inc. In May 2009, the Company purchased Tidal Software, Inc. In May 2009, the Company also purchased Pure Digital Technologies Inc.

The Company's product offerings fall into three categories: its core technologies, routing and switching; technologies, and other products. In addition to its product offerings, the Company provides a range of service offerings, including technical support services and advanced services. Cisco Systems, Inc.'s customer base spans all types of public and private agencies and businesses, comprising enterprise companies, service providers, commercial customers and consumers [4].

Danaher Corporation (DHR)

NYSE

Technology: Scientific and Technical

Danaher Corporation (Danaher) is engaged in designing, manufacturing and marketing of professional, medical, industrial, commercial and consumer products. The Company operates in four business segments: professional instrumentation, medical technologies, industrial technologies, and tools and components [4].

Dell Inc. (DELL)

Public, NASDAQ

Technology: Computer Hardware

Dell Inc. (Dell) is a technology company that designs, develops, manufactures, markets, sells, and supports a range of products. Its product categories include mobility products, desktop personal computers (PCs), software and peripherals, servers and networking, services, and storage. The Company manages its business in four operating segments: Americas Commercial; Europe, Middle East and Africa (EMEA) Commercial; Asia Pacific-Japan (APJ) Commercial, and Global Consumer. During the fiscal year ended January 30, 2009 (fiscal 2009), the Company acquired the Networked Storage Company. In April 2008, the Company completed the acquisition of MessageOne, Inc., a company engaged in providing software-as-a-service (SaaS)-enabled, enterprise-class, e-mail business continuity, compliance, archiving and disaster recovery services. In January 2009, the Company acquired the Microsoft IT consulting and solutions segments of Allin Corporation [4].

EMC Corporation (EMC)

Public, NYSE

Technology: Computer Hardware

EMC Corporation (EMC), incorporated in 1979, develops, delivers and supports the information technology (IT) industry's range of information infrastructure technologies and solutions. EMC's Information Infrastructure business provides a foundation for customers to manage and secure their information, automate their data center operations. EMC's VMware Virtual Infrastructure business, which is represented by a majority interest in VMware, Inc., is the provider of virtual

infrastructure software solutions from the desktop to the data center. VMware's virtual infrastructure software solutions run on industry-standard desktops and servers and support a range of operating system and application environments, as well as networking and storage infrastructures. EMC's Information Infrastructure business comprises three segments: Information Storage, Content Management and Archiving, and RSA Information Security. During the year ended December 31, 2008, the Company acquired Pi Corporation, Document Sciences Corporation, Infra Corporation Pty Limited, WysDM Software Inc., Conchango plc. and Iomega Corporation [4].

First Solar, Inc. (FSLR)

Public, NASDAQ

Technology: Semiconductors

First Solar, Inc., incorporated on February 22, 2006, designs and manufactures solar modules using a thin film semiconductor technology. The Company's solar modules employ a thin layer of cadmium telluride semiconductor material to convert sunlight into electricity. Each solar module is approximately 2 feet by 4 feet (60 centimeters by 120 centimeters) and had an average rated power of approximately 73 watts, during the fiscal year ended December 27, 2008. Its solar module is a single-junction polycrystalline thin film structure that uses cadmium telluride as the absorption layer and cadmium sulfide as the window layer. The Company's solar power systems and project development business provides a variety of integrated services to its customers as part of a system solution delivery. These services include solar power system design, procurement of permits and balance of system components, construction management, monitoring and maintenance.

The Company has long-term solar module supply contracts (the Long Term Supply Contracts) with one United States and 15 European project developers, system integrators and operators. The Company's customers develop, own and operate solar power plants or sell turnkey solar power plants to end users that include owners of land, owners of agricultural buildings, owners of commercial warehouses, offices and industrial buildings, public agencies, municipal government authorities, utility companies and financial investors that desire to own large scale solar power plant projects [4].

Google Inc. (GOOG)

Public, NASDAQ

Technology: Computer Services

Google Inc., incorporated in September 1998, maintains an index of Websites and other online content, and makes this information freely available through its search engine to anyone with an Internet connection. The Company's automated search technology helps people obtain nearly instant access to relevant information from its online index. The Company generates revenue primarily by delivering online advertising. Businesses use its AdWords program to promote their products and services with targeted advertising. In addition, the thousands of third-party Websites that comprise the Google Network use its AdSense program to deliver relevant ads that generate revenue and enhance the user experience. In March 2008, the Company acquired Click Holding Corp. (DoubleClick), a company that offers online ad serving and management services to advertisers, ad agencies and Web site publishers. In August 2008, the Company sold the search marketing business of Performics, a division of DoubleClick. In September 2008, Google Inc. bought Korea-based blogging software developer Tatter and Company [4].

Hewlett-Packard Company (HPQ)

Public, NYSE

Technology: Computer Hardware

Hewlett-Packard Company (HP), incorporated in 1947, is a provider of products, technologies, software, solutions and services to individual consumers, small- and medium-sized businesses (SMBs) and large enterprises, including the public and education sectors. The Company's offerings span personal computing and other access devices; imaging and printing-related products and services; enterprise information technology infrastructure, including enterprise storage and server technology and software that optimizes business technology investments, and multi-vendor customer services, including technology support and maintenance, consulting and integration and outsourcing services, as well as application services and business process outsourcing. During the fiscal year ended October 31, 2008 (fiscal 2008), HP's operations were organized into seven business segments: Enterprise Storage and Servers (ESS), HP Services (HPS), HP Software, the Personal Systems Group (PSG), the Imaging and Printing Group (IPG), HP Financial Services (HPFS) and Corporate Investments [4].

Intel Corporation (INTC)

Public, NASDAQ

Technology: Semiconductors

Intel Corporation, incorporated in 1968, is a semiconductor chip maker. The Company is engaged in developing advanced integrated digital technology products, primarily integrated circuits, for industries, such as computing and communications. Its primary component-level products include microprocessors, chipsets, motherboards, wired and wireless connectivity. The Company offers products at various levels of integration, allowing its customers the capability to

create computing and communications systems. As of December 27, 2008, the Company was mainly organized in two segments: Digital Enterprise Group (DEG) and Mobility Group (MG). In July 2008, Impinj, Inc. announced the acquisition of Intel Corporation's radio frequency identification (RFID) operation, a business created by the Company's new business initiatives (NBI) incubator, and which developed the R1000 RFID reader chip. During the fiscal year ended December 27, 2008 (fiscal 2008), the Company completed the divestiture of its NOR flash memory business [4].

International Business Machines Corp. (IBM)

Public, NYSE

Technology: Computer Services

International Business Machines Corporation (IBM), incorporated on June 16, 1911, is an information technology (IT) company. The Company's major operations include Global Technology Services segment (GTS), Global Business Services segment (GBS), Software segment, Systems and Technology segment, and Global Financing segment. On January 31, 2008, the Company acquired 100% of Cognos, Inc. On April 3, 2008, IBM acquired 100% of Telelogic, AB. In July 2008, the Company acquired Platform Solutions, Inc. (PSI). In December 2008, its internal global logistics operations were acquired by SNCF Transport and logistics division of Geodis [4].

Juniper Networks, Inc. (JNPR)

Public, NASDAQ

Technology: Communications Equipment

Juniper Networks, Inc., incorporated in 1996, designs, develops and sells products and services that together provide its customers with network infrastructure that creates responsive and trusted environments for accelerating the deployment of services and applications over a single Internet Protocol (IP)-based network. The Company serves the networking requirements of global service providers, enterprises, governments and research and education institutions. The Company's operations are organized into two business segments: Infrastructure and Service Layer Technologies (SLT). Its Infrastructure segment primarily offers scalable routing products that are used to control and direct network traffic from the core, through the edge, aggregation and the customer premise equipment level. Its SLT segment offers solutions that meet an array of its customer's priorities, from protecting the network itself, and protecting data on the network, to maximizing existing bandwidth and acceleration of applications across a distributed network [4].

Microsoft Corporation (MSFT)

Public, NASDAQ

Technology: Software

Microsoft Corporation develops, manufactures, licenses and supports a range of software products for computing devices. The Company's software products include operating systems for servers, personal computers (PCs) and intelligent devices, server applications for distributed computing environments, information worker productivity applications, business solution applications, high-performance computing applications and software development tools and

video games. It provides consulting and product support services, and trains and certifies computer system integrators and developers. Microsoft Corporation sells the Xbox 360 video game console and games, the Zune digital music and entertainment device, PC games, and peripherals. Online offerings and information are delivered through its Live Search, Windows Live, Office Live, and MSN portals and channels. The Company enables the delivery of online advertising through its adCenter platform. The Company has five segments: Client, Server and Tools, the Online Services Business, the Microsoft Business Division, and the Entertainment and Devices Division.

On August 10, 2007, the Company acquired aQuantive, Inc. On April 24, 2008, it acquired Fast Search & Transfer ASA (FAST). In April 2008, it acquired Danger, Inc. (Danger). In June 2008, the Company announced the acquisition of Navic Networks, a provider of television advertising solutions. Navic will join Microsoft's Advertiser and Publisher Solutions (APS) Group. In September 2008, the Company closed the acquisition of DATAllegro Inc [4].

Oracle Corporation (ORCL)

NASDAQ

Technology: Software

Oracle Corporation (Oracle), incorporated in 2005, is an enterprise software company. The Company develops, manufactures, markets, distributes and services database and middleware software, as well as applications software that help organizations to manage their businesses. Oracle is organized into two businesses: software and services. These businesses are further divided into five operating segments. Its software business consists of two operating segments,

new software licenses, and software license updates and product support. Its services business consists of three operating segments, consulting, On Demand and education. The Company's software business represented 80% of its total revenues and its services business represented 2o% of total revenues during the fiscal year ended May 31, 2008 (fiscal 2008).

In June 2008, the Company announced the formation of a Global Business Unit focused on software applications for the health sciences industry. The Oracle Health Sciences Global Business Unit will help health sciences organizations discover, develop and market products and services to prevent and cure diseases. On April 29, 2008, the Company completed the acquisition of BEA Systems, Inc. In September 2007, the Company acquired Bridgestream, Inc., a provider of enterprise role management software. In December 2007, the Company announced that it acquired Moniforce, a software vendor for monitoring the availability and performance of any Web application [4].

Qualcomm Incorporated (QCOM)

NASDAQ

Technology: Communications Equipment

QUALCOMM Incorporated, incorporated in 1985, designs, manufactures and markets digital wireless telecommunications products and services based on its code division multiple access (CDMA) technology and other technologies. The Company operates through four segments: Qualcomm CDMA Technologies (QCT); Qualcomm Technology Licensing (QTL); Qualcomm Wireless & Internet (QWI), and Qualcomm Strategic Initiatives (QSI). QCT is a developer and supplier of integrated circuits and system software for wireless voice and data communications,

multimedia functions and global positioning. QTL grants licenses to use portions of its intellectual property portfolio, which includes certain patent rights essential to and/or useful in the manufacture and sale of CDMA products. QWI generates revenue primarily through mobile communication products and services, software and software development. QSI makes investments to promote the worldwide adoption of CDMA products and services. In December 2007, the Company acquired San SoftMax Inc. In March 2008, the Company acquired Xiam Technologies Limited (Xiam), an Ireland-based provider of wireless content targeting solutions [4].

Research In Motion Limited (RIMM)

Public, NASDAQ

Technology: Communications Equipment

Research In Motion Limited (RIM), incorporated on March 7, 1984, is a designer, manufacturer and marketer of wireless solutions for the worldwide mobile communications market. Through the development of integrated hardware, software and services that support multiple wireless network standards, RIM provides platforms and solutions for access to information, including e-mail, phone, short message service (SMS), Internet and intranet-based applications. RIM's portfolio of products, services and embedded technologies are used by organizations worldwide and include the BlackBerry wireless solution, the RIM Wireless Handheld product line, software development tools and software. RIM operates offices in North America, Europe and Asia Pacific. During the fiscal year ended February 28, 2009 (fiscal 2009), the Company launched a number of new devices, including the BlackBerry Bold 9000, BlackBerry Storm 9500 and 9530,

BlackBerry Pearl Flip 8220 and 8230, and the BlackBerry Curve 8350i and 8900. In January 2009, the Company completed the acquisition of Chalk Media Corp. In March 2009, RIM completed the acquisition of Certicom Corp [4].

Texas Instruments Incorporated (TXN)

Public, NYSE

Technology: Semiconductors

Texas Instruments Incorporated (TI) is engaged in designing and producing semiconductors that it sells to electronics designers and manufacturers. The Company is organized in four segments: Analog, Embedded Processing, Wireless and Other. TI sells two general categories of semiconductor products: custom and standard. A custom product is designed for a specific customer for a specific application, is sold only to that customer and is typically sold directly to the customer. A standard product is designed for use by many customers and/or many applications and is generally sold through both distribution and direct channels. In May 2008, the Company acquired Commergy Technologies, Ltd., an Ireland-based power supply reference design provider that specializes in energy efficient and compact architectures. In June 2008, the Company acquired Innovative Design Solutions (IDS), which develops analog chips and integrated solutions. In May 2009, the Company announced that it will expand its microcontroller (MCU) portfolio with the acquisition of Luminary Micro, the supplier of ARM Cortex-M3-based 32-bit MCUs [4].

Thermo Fisher Scientific, Inc. (TMO)

Public, NYSE

Technology: Scientific and Technical

Thermo Fisher Scientific Inc. (Thermo Fisher), incorporated in 1956, is engaged in serving science. It provides analytical instruments, equipment, reagents and consumables, software and services for research, manufacturing, analysis, discovery and diagnostics. The Company operates through two segments: analytical technologies and laboratory products and services. Analytical technologies segment includes pharmaceutical, biotechnology, academic, government and other research and industrial markets. Laboratory products and services segment offers combination of products and services that allows its customers to engage in their core business functions of research, development, manufacturing, clinical diagnosis and drug discovery. During 2008, the Analytical Technologies segment acquired the intellectual property of an immunohistochemistry control slide business a manufacturer and distributor of analytical instruments serving the life sciences and environmental industries. In April 2009, Alesco Corporation Ltd. sold its Scientific & Medical division to Thermo Fisher Scientific Inc.

The Company operates through two brands: Thermo Scientific and Fisher Scientific. Thermo Scientific offers a range of high-end analytical instruments, as well as laboratory equipment, software, services, consumables and reagents to enable integrated laboratory workflow solutions. Its portfolio of products includes technologies for mass spectrometry, elemental analysis, molecular spectroscopy, sample preparation, informatics, fine- and high-purity chemistry production, cell culture, protein analysis, ribonucleic acid (RNA) -interference techniques, immunodiagnostic testing, microbiology, as well as environmental monitoring and process control. Fisher Scientific provides portfolio of laboratory equipment, chemicals, supplies and

services used in healthcare, scientific research, safety and education markets. It is offered through a network of direct sales professionals, industry-specific catalogs, e-commerce capabilities and supply-chain management services. It also offers a range of biopharma services for clinical trials management, biospecimen storage and analytical testing [4].

VMware, Inc. (VMW)

Public, NYSE

Technology: Software

VMware, Inc., incorporated in 1998, is a provider of virtualization solutions from the desktop to the data center. The Company's suite of virtualization solutions addresses a range of information technology (IT) problems that include cost and operational inefficiencies, business continuity, software lifecycle management and desktop management. It works closely with over 900 technology partners, including server, microprocessor, storage, networking and software vendors. In July 2008, the Company completed the acquisition of B-hive Networks, a privately held application performance management software company with headquarters in San Mateo, California, and principal research and development facilities in Herzliya, Israel. In November 2008, VMware, Inc. bought Trango Virtual Processors, which specializes in virtualization software for mobile phones, which allows a single phone to run multiple operating systems [4].

5. Active Management of Portfolio: Weeks 1-4

5.1 Overall Summary of Weeks 1-4

Majority of the initial investments were sold during the fourth week of the simulation. All of the first 10 investments were held onto for the first two trading weeks. Three of those 10 companies were sold during the third week. Five companies were sold during the fourth week. Only one stock was bought during the fourth week and that became the portfolio's largest loss percentage. The remaining two companies, Apple Inc. and Texas Instruments Inc., were sold on the first day of the fifth week.

5.2 Week 1: May 26, 2009 – May 29, 2009

To begin the simulation, 10 companies were chosen from a filtered pool of 20 technology companies. They were chosen based on different technical analysis measures and other factors. All of the details explaining the breakdown of these initial investments were previously explained in Chapter 3.5, *Breakdown of Initial Investments*. It was explained in Chapter 1.1, Introduction*,* which initial investments were not going to be traded for at least one to two weeks unless their stock price dropped more than five percent of the opening day price. None of the initial 10 companies were sold during the first week. All of them had strong technical data that supported the reasons why they were initially bought.

5.3 Week 2: June 1, 2009 – June 5, 2009

During the second week of the simulation, all the original investments as well as the remaining 10 companies were monitored in terms of growth, current news, and technical analysis.   Every one of the 10 original investments made strong gains as the simulation progressed.   No transactions were made during this week because the technical analysis data for each company continued to be strong and positive.

5.4 Week 3: June 8, 2009 – June 12, 2009

On the second day of the third week, the first transaction took place since May 26, 2009. There were nine transactions made during this week. All of the details of these transactions are found in Table 5.1 below. The three stocks sold, GOOG, AAPL, and VMW, each had a very large gain percentage; all above 10 percent. These three companies contributed to 18.5 percent of all portfolio profits. MSFT was making huge gains every day since the beginning of the simulation. For that reason, MSFT was bought twice more this week. Most of the technical analysis data for the 10 original investments were declining by the end of the week. By week end, a total of $888.00 in cash was available.

Table 5.1: Week 3 Transaction Details

SYMBOL	Buy or Sell	Date	Amt. of Shares	Purchase Price Per Share	Total Cost	Closing Quote	Gain/Loss ($)	Gain/Loss (%)
GOOG	Sell	6/9/2009	400	$391.95	$156,800.00	$435.62	$17,448.00	11.13%
DELL	Buy	6/9/2009	8000	$12.60	$100,820.00	N.A.	N.A.	N.A.
MSFT	Buy	6/9/2009	3300	$22.08	$72,884.00	N.A.	N.A.	N.A.
AAPL	Sell	6/10/2009	1200	$124.76	$149,732.00	$140.25	$18,568.00	12.40%
EMC	Buy	6/10/2009	7700	$12.88	$99,196.00	N.A.	N.A.	N.A.
HPQ	Buy	6/10/2009	1900	$36.79	$69,921.00	N.A.	N.A.	N.A.
VMW	Sell	6/11/2009	3500	$28.42	$99,490.00	$32.13	$12,965.00	13.03%
HPQ	Buy	6/11/2009	2200	$37.23	$81,926.00	N.A.	N.A.	N.A.
MSFT	Buy	6/11/2009	1300	$22.83	$29,699.00	N.A.	N.A.	N.A.

GOOG was the first stock sold out of the 10 original stock investments. GOOG shares were sold due to the RSI rising well above 70 for about a week and then suddenly dropping; see Figure 5.1. This is a major technical indicator that the stock price will drop dramatically because the stock was overbought. The price dropped for the second straight trading day and the MACD line was about to diverge.

DELL was purchased for the first time after the sale of all GOOG shares. The technical data for DELL did not indicate a perfect buy signal. The buy trigger took place a few days prior and the technical data continued to show a positive trend; see Figure 5.2.

Figure 5.1: GOOG – May 26, 2009 (buy) - June 9, 2009 (sell)   **Figure 5.2: DELL - June 9, 2009 (buy) – June 15, 2009 (sell)**

MSFT shares were additionally purchased. MSFT was gaining incredible strength daily and only strong supporting news about the company appeared on the Google® finance website. Similarly to DELL, MSFT was bought after the buy signal; see Figure 5.3.

AAPL was sold because the RSI began to fall rapidly from an overbought level (above 70), the price began to drop, the 5-day SMA seemed to have peaked, and the MACD trigger line just diverged; see Figure 5.4.

EMC shares were not purchased with very strong technical data backing it up. RSI was fairly flat lined around 60 (approaching overbought), 5-day SMA had a plateau two days prior, and the MACD line was no longer rising at a steep pace; see Figure 5.5. The only positive data found was that the price was rising steadily and the 15-day SMA was continuing to rise steadily; see Figure 5.5. This stock was bought because the technical data was stronger than the rest of the available stocks.
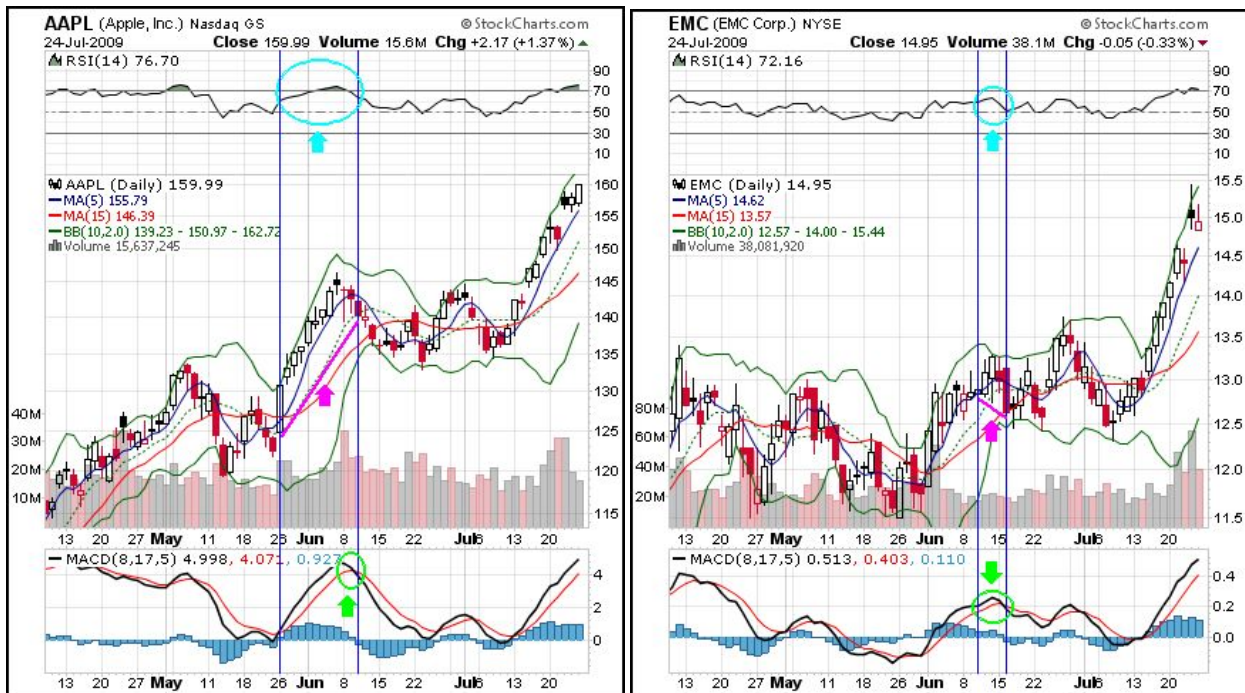
Figure 5.4: AAPL - May 26, 2009 (buy) - June 10, 2009 (sell)   Figure 5.5: EMC - June 10, 2009 (buy) - June 16, 2009 (sell)

HPQ, as with the EMC purchase, did not have strong technical data backing up this purchase. The RSI was flat lined, the volatility of the stock was fairly high (refer to BB width), and the 5-day SMA and the MACD line were not increasing as steeply as before, but the price continued to increase as well as the 15-day SMA; see Figure 5.6. This stock was purchased because I did not initially realize that the technical data was weakening due to a lack of experience in technical analysis.

Figure 5.6: HPQ - June 10, 2009 (buy) - June 11, 2009 (buy) - June 22, 2009 (sell)

VMW was sold for the highest gain, 13.03 percent, during the third week; see Table 5.1.
Before the sell date, the RSI had been having a negative trend line for days, and the MACD line
continued to gradually head toward divergence; see Figure 5.7. All the shares were not sold
earlier because the stock price continued to rise significantly. I was taking a chance that the
stock price would continue to rise as long as the RSI did not freefall and the MACD did not
diverge.
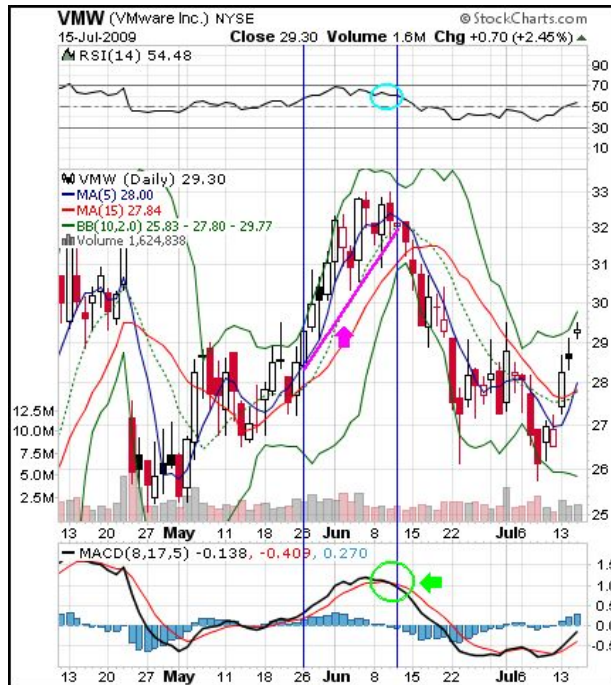
Figure 5.7: VMW - May 26, 2009 (buy) - June 11, 2009 (sell)

HPQ was again purchased one day after the initial buy. The technical data had not noticeably changed since the day prior; see Figure 5.6.

MSFT stock was additionally purchased for the third time. A smaller amount was invested this time because there was $172,558.00 worth of MSFT shares previously bought. I did not want to invest much more than 20 percent of the starting balance in one company. MSFT continued to make strong gains in all technical data. It is important to note that although the RSI was above 70 (an overbought signal) it continued to steadily rise; see Figure 5.3.

5.5 Week 4: June 15, 2009 – June 19, 2009

The overall market was fairly poor this week. Table 5.2 shows 7/8 of the transactions to be the selling of stock. During the fourth week of the simulation, all but two of the initial investments were active. The percent gains this week were not as high as the ones in the week prior. This week also recorded the first investment to bring in a negative return. Total available balance by the end of week four was $524,808.00.

Table 5.2: Week 4 Transaction Details

SYMBOL	Buy or Sell	Date	Amt. of Shares	Purchase Price Per Share	Total Cost	Closing Quote	Gain/Loss ($)	Gain/Loss (%)
DELL	Sell	6/15/2009	8000	$12.60	$100,820.00	$12.87	$2,140.00	2.12%
INTC	Sell	6/15/2009	5000	$15.01	$75,070.00	$15.98	$4,830.00	6.43%
IBM	Sell	6/15/2009	700	$101.32	$70,944.00	$107.62	$4,390.00	6.19%
ORCL	Sell	6/15/2009	4000	$18.46	$73,860.00	$20.22	$7,020.00	9.50%
QCOM	Sell	6/15/2009	1800	$40.73	$73,334.00	$44.31	$6,424.00	8.76%
TMO	Sell	6/15/2009	2700	$37.00	$99,920.00	$40.42	$9,214.00	9.22%
EMC	Sell	6/16/2009	7700	$12.88	$99,196.00	$12.62	-$2,022.00	-2.04%
QCOM	Buy	6/19/2009	2200	$46.00	$101,220.00	N.A.	N.A.	N.A.

DELL shares were sold on June 15, 2009. The technical data analyzed from the charts suggested that the stock was becoming weak very quickly. The RSI peaked just above 70 the previous trading day on June 12, 2009; see Figure 5.2. By end of day June 15, 2009, the RSI dropped sharply to around 60; see Figure 5.2. MACD line also dropped quickly approaching divergence; see Figure 5.2. These shares were sold a little earlier than normal due to an abundance of failing stocks that day. DELL had the lowest gains on that date of 2.12 percent.

INTC had technical data that supported the selling of all of its shares; see Figure 5.8. MACD fully diverged past the trigger line by end of day June 15, 2009; see Figure 5.8. INTC was sold after the stock price per share dropped for four days straight.

IBM was also sold because the technical data analyzed supported this type of transaction; see Figure 5.9.
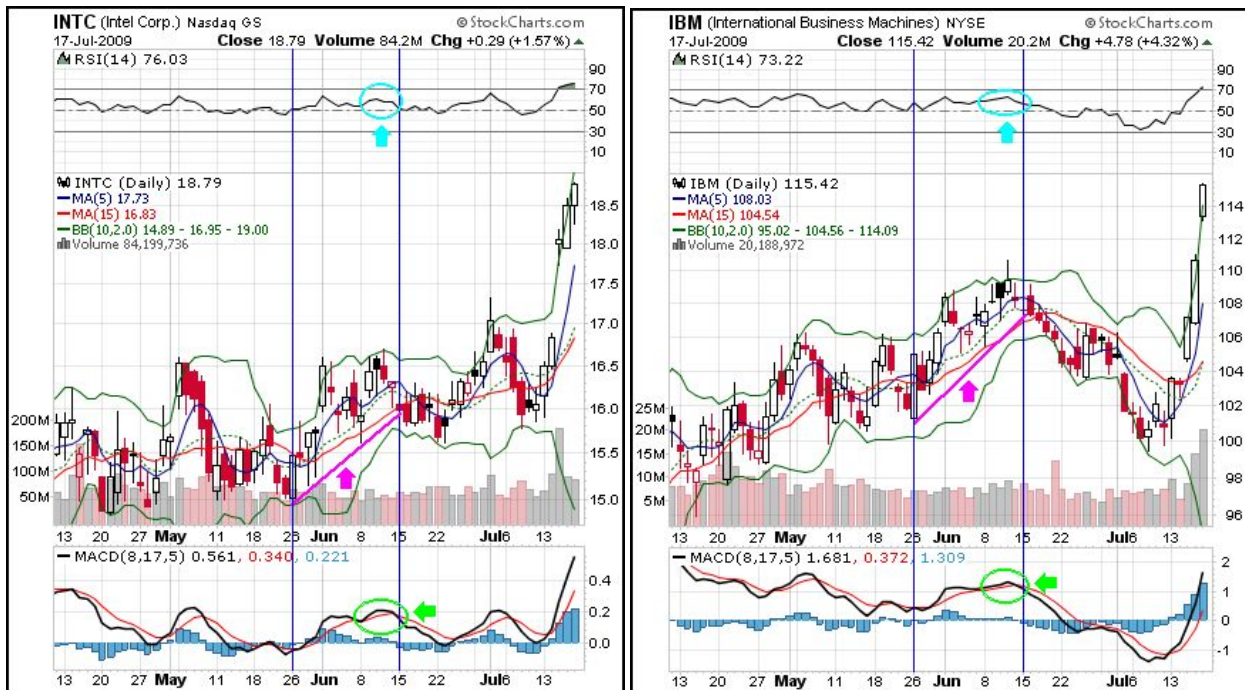
Figure 5.8: INTC - May 26, 2009 (buy) - June 15, 2009 (sell)   Figure 5.9: IBM - May 26, 2009 (buy) - June 15, 2009 (sell)

ORCL had been rising very steeply and rapidly over the course of the first three weeks. From one trading day prior to the sell date of June 15, 2009, the RSI plummeted from slightly above 70 to about 50, the 5-day SMA and the stock price dropped quickly, and the MACD diverged past the trigger line all in the matter of one trading day: see Figure 5.10. However, ORCL had the largest gains of the week with 9.50 percent.

QCOM had the same directional movement of technical measures as the sale of ORCL on June 15, 2009; see Figure 5.11.
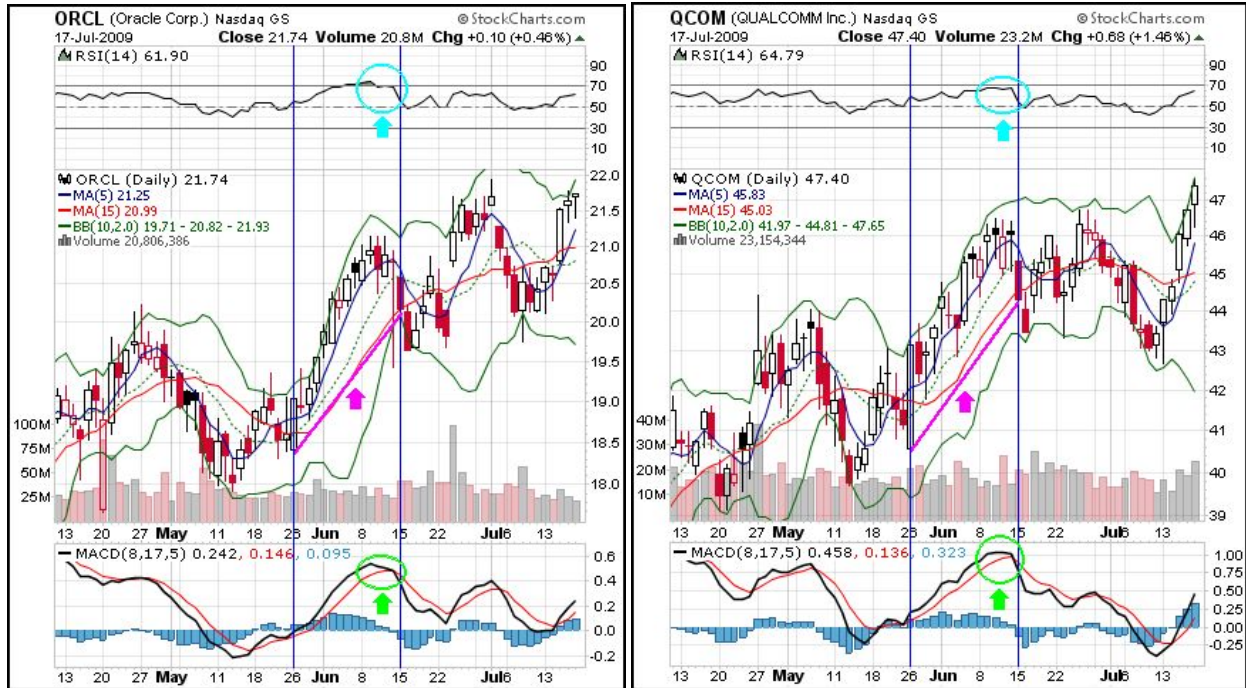
Figure 5.10: ORCL - May 26, 2009 (buy) - June 15, 2009 (sell)   Figure 5.11: QCOM - May 26, 2009 (buy) - June 15, 2009 (sell)

TMO also had the same technical data movements as ORCL and QCOM when sold on June 15, 2009. The technical measures dropped all within one day; see Figure 5.12. TMO had the second highest percentage gain of 9.22 percent.

Figure 5.12: TMO - May 26, 2009 (buy) - June 15, 2009 (sell)

EMC suffered the first loss in this simulation of -2.04 percent on June 16, 2009; see Table 5.2. There was great risk when purchasing this stock well after the initial buy trigger; see Figure 5.5. At the time of purchase, I did not realize that the original technical data suggested that the stock was weakening.

QCOM was purchased for a second time four days after it was sold. The technical analysis data seemed to be recovering. This was a unified buy trigger, except that the MACD had not fully converged; see Figure 5.13.
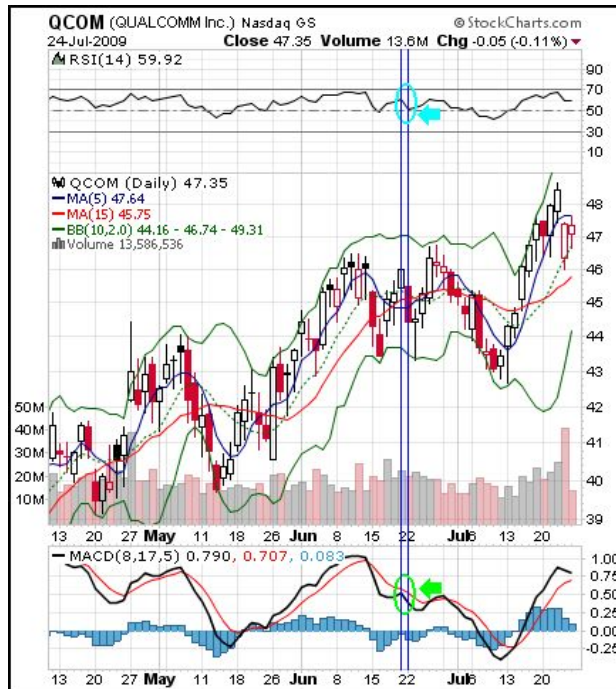
Figure 5.13: QCOM - June 19, 2009 (buy) - June 22, 2009 (sell)

6. Active Management of Portfolio: Weeks 5-8

6.1 Overall Summary of Weeks 5-8

After the first day of week five, none of the original 10 investments were active. The fifth week was fairly even with the types of transactions made; 10-buys and 7-sells. However, the sixth week had poor technical data all around. There were eight transactions made that week and all of them were the selling of shares. This left a large balance in available cash by the end of week six. Week seven was comprised of eight buys to two sells. By week end on July 10, 2009, all of the available cash balance was spent save approximately $200,000. Only one stock, GOOG, was sold after finding negative data during the final eighth week. After that sell, two companies were purchased during the last week. The remaining 12 technology investments were sold only because the end of simulation date, June 20, 2009, was reached.

6.2 Week 5: June 22, 2009 – June 26, 2009

Referring to Table 6.1 below, the fifth week proved to be the most active with 17 total transactions made; 7-sold and 10-bought. This week also provided the largest percentage gain and loss in the technology portfolio. Also, during this week, there was a period where there were no active stocks in the portfolio. However, by week end, all possible available cash was used and there was a remaining balance of $3,349.00.

SYMBOL	Buy or Sell	Date	Amt. of Shares	Purchase Price Per Share	Total Cost	Closing Quote	Gain/Loss ($)	Gain/Loss (%)
HPQ	Sell	6/22/2009	1900	$36.79	$69,921.00	$37.74	$1,785.00	2.55%
HPQ	Sell	6/22/2009	2200	$37.23	$81,926.00	$37.74	$1,102.00	1.35%
MSFT	Sell	6/22/2009	5100	$19.54	$99,674.00	$23.28	$19,054.00	19.12%
MSFT	Sell	6/22/2009	3300	$22.08	$72,884.00	$23.28	$3,940.00	5.41%
MSFT	Sell	6/22/2009	1300	$22.83	$29,699.00	$23.28	$565.00	1.90%
QCOM	Sell	6/22/2009	2200	$46.00	$101,220.00	$44.40	-$3,540.00	-3.50%
TXN	Sell	6/22/2009	5500	$18.35	$100,945.00	$20.97	$14,390.00	14.26%
GLW	Buy	6/24/2009	6500	$15.42	$100,250.00	N.A.	N.A.	N.A.
DELL	Buy	6/24/2009	7500	$13.28	$99,620.00	N.A.	N.A.	N.A.
EMC	Buy	6/24/2009	7700	$13.00	$100,120.00	N.A.	N.A.	N.A.
INTC	Buy	6/24/2009	6200	$16.10	$99,840.00	N.A.	N.A.	N.A.
JNPR	Buy	6/24/2009	4400	$22.67	$99,768.00	N.A.	N.A.	N.A.
ORCL	Buy	6/24/2009	4700	$21.26	$99,942.00	N.A.	N.A.	N.A.
AAPL	Buy	6/25/2009	1400	$139.86	$195,824.00	N.A.	N.A.	N.A.
DHR	Buy	6/25/2009	1600	$61.72	$98,772.00	N.A.	N.A.	N.A.
GOOG	Buy	6/25/2009	300	$415.77	$124,751.00	N.A.	N.A.	N.A.
TMO	Buy	6/25/2009	2300	$41.79	$96,137.00	N.A.	N.A.	N.A.

HPQ had two groups of shares sold on June 22, 2009 due to supporting technical analysis; see Table 6.1 and Figure 5.6.

MSFT had three groups of shares sold on June 22, 2009 also because of supporting technical analysis; see Figure 5.3. The first group is the group of interest because it was one of the original investments. MSFT was sold due to declining technical measures. The original investment of MSFT was the most successful in the entire portfolio. MSFT added a 19.12 percent gain, totaling $19,054.00, to the portfolio; see Table 6.1. This one investment out of 40 provided approximately seven percent of all profits made by the end of the simulation.

QCOM was sold on June 22, 2009 after being held onto for only three-days. The MACD convergence that triggered the buying of this stock was a false signal; see Figure 5.13. This false

signal helped QCOM become the worse investment in this portfolio accounting for a 3.50 percent loss; see Table 6.1. Although this was the largest loss in the portfolio, it is relatively small in comparison to the high percentage gains made throughout the simulation.

TXN was the last of the 10 original investments to be sold on June 22, 2009 after being held for 27 days. On June 8, 2009 and on June 16, 2009, the MACD diverged past the trigger line, but the RSI was rising; see Figure 6.1. Because of this, TXN was not sold on those dates. This stock was sold on June 22, 2009 because all of the technical measures analyzed followed the common method that indicated a stock should be sold.

Figure 6.1: TXN - May 26, 2009 (buy) - June 22, 2009 (sell)

GLW, DELL, EMC, INTC, JNPR, and ORCL were all purchased on June 24, 2009 because they all had near perfect technical analysis that indicated a good time to buy; see Figures 6.2 to 6.7.

Figure 6.2: GLW - June 24, 2009 (buy) - July 1, 2009 (sell)   **Figure 6.3: DELL - June 24, 2009 (buy) - July 1, 2009 (sell)**

Figure 6.4: EMC - June 24, 2009 (buy) - June 30, 2009 (sell)   **Figure 6.5: INTC - June 24, 2009 (buy) - July 6, 2009 (sell)**
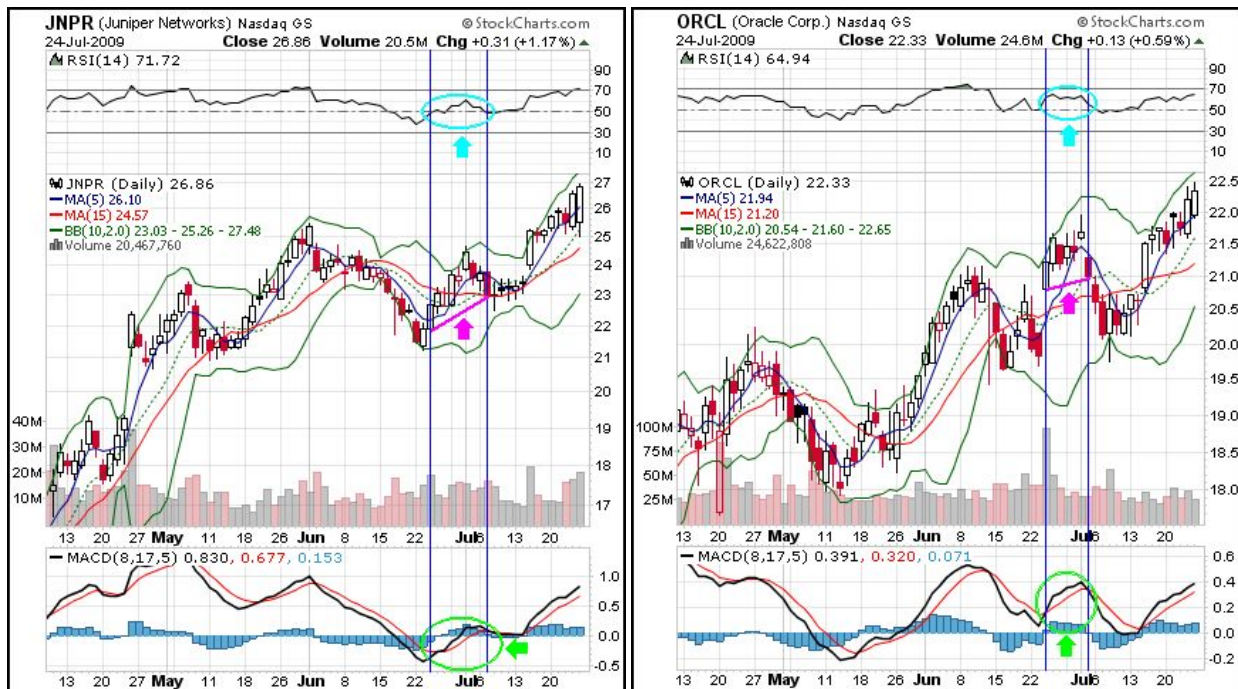
Figure 6.6: JNPR - June 24, 2009 (buy) - July 7, 2009 (sell)   Figure 6.7: ORCL - June 24, 2009 (buy) - July 2, 2009 (sell)

AAPL, DHR, GOOG, and TMO were all purchased on June 25, 2009; see Figures 6.8 to 6.11. All of these stocks also had superb supporting technical analysis that indicated a buy trigger.

Figure 6.8: AAPL - June 25, 2009 (buy) - July 2, 2009 (sell)

Figure 6.9: DHR - June 25, 2009 (buy) - July 1, 2009 (sell)

**Figure 6.10: GOOG - June 25, 2009 (buy) - July 1, 2009 (sell)**

Figure 6.11: TMO - June 25, 2009 (buy) - June 30, 2009 (sell)

6.3 Week 6: June 29, 2009 – July 2, 2009

Excluding INTC and JNPR, all of the stocks bought during the fifth week were sold throughout the sixth week. This week was filled with very minimal gains and three losses; see Table 6.2. This proved to be the most unsuccessful week during the simulation. At the end of this week, the available balance was $918,170.00.

Table 6.2: Week 6 Transaction Details

SYMBOL	Buy or Sell	Date	Amt. of Shares	Purchase Price Per Share	Total Cost	Closing Quote	Gain/Loss ($)	Gain/Loss (%)
EMC	Sell	6/30/2009	7700	$13.00	$100,120.00	$13.10	$750.00	0.75%
TMO	Sell	6/30/2009	2300	$41.79	$96,137.00	$40.77	-$2,366.00	-2.46%
GLW	Sell	7/1/2009	6500	$15.42	$100,250.00	$15.58	$1,020.00	1.02%
DHR	Sell	7/1/2009	1600	$61.72	$98,772.00	$61.17	-$900.00	-0.91%
DELL	Sell	7/1/2009	7500	$13.28	$99,620.00	$13.39	$805.00	0.81%
GOOG	Sell	7/1/2009	300	$415.77	$124,751.00	$418.99	$946.00	0.76%
AAPL	Sell	7/2/2009	1400	$139.86	$195,824.00	$140.02	$204.00	0.10%
ORCL	Sell	7/2/2009	4700	$21.26	$99,942.00	$21.04	-$1,054.00	-1.05%

All of the stocks that appear in Table 6.2 were sold because of their declining technical measures; see Figures 6.2 to 6.4 and 6.7 to 6.11. TMO suffered the greatest percentage loss this week of -2.46 percent; see Table 6.2. GLW had the largest percentage gain this week of 1.02 percent; see Table 6.2.

6.4 Week 7: July 6, 2009 – July 10, 2009

After just going through the most unsuccessful week, promising technical analysis measures surfaced half way through the seventh week. Majority of the transactions this week

were purchases; see Table 6.3. Each of the eight stocks purchased this week had low prices and great improving technical measures. This is something that was exciting to see as the final week of the simulation was approaching. A total of $203,678.00 was the available balance at the end of the week.

Table 6.3: Week 7 Transaction Details

SYMBOL	Buy or Sell	Date	Amt. of Shares	Purchase Price Per Share	Total Cost	Closing Quote	Gain/Loss ($)	Gain/Loss (%)
INTC	Sell	7/6/2009	6200	$16.10	$99,840.00	$16.54	$2,708.00	2.71%
JNPR	Sell	7/7/2009	4400	$22.67	$99,768.00	$22.98	$1,344.00	1.35%
GOOG	Buy	7/8/2009	500	$402.49	$201,265.00	N.A.	N.A.	N.A.
ADBE	Buy	7/10/2009	3600	$27.58	$99,308.00	N.A.	N.A.	N.A.
AAPL	Buy	7/10/2009	700	$138.52	$96,984.00	N.A.	N.A.	N.A.
CSCO	Buy	7/10/2009	5500	$18.34	$100,890.00	N.A.	N.A.	N.A.
GLW	Buy	7/10/2009	6800	$14.76	$100,388.00	N.A.	N.A.	N.A.
IBM	Buy	7/10/2009	1000	$100.83	$100,850.00	N.A.	N.A.	N.A.
JNPR	Buy	7/10/2009	4300	$23.20	$99,780.00	N.A.	N.A.	N.A.
MSFT	Buy	7/10/2009	5300	$22.39	$118,687.00	N.A.	N.A.	N.A.

INTC and JNPR were sold for slight gains at the beginning of the week due to their declining technical analysis; see Figures 6.5 to 6.6 and Table 6.3.

GOOG was purchased for the third time on July 8, 2009. The reasoning for purchasing GOOG this time differs from the others. The RSI was rising, but the MACD was not very close to converging, and the 5-day and 15-day SMA both had a negative trend line; see Figure 6.12. Coupled with the RSI rising, the extremely low stock price of $402.49 per share was the buy trigger used for this transaction. If the RSI was not rising, this purchase would not have been made.

Figure 6.12: GOOG - July 8, 2009 (buy) - July 16, 2009 (sell)

ADBE, AAPL, CSCO, GLW, IBM, and JNPR were all purchased on July 10, 2009 because their technical analysis measures were gaining quickly; see Figures 6.13 to 6.18.

Figure 6.13: ADBE - July 10, 2009 (buy) - July 20, 2009 (sell)

Figure 6.14: AAPL - July 10, 2009 (buy) - July 20, 2009 (sell)

Figure 6.15: CSCO - July 10, 2009 (buy) - July 20, 2009 (sell)

Figure 6.16: GLW - July 10, 2009 (buy) - July 20, 2009 (sell)

Figure 6.17: IBM - July 10, 2009 (buy) - July 16, 2009 (buy) - July 20, 2009 (sell)

Figure 6.18: JNPR - July 10, 2009 (buy) - July 20, 2009 (sell)

MSFT was also purchased on July 10, 2009. The technical analysis measures on this date were not great at all. RSI was flat lined, the MACD was still decreasing and not approaching the trigger line, the stock price dropped after a slight rise the day prior, and both SMA's were decreasing; see Figure 6.19. However, the seven current investments at that time had beta ratios of 0.79, 1.17, 1.18, 1.37, 1.43, 1.66, and 1.88. There was only one company with a very low beta ratio, and there were two companies with moderately high beta ratios. I decided to invest into a company with a low beta ratio to keep my risk low as I was approaching the end of the simulation. It was between MSFT and QCOM each with a 1.01 beta ratio. The current stock price of $22.39 per share on July 10, 2009 was the lowest it had been since June 9, 2009. The highest gain percentage of 19.12 percent belonged to MSFT. The entire market had recently been making large gains. Thus, I decided to make another investment with MSFT.

Figure 6.19: MSFT - July 10, 2009 (buy) - July 20, 2009 (sell)

6.5 Week 8: July 13, 2009 – July 17, 2009

The last week of trading had the least amount of trading activity thus far as seen in Table 6.4. One transaction was made this week with no regard to technical analysis. This was the only one in the entire portfolio. Impressive growths continued to take place this week in all areas of the stock market. After the last transaction was made this week, only $230.00 was available.

Table 6.4: Week 8 Transaction Details

SYMBOL	Buy or Sell	Date	Amt. of Shares	Purchase Price Per Share	Total Cost	Closing Quote	Gain/Loss ($)	Gain/Loss (%)
INTC	Buy	7/13/2009	6100	$16.49	$100,609.00	N.A.	N.A.	N.A.
QCOM	Buy	7/13/2009	2300	$44.31	$101,933.00	N.A.	N.A.	N.A.
GOOG	Sell	7/16/2009	500	$402.49	$201,265.00	$442.60	$20,035.00	9.95%
IBM	Buy	7/16/2009	900	$110.64	$99,596.00	N.A.	N.A.	N.A.
RIMM	Buy	7/16/2009	800	$72.23	$57,804.00	N.A.	N.A.	N.A.
TXN	Buy	7/16/2009	2900	$22.34	$64,806.00	N.A.	N.A.	N.A.

INTC and QCOM were purchased with the remaining cash on July 13, 2009. Both of these stocks had great supporting technical analysis; see Figures 6.20 to 6.21.

Figure 6.20: INTC - July 13, 2009 (buy) - July 20, 2009 (sell)   Figure 6.21: QCOM - July 13, 2009 (buy) - July 20, 2009 (sell)

GOOG was traded (Chan, 2009)on July 16, 2009. Not one technical measure even slightly indicated that GOOG should be sold on this date; see Figure 6.12. However, on the night of July 16, 2009, I saw an article about Google's second quarter results listed on the Google® finance website. The article originated from the world and finance online news website, Reuters. The article stated that during the aftermarket trading hours that GOOG shares were down two percent [3]. This was because investors were not happy with GOOG's three percent revenue growth [3]. Although this number was slightly above average, investors were expecting something bigger. GOOG is a very volatile and cyclical stock. GOOG was sold primarily due to the poor aftermarket results and news. If there were more than two trading days left to the simulation, GOOG would not have been sold.

IBM, RIMM, and TXN were bought on July 16, 2009 with two days left to the simulation. Each of these three stocks had quickly made huge gains since each of their MACD converged with their trigger lines; see Figures 6.17, 6.22, and 6.23.

Figure 6.22: RIMM - July 16, 2009 (buy) - July 20, 2009 (sell)   Figure 6.23: TXN - July 16, 2009 (buy) - July 20, 2009 (sell)

6.6 End of Simulation – July 20, 2009

All active investments were sold on the last day of the simulation, July 20, 2009. None of their technical analysis data indicated that they should be sold; see Figures 6.13 to 6.23. All of these investments would have continued to be active if the simulation did not end. Two thirds of the transactions found in Table 6.5 had gain percentages above nine percent. The average gain percentage of the final investments was 10.38 percent. The final portfolio balance was $1,264,569.00. This records a total profit of $264,569.00 and a gain percentage of 26.46 percent.

SYMBOL	Buy or Sell	Date	Amt. of Shares	Purchase Price Per Share	Total Cost	Closing Quote	Gain/Loss ($)	Gain/Loss (%)
ADBE	Sell	7/20/2009	3600	$27.58	$99,308.00	$31.21	$13,048.00	13.14%
AAPL	Sell	7/20/2009	700	$138.52	$96,984.00	$152.99	$10,109.00	10.42%
CSCO	Sell	7/20/2009	5500	$18.34	$100,890.00	$21.15	$15,435.00	15.30%
GLW	Sell	7/20/2009	6800	$14.76	$100,388.00	$16.90	$14,532.00	14.48%
IBM	Sell	7/20/2009	1000	$100.83	$100,850.00	$116.44	$15,590.00	15.46%
IBM	Sell	7/20/2009	900	$110.64	$99,596.00	$116.44	$5,200.00	5.22%
INTC	Sell	7/20/2009	6100	$16.49	$100,609.00	$18.90	$14,681.00	14.59%
JNPR	Sell	7/20/2009	4300	$23.20	$99,780.00	$25.72	$10,816.00	10.84%
MSFT	Sell	7/20/2009	5300	$22.39	$118,687.00	$24.53	$11,322.00	9.54%
QCOM	Sell	7/20/2009	2300	$44.31	$101,933.00	$47.03	$6,236.00	6.12%
RIMM	Sell	7/20/2009	800	$72.23	$57,804.00	$74.97	$2,172.00	3.76%
TXN	Sell	7/20/2009	2900	$22.34	$64,806.00	$23.61	$3,663.00	5.65%

7. Conclusion

This simulation focused solely on the technology sector of the stock market. Securities were traded for a period of eight-weeks beginning on May 26, 2009 and ending on July 20, 2009. Fundamental analysis was primarily used to filter out undesirable stocks and technical analysis was used to determine if a stock should be left alone, purchased, or sold. Posted news links found on the Google® finance website were continually reviewed to search for anything that might negatively or positively affect a stock price. All processed transactions and their supporting technical analysis triggers were recorded and discussed thoroughly. The technical analysis triggers were analyzed using charts that displayed several technical analysis measures. The portfolio was constantly being reviewed to be sure that the active investments were from a diverse group of technology subsectors and that there was a balance in beta ratios. Multitasking was a must for this project to be successfully executed. To help organize the simulation and to make things easier, nearly everything was recorded.

The goals of this project were to gain a better understanding of the stock market and how it works. Also, it was hoped to determine if fundamental and technical analysis can be successfully used together to generate profitable returns. A better understanding of the stock market and how it works was obtained before the simulation even began. This understanding grew immensely before and during the simulation as more extensive research was completed and more "hands on" experience was achieved. As for the second part of the goal, I found that this is still a great debate that continues today. Fundamental and technical analysts have nearly opposite job titles. Fundamental analysts deal with the present raw data of a company and technical analysts deal with past data and trends to determine future growth. Because this debate cannot be settled, several investment companies hire both the fundamental and the technical

analyst to determine good investment strategies. It would take far longer than eight weeks to be able to make a claim that these methods work best when used together than separately. For the sake of this simulation, the technology portfolio results will be discussed in more depth to draw potential conclusions if this simulation was continued for years after this end date.

A total of $1M was available for investing into technology stocks. By the end of the simulation, there was a total of $1,264,569.00 in the account. That is a $264,569.00 profit or a 26.46 percent gain. This is a huge gain to make especially in only eight-weeks. There were 40 total transactions made during these eight-weeks and each transaction had an average of a 6.59 percent gain. The highest gain percentage was made by the first investment, MSFT, for 19.12 percent, and the highest lost percentage was made by the second investment, QCOM, for negative 3.50 percent. A 3.50 percent loss is not that significant in such a large portfolio. Overall, the results obtained far exceeded any expectations. I can assure you that these results were not solely obtained because fundamental and technical analyses were used together.

It should be noted again that all of the original investments made took place at nearly the exact time that a buy trigger was found. This meant that the stocks were gaining strength and that they were bought at a low price. Also, remembering that technology stocks are primarily cyclical, lots of positive political and economical factors affected the performance of the technology sector during the simulation. A new President of the United States took office and a new economic stimulus bill had just been passed a short time before the simulation started. Gasoline prices had dropped. Hopes of the housing market recovering helped in the new positive trend of most large technology stocks. News concerning the Federal Reserve greatly influenced the trend of technology stocks. These few things mentioned greatly helped the stock market rise from record lows. When poor news was prevalent in any of these areas, the performance of

technology stocks would suffer. This is what happened to the stocks during the fourth to sixth week. Luckily, the stock market did not falter too much during those few weeks. The market then had a large and rapid rebound during the last two weeks of the simulation. The last two weeks of the simulation contributed to more than half of all profits made. This simulation might have been conducted during the most profitable time in the summer of 2009. Luck was a huge factor as to when this simulation was performed.

The joint use of fundamental and technical analysis allowed me to make better informed investment decisions. These methods give two different perspectives when analyzing stocks. When both of these methods gave supporting data toward a transaction, I felt more comfortable when making an investment decision. Although this conclusion cannot be fully applied to all investors until much longer and more extensive research is done on this matter, these methods assisted me in making the decision to buy or sell a stock at an ideal and profitable price.

This stock market simulation and this IQP project as a whole were very rewarding. With much dedication and work, a greater knowledge and applied experience in the stock market was gained. This knowledge and experience has rewarded me with basic investing skills that can help build the foundation needed to become a successful future investor.

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Appendix: A-1 Technology Portfolio Performance

Table A-1: Technology Portfolio Performance

									Total cost of accounts	$4,013,359.00			
	TECHNOLOGY PORTFOLIO PERFORMANCE								Value of accounts	$4,277,928.00			
	May 26, 2009 - July 20, 2009								Difference $	$264,569.00			
									Difference %	6.59%			
Investment Name	Symbol	Technology Subsector	Date Purchased	Date Sold	Number of Days Held	Quantity	Purchase Price Per Share	Trade Fees	Total Cost (Purchase Price + Fees)	Current Quote	Market Value	Gain/Loss ($)	Gain/Loss (%)
Apple, Inc.	AAPL	Computer Hardware	5/26/2009	6/10/2009	15	1200	$124.76	$20.00	$149,732.00	$140.25	$168,300.00	18,568.00	12.40%
Google, Inc.	GOOG	Computer Services	5/26/2009	6/9/2009	14	400	$391.95	$20.00	$156,800.00	$435.62	$174,248.00	17,448.00	11.13%
Intel Corp.	INTC	Semiconductors	5/26/2009	6/15/2009	20	5000	$15.01	$20.00	$75,070.00	$15.98	$79,900.00	4,830.00	6.43%
Int'l. Business Machines Corp.	IBM	Computer Hardware	5/26/2009	6/15/2009	20	700	$101.32	$20.00	$70,944.00	$107.62	$75,334.00	4,390.00	6.19%
Microsoft Corp.	MSFT	Software	5/26/2009	6/22/2009	27	5100	$19.54	$20.00	$99,674.00	$23.20	$118,728.00	19,054.00	19.12%
Oracle Corp.	ORCL	Software	5/26/2009	6/15/2009	20	4000	$18.46	$20.00	$73,860.00	$20.22	$80,880.00	7,020.00	9.50%
Qualcomm, Inc.	QCOM	Communications Equipment	5/26/2009	6/15/2009	20	1800	$40.73	$20.00	$73,334.00	$44.31	$79,758.00	6,424.00	8.76%
Texas Instruments, Inc.	TXN	Semiconductors	5/26/2009	6/22/2009	27	5500	$18.35	$20.00	$100,945.00	$20.97	$115,335.00	14,390.00	14.26%
Therro Fisher Scientfic, Inc.	TMO	Scientific & Technical Instr.	5/26/2009	6/15/2009	20	2700	$37.00	$20.00	$99,920.00	$40.42	$109,134.00	9,214.00	9.22%
Vmware, Inc.	VMW	Software	5/26/2009	6/11/2009	16	3500	$28.42	$20.00	$99,490.00	$32.13	$112,455.00	12,965.00	13.03%
Dell, Inc.	DELL	Computer Hardware	6/9/2009	6/15/2009	6	8000	$12.60	$20.00	$100,820.00	$12.87	$102,960.00	2,140.00	2.12%
Microsoft Corp.	MSFT	Software	6/9/2009	6/22/2009	13	3300	$22.08	$20.00	$72,884.00	$23.28	$76,824.00	3,940.00	5.41%
EMC Corp.	EMC	Computer Hardware	6/10/2009	6/16/2009	6	7700	$12.88	$20.00	$99,196.00	$12.62	$97,174.00	-2,022.00	-2.04%
Hewlett-Packard Company	HPQ	Computer Hardware	6/10/2009	6/22/2009	12	1900	$36.79	$20.00	$69,921.00	$37.74	$71,706.00	1,785.00	2.55%
Hewlett-Packard Company	HPQ	Computer Hardware	6/11/2009	6/22/2009	11	2200	$37.23	$20.00	$81,926.00	$37.74	$83,028.00	1,102.00	1.35%
Microsoft Corp.	MSFT	Software	6/11/2009	6/22/2009	11	1300	$22.83	$20.00	$29,699.00	$23.28	$30,264.00	565.00	1.90%
Qualcomm, Inc.	QCOM	Communications Equipment	6/19/2009	6/22/2009	3	2200	$46.00	$20.00	$101,220.00	$44.40	$97,680.00	-3,540.00	-3.50%
Corning Inc.	GLW	Electronic Instr. & Controls	6/24/2009	7/1/2009	7	6500	$15.42	$20.00	$100,250.00	$15.58	$101,270.00	1,020.00	1.02%
Dell, Inc.	DELL	Computer Hardware	6/24/2009	7/1/2009	7	7500	$13.28	$20.00	$99,620.00	$13.39	$100,425.00	805.00	0.81%
EMC Corp.	EMC	Computer Hardware	6/24/2009	6/30/2009	6	7700	$13.00	$20.00	$100,120.00	$13.10	$100,870.00	750.00	0.75%
Intel Corp.	INTC	Semiconductors	6/24/2009	7/6/2009	12	6200	$16.10	$20.00	$99,840.00	$16.54	$102,548.00	2,708.00	2.71%
Juniper Networks, Inc.	JNPR	Communications Equipment	6/24/2009	7/7/2009	13	4400	$22.67	$20.00	$99,768.00	$22.98	$101,112.00	1,344.00	1.35%
Oracle Corp.	ORCL	Software	6/24/2009	7/2/2009	8	4700	$21.26	$20.00	$99,942.00	$21.04	$98,888.00	-1,054.00	-1.05%

Table A-1: Technology Portfolio Performance

TECHNOLOGY PORTFOLIO PERFORMANCE

May 26, 2009 – July 20, 2009

								Total cost of accounts	$4,013,359.00
								Value of accounts	$4,277,928.00
								Difference $	$264,569.00
								Difference %	6.59%

Investment Name	Symbol	Technology Subsector	Date Purchased	Date Sold	Number of Days Held	Quantity	Purchase Price Per Share	Trade Fees	Total Cost (Purchase Price + Fees)	Current Quote	Market Value	Gain/Loss ($)	Gain/Loss (%)
Apple, Inc.	AAPL	Computer Hardware	6/25/2009	7/2/2009	7	1400	$139.86	$20.00	$195,824.00	$140.02	$196,028.00	204.00	0.10%
Danaher Corp.	DHR	Scientific & Technical Instr.	6/25/2009	7/1/2009	6	1600	$61.72	$20.00	$98,772.00	$61.17	$97,872.00	-900.00	-0.91%
Google, Inc.	GOOG	Computer Services	6/25/2009	7/1/2009	6	300	$415.77	$20.00	$124,751.00	$418.99	$125,697.00	946.00	0.76%
Thermo Fisher Scientific, Inc.	TMO	Scientific & Technical Instr.	6/25/2009	6/30/2009	5	2300	$41.79	$20.00	$96,137.00	$40.77	$93,771.00	-2,366.00	-2.46%
Google, Inc.	GOOG	Computer Services	7/8/2009	7/16/2009	8	500	$402.49	$20.00	$201,265.00	$442.60	$221,300.00	20,035.00	9.95%
Adobe Systems Inc.	ADBE	Software	7/10/2009	7/20/2009	10	3600	$27.58	$20.00	$99,308.00	$31.21	$112,356.00	13,048.00	13.14%
Apple, Inc.	AAPL	Computer Hardware	7/10/2009	7/20/2009	10	700	$138.52	$20.00	$96,984.00	$152.99	$107,093.00	10,109.00	10.42%
Cisco Systems, Inc.	CSCO	Computer Peripherals	7/10/2009	7/20/2009	10	5500	$18.34	$20.00	$100,890.00	$21.15	$116,325.00	15,435.00	15.30%
Corning Inc.	GLW	Electronic Instr. & Controls	7/10/2009	7/20/2009	10	6800	$14.76	$20.00	$100,388.00	$16.90	$114,920.00	14,532.00	14.48%
Intl. Business Machines Corp.	IBM	Computer Hardware	7/10/2009	7/20/2009	10	1000	$100.83	$20.00	$100,850.00	$116.44	$116,440.00	15,590.00	15.46%
Juniper Networks, Inc.	JNPR	Communications Equipment	7/10/2009	7/20/2009	10	4300	$23.20	$20.00	$99,780.00	$25.72	$110,596.00	10,816.00	10.84%
Microsoft Corp.	MSFT	Software	7/10/2009	7/20/2009	10	5300	$22.39	$20.00	$118,687.00	$24.53	$130,009.00	11,322.00	9.54%
Intel Corp.	INTC	Semiconductors	7/13/2009	7/20/2009	7	6100	$16.49	$20.00	$100,609.00	$18.90	$115,290.00	14,681.00	14.59%
Qualcomm, Inc.	QCOM	Communications Equipment	7/13/2009	7/20/2009	7	2300	$44.31	$20.00	$101,933.00	$47.03	$108,169.00	6,236.00	6.12%
Intl. Business Machines Corp.	IBM	Computer Hardware	7/16/2009	7/20/2009	4	900	$110.64	$20.00	$99,596.00	$116.44	$104,796.00	5,200.00	5.22%
Research In Motion Limited	RIMM	Communications Equipment	7/16/2009	7/20/2009	4	800	$72.23	$20.00	$57,804.00	$74.97	$59,976.00	2,172.00	3.76%
Texas Instruments, Inc.	TXN	Semiconductors	7/16/2009	7/20/2009	4	2900	$22.34	$20.00	$64,806.00	$23.61	$68,469.00	3,663.00	5.65%