Project Number: 49-DZT-0205

THE STOCK MARKET:

Using Strategies in a Simulation

An Interactive Qualifying Project Report

submitted to the Faculty

of the

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

by

Stacey Uy

Date: April 10, 2003

Approved:

Professor Dalin Tang, Advisor

1. Stock Market
2. Simulation
3. Strategies

Abstract

Background information and strategies of the stock market are discussed. A nine week simulation was performed after researching company information and strategies. The purpose of the simulation was to test a few strategies by creating a portfolio and making transactions based on those strategies. A conclusion was made from the simulation and the effects of the stock market on society and the effects of society on the stock market were discovered.

TABLE OF CONTENTS

List of Figures

List of Tables

Chapter 1:

Introduction

A stock market simulation is performed in this Interactive Qualifying Project. The introduction contains the objectives, plans, and structure of this IQP. The objectives will describe what we want to achieve when we are doing this project. The plans will describe what we will do to achieve those objectives. And finally, the structure will show how this project will be organized and written.

1.1 Objectives

The purpose of this Interactive Qualifying Project is threefold:

1) Educational value: to learn about the history of the stock market and how it works. Having a clear understanding of the background information of the stock market as well as knowledge of the terminology involved are important in investing. This, in turn, will help in further researching the different strategies and theories developed by analysts in the market. By presenting this information, readers of this project will also learn about the stock market.

2) Testing strategies: to research strategies and theories and to test them through a simulation. There are many different strategies developed by analysts. Some are useful,

some are not. The goal here is to decipher the differences between certain strategies and use them in a nine week stock market simulation.

3) Stock market effects: to find out how the stock market affects society and how society affects the stock market. Based on the simulation, trends can be seen by following the economy and events of the world. How did these trends based on company and world activities affect the stocks?

1.2 The Plan

To familiarize ourselves with the stock market, research needs to be done. By reading books and information on internet websites, knowledge of the background information about the stock market can be achieved. Further research will include strategies and theories that include microeconomic ideas of "bubbles", stocks and flows charts, and speculation.

Once the research has been done and strategies have been collected, a simulation can run. The simulation is a useful tool to test the strategies. Stocks will be selected based on certain stock selection strategies and for nine weeks, a portfolio will be managed. Transactions of buying and selling will be done based on other strategies. Graphs and charts are important to observe and analyze throughout the simulation. An indicator of the efficiency of these strategies would be how much money was gained or lost after the simulation ends.

Based on this simulation, we can learn about the trends and how they affect stock prices. World events, company activities, and industry business activities may have affected the prices. By analyzing the events that happened during the simulation, an explanation or theory can be developed to explain the results of the simulation.

1.3 Structure of the Project

This project can be divided into three parts apart from the chapter separation. The first part includes chapters one, two, and three. The first chapter is an introduction of the project. The second chapter deals with background information involving the history of the stock market and its components. This chapter includes information on the main stock exchanges: the New York Stock Exchange (NYSE), the American Stock Exchange, and a few others. Information on Wall Street and the Wall Street Journal is also included. Certain indexes like the Dow Jones Industrial Average and NASDAQ are described. The third chapter gives information on how to get started in the stock market industry. Important resources and terms are mentioned and an explanation of how the market works is described. We believe this would be valuable for beginners entering into the market.

The second part of the project contains chapters four, five, and six and goes into detail about the simulation. The fourth chapter gives stock market strategies including the fundamental approach, technical approach, and "random walk" theory as well as methods on stock selection. The fifth chapter gives background information on all the companies

that we chose for our portfolio during the simulation. There is also a description of the methods and strategies used for the simulation. Each transaction and reason for buying and selling certain stocks are described. The simulation is then analyzed for results in chapter six. Graphs and diagrams are produced and a thorough explanation of why certain price changes may be presented. In this chapter, trends are described.

The last part of the project is the conclusion and contains chapter seven. Chapter seven includes how the stock market affects daily life in society and firms and businesses. This will also include some examples of panics and crashes of the past. Finally, this chapter will contain a summary of the entire project highlighting the important information and a conclusion will be made including what was learned from doing this project and how the simulation was an effective tool.

Appendices will be included at the end of the project to include any tables, graphs, or charts that were mentioned or need to be presented. Also a glossary will be included in the appendices for terms that were used in the project as well as terms which may be useful to anyone dealing with the stock market. The terms in the glossary will include the important terms mentioned in the first part of the project as well as any supplementary information. The appendices will include any other information that needs to be stated, but could not be properly placed in the project. A bibliography acknowledging the resources used will be included. This will consist of books, web URL's, and other information.

Chapter 2:

Background Information

Before diving directly into the stock market, it is a good idea to research background information to get a clear understanding of how the market was created and how it works. This chapter gives the history of the stock market, from when it was just the concept of trading to the present day when stocks are bought and sold at exchanges. The histories of Wall Street, the New York Stock Exchange, and the American Stock Exchange are explained. This includes information about Charles Dow and the developments of the stock market. Following these histories are methods of how stocks are valued. Based on these methods, indexes are created to hold these values. The final sections of this chapter are descriptions of some of the more commonly used indexes.

2.1 History of the Stock Market: Beginning

The stock market is not a new concept. It was established centuries ago, although the concept of trading "stocks" was developed decades after. In 1531, Belgium was the first country to establish an "exchange". Soon, other countries followed. In 1602, shares of the East India Company were bought and sold. In London, the market centered on Exchange Alley and was similar to today's Wall Street in New York. In 1725, brokers

and investors did their business at Jonathon's Coffee House which was renamed "The Stock Exchange" in 1773 (Stock Market History 1).

2.1.1 Wall Street and the New York Stock Exchange

During the 1700's, America was just beginning in the stock market. The market in America was not fully developed. Wall Street was created in 1640 after a wall was destroyed in New York City. However, Boston was the financial center of America in the early 1700's and Wall Street did not become the financial center of New York until after the American Revolution when the United States began trading stocks. Before 1792, the wealthy had to buy or sell an investment by advertising or telling his associates and friends. The first organized stock exchange was created in 1792 in Castle Garden (now Battery Park). The wealthy could sell lottery tickets, bonds, and shares of stocks in banks. Twenty-four wealthy businessmen signed an agreement of rules, regulations, and fees. On 22 Wall Street, the Stock Exchange Office auctioned securities every day to the highest bidder. The seller of the stocks or bonds paid the exchange a commission for each stock or bond. In 1817, the office was renamed the New York Stock and Exchange Board. By 1863, the office had moved six times and was located at Wall and Broad Streets, where it does business today. The board was renamed the New York Stock Exchange (NYSE) in 1863 (NYSE 1).

2.1.2 American Stock Exchange

The NYSE was not the only exchange in America. The NYSE had competition from smaller exchanges in New York and other cities. The Curbstone Brokers was its toughest competitor. The Curbstone Brokers was one of the largest New York organizations that consisted of a group of securities dealers who did their business outside in all types of weather. They met at nights to auction shares based on prices set earlier in the day at the NYSE's auction. The Curbstone Brokers could sell as little as a single share at a time while the NYSE set a minimum of a hundred. The Brokers also dealt with stocks of smaller companies that the NYSE thought were not important enough to be listed on their board. In 1919, over one hundred years after they established their organization, the Curbstone Brokers purchased a building on Wall Street. In 1928, they changed their name to the New York Curb Exchange and conducted their business indoors (Stock Market History 1). By 1953 the Curb changed its name to the American Stock Exchange (AMEX).

2.1.3 Development of the Stock Market

As the stock market progressed in America, technological and systematical changes were made. Stock tickers were first introduced in 1867. In 1873, trading hours were set from 10:00AM to 3:00PM on weekdays and 10:00AM to noon on Saturdays. This was then changed to 10:00AM to 3:30PM on weekdays in 1952 and changed again

in 1974 to reflect current times: 10:00AM to 4:00PM on weekdays only. Another development included the first telephones installed on the trading floor in 1878. For more developments and facts see the timeline in the appendices (NYSE 1).

2.1.4 Charles Dow

Charles H. Dow was an important contributor to the development of Wall Street and the stock market in America. He was born in Sterling, Connecticut in 1851. He was a journalist who moved to New York in 1880 and found the Dow Jones Company. The Dow Jones Company was a financial news service which supplied the latest financial news through its *Wall Street Journal*, which was created in 1889. Dow was a behaviorist who believed earnings and dividends were the sole determinants of the value of a stock and these determinants should be studied carefully (Krow 10).

2.2 Values of Stock: Indexes

However, earnings and dividends are not the only determinants of the value of stocks. The usefulness of stock market indexes relies upon the positive relationship between returns to different securities. For example, the Dow Jones Industrial Average is based on a sample of stocks while the New York Stock Exchange Index is based on all the stocks it has listed. With certain indexes, sampling can have some problems. When

calculating values of stocks, indexes are influenced to a degree by which an analyzer can infer movements in excluded stocks based on movements in included stocks. For example, inferences can be made from the Dow Jones Industrial Average and Standard & Poor's Index with relation to the NYSE and AMEX indexes. The usefulness of indexes calculated from samples is determined by two ideas: 1) the fact that stocks of relatively few companies make up a large portion of the total stock value of all companies and 2) there is a tendency of all stocks to move together. These indexes depend on having some stocks being more important than others. If all stocks are of equal value then stock sampling is not useful (Lorie 153).

2.2.1 Weighted Value

The prices of stocks in an index are weighted. Certain stocks are more important than others and when the index is calculated, these stocks have significance in the computation. For example, the Dow Jones Industrial Average (DJIA) measures an individual stock's significance proportional to its price. There are two common ways to weigh the value of stocks: 1) according to market value and 2) assigning equal weights to equal relative price changes. The former is appropriate for indicating changes in the aggregate market value of stocks in the index. The latter is appropriate for indicating movements in prices of typical or average stocks (Lorie 155).

The changes in general market value are more important for studies of relationships between stock prices and events in the national economy. Value weighted

indexes have a desirable property of "macro consistency". Macro consistency is when all investors are able to hold portfolios in which individual stocks have a relative importance equal to the relative values of all outstanding shares. Value weighted indexes attach a great deal of importance to large companies with stocks. These larger companies behave differently from smaller company stocks. There is a smaller volatility in stock prices of larger companies and a greater tendency for the price of larger diversified companies to be moved by general trends in the economy. A property of value weighting is that there is an automatic adjustment for stock splits. If there is no change in the aggregate market value of outstanding shares of stock that split then its relative importance remains the same and the index is not affected.

Indexes based on equal weighting are better indicators of expected changed in randomly selected stock prices. They are more appropriate to compare portfolios with. The DJIA is not value weighted, but it produces similar results to value weighted indexes. Stocks included in the DJIA are very large companies and their movements are similar with respect to the volatility and trend of indexes based on value weighting. Indexes which are not weighted by market value have no automatic adjustment. If an adjustment were to change the relative importance of a split stock then it may impart a bias to the index. This, in turn, would make the index untrustworthy. In the DJIA, if the stock splits, the divisor used in calculating the average is changed. To avoid a big change in the value of the average because of the split stock, an adjustment is necessary. This adjustment, however, produces a bias and reduces the importance of the stock and may make it behave differently (Lorie 160).

2.2.2 Methods of Averaging and Indexes

There are two methods of averaging in indexes: arithmetic and geometric means. Most indexes are based on the arithmetic method like the NYSE index, AMEX index, Standard & Poor's (S&P), and DJIA. There are only a few based on the geometric method and the most notable is the Value Line 1400 Composite Average. The arithmetic and geometric means are different from the calculated average. The arithmetic mean is calculated by dividing the sum of the stock prices by the number of stocks and the geometric mean is calculated by taking the n^{th} root (number of stocks) of the product of the stock prices. However, the index is constructed by assigning an arbitrary number that is usually rounded to the index value before and after certain points in time. The geometric method increases slowly and decreases more quickly than the arithmetic method. The degree of divergence increases with the degree of variability in component prices (Lorie 178).

2.2.3 Dow Jones Industrial Average

The following are important indexes that investors and brokers study in order to see how the market is doing. These indexes reflect stock prices and their values. The Dow Jones Industrial Average is the most familiar of stock price measurements and most widely used. It is quoted by professional investors as well as common people. However, it is often misunderstood. Its measure is the arithmetic average of thirty industrial stock

companies and a particular stock's influence on the change in the average is proportional to its stock price. The DJIA was created in 1884, in a daily letter by Dow Jones and Company, Inc. At this time it had eleven stocks which expanded to twelve a few years later. By 1916, the DJIA consisted of twenty stocks and by 1928 it consisted of thirty. These stocks are usually substituted for different ones as years pass. Only one stock from the original eleven remain in the present thirty, General Electric (Thomas 1).

Originally the DJIA was computed by summing the prices of the component stocks and dividing the sum by the number of included stocks. Adjustments for stock splits or dividends of ten percent or more were made by multiplying the new price of the affected stock by a certain factor. By 1928 the method was changed. Instead of summing the prices with multipliers and dividing by the number of stocks, the price totals without multipliers have been divided by a number. The average is adjusted so that it is unaffected on the day a stock splits. Each stock split or dividend reduces the divisor. For example, if stocks are priced at $25, $50, and $75 the average is $50. However, if the $75 stock splits three ways where each split are worth $25 then the divisor needs to be changed from three to two to keep the average the same (Krow 19). As the divisor approaches zero, the index average is more distorted. The change in divisor reduces the importance of split stocks relative to other stocks. Since a dollar movement in the price of a hundred dollar stock counts equally with a dollar movement in the price of a twenty dollar stock, the DJIA is sometimes considered a price weighted index. This average is misunderstood by many for an actual stock price average. In 1982 the DJIA stocks consisted of twenty-three percent of the New York Stock Exchange so it did not represent

the average portfolio and was a poor measure of the actual stock price average (Lorie 185).

2.2.4 Standard & Poor's 500 Composite

The Standard & Poor's 500 Composite (S&P) contains four hundred industrial companies, forty utility companies, twenty transportation companies, and forty financial companies. Its relative importance of component stock prices is determined by the values of outstanding shares. It is often referred to as a "base-weighted aggregative" index, but its value is adjusted for stock dividends, new issues, etc. In 1941-1943, the aggregate market value of stocks in the index was expressed as a percentage of the average market value. This percentage was then divided by ten to put the index in line with the actual average of stock prices. The S&P's coverage is broad and the weighting is clear. There is no need for adjustments when stocks split. The S&P is calculated by multiplying the stock prices with the number of shares that the public owns. The companies with the most shares dominate the market weighted index. The S&P is criticized, however, for having large companies that dominate the index and its value weights can create a bias (S&P 1).

2.2.5 New York Stock Exchange Composite

The New York Stock Exchange Composite was created in 1965. The NYSE Composite includes all common stocks in the exchange and is similar to the S&P 500 Composite. The NYSE Composite is an index of market value. It is a value weighted price index intended to measure the changes in the average stock price that results from market action alone. With this index, there is no need to make adjustments for splits, but the base is adjusted to account for any changes in capitalization and new listings or de-listings. The adjustments are made so that the relationship between the adjusted base value and the current market value after the change is the same as that between the current market value before the change and the previous base value. This index is only affected by price changes in the market. The base period of the index was set at 50 on December 31, 1965, when the actual stock price average was $53.33 (Lorie 190).

2.2.6 American Stock Exchange Index

The American Stock Exchange index was created in 1966. The AMEX index includes all common stocks in the exchange. It is an unweighted index of price movements of all its traded stocks and warrants. It is computed by adding and subtracting the average net price change each day to the previous index value. Since only net changes are considered, the relationship of the net change to a stock's price is not considered. The use of the net price change features many advantages: 1) it avoids the problem of splits

because the only time the index is affected is the day after the split, and 2) the previous day's closing index is adjusted when stock splits, stock dividends, or cash dividends occur. When new listings appear, the divisor used to obtain the average net change is increased correspondingly. The base price was set to $16.88 on April 29, 1966. The AMEX index changed in 1973 to a value weighted index of prices. It became similar to the NYSE index (Lorie 190).

On January 2, 1997, AMEX introduced a new index: the XAX. The XAX is a market capitalization-weighted, price appreciation index. It replaced the AMEX Market Value Index (XAM) which had been calculated on a total return basis to incorporate dividends. The XAX is similar to other indexes which only take into account the price changes of its component stocks.

2.2.7 Value Line 1400 Composite Average

The Value Line 1400 Composite Average was created in 1963. It consists of 1400 stocks in sixty industries. It is the only widely used index using the geometric method of relative price changes using its component stocks. The adjustment of stock splits and dividends is made by adjusting the stock's closing price on the previous day to compute the relative change (Lorie 191).

2.2.8 NASDAQ Composite Index

The National Association of Securities Dealers Automated Quotation System (NASDAQ) index is an American market for over-the-counter (OTC) securities. It measures domestic and non-U.S. based common stocks listed on the NASDAQ Stock Market. The index is market-valued weighted. Each company's security affects the index in proportion to its market value. The index tracks the stocks on its own stock market and contains over five thousand companies today. Since this index includes many companies in the technology industry where market trends change quickly, the index is very volatile. NASDAQ is a subsidiary of the National Association of Securities Dealers (NASD) and is monitored by the Securities and Exchange Commission (SEC) (Nasdaq 1).

2.3 Conclusion

These are only a few of the many indexes available in the stock market. Because of the way the stocks are valued, these indexes are helpful in seeing how the market is doing on a given day, week, year, etc.

This chapter gave information on the history of the stock market and some of its exchanges. The stock market concept is centuries old, but has technologically developed. Stock exchanges like the NYSE and AMEX have evolved through the years. This chapter also gave an explanation on how stocks are valued and how those values are reported through indexes. Stocks can be valued through weighted market value measurements or

through equal weighted measurements. Indexes can be calculated through the arithmetic mean or geometric mean and usually done through sampling certain stocks. Stocks in the indexes are valued differently depending on the index. The histories of some indexes are then given which include the DJIA, S&P, and NASDAQ. Now that enough background information on the history of the market has been given, the next chapter will describe what a novice investor needs to know before investing.

Chapter 3:

How to Get Started in the Stock Market

The following chapter is a helpful guide for beginners of the stock market. This chapter gives resources available including magazines, newspapers, and stock market reports. Following the resources section are definitions and explanations of important terms that are important to know or are frequently used in this project. A description of how the market floor works when buying or selling stock is given next. After this information is presented, a beginning investor is ready to receive information on stocks. This chapter also includes a description of the different categories of stocks and how they relate to economy and the industries they are in. The final section of this chapter gives details on how to prepare a portfolio.

3.1 Data Sources

Some important sources of information can be found in magazines, newspapers, reports, and the internet. The following are just some of the many resources available. The *Value Line Investment Survey* covers 1700 stocks and its data is updated quarterly. It gives weekly reports with an index of recent earnings and dividend figures and contains historical financial data, descriptions of companies, and predictions of company earnings (Jenks 41). The S&P gives small format stock report cards and weekly issues of *Earnings*

Forecaster. The *Earnings Forecaster* contains estimates made by the number of leading investment firms on a large number of stocks (Jenks 37).

Other data sources include newspaper periodicals. The *Wall Street Journal*, distributed by the Dow Jones company, has financial and business news. The Dow Jones company also distributes a weekly paper called the *Barron's*. The *Barron's* contains volumes of financial data. Other newspaper periodicals include the *Wall Street Transcript* and *Business Week*. The *Wall Street Transcript*, although expensive, is full of analyst's reports and *Business Week*, published by McGraw-Hill, contains useful information. The *New York Times* also has an informative business section (Jenks 38).

Brokers may also be helpful in obtaining information. Brokerage firms distribute reports that are informative since they specialize in particular industries. They are experienced and well-acquainted with certain companies and their senior management. They are well informed and study the industry carefully and diligently. They study data on the supply and demand of products and services and watch the trends of prices. They check with customers and meet often with management. They are responsible for estimating earnings for the next quarter and current year. They use computers to make models of company earnings and predict future earnings under various economic and industry conditions. However, brokers are not fully trustworthy. They have analyst problems: they do not know when things go bad, they do not tell individuals when to sell, they have too few negative reports on companies because they do not want to ruin their company acquaintanceship, and they are too optimistic (Jenks 40).

3.2 Common Terms

Before investing in the stock market, there are some important terms to know. The following is just a few of the terms that will be useful. For more terms that may be useful with the stock market, see the glossary in the appendices of this project.

Analyst: an analyst is a person with the knowledge in evaluating financial investments. He performs investment research and makes recommendations to investors to buy, sell, or hold. Most analysts concentrate on a single industry and are helpful in getting company data. Analysts can be referred to as brokers.

Assets: an asset is any possession that has value in an exchange. It can be money, stocks, bonds, or property.

Diversification: diversification is the spreading of investments over more than one company or industry to reduce the uncertainty of future returns caused by unsystematic risk.

Dividend: a dividend is the distribution of earnings to share holders, divided by the class of security and issued in the form of money, stock, property, etc. The amount is decided by the Board of Directors and is usually paid quarterly. Mutual fund dividends are paid out of income from the fund's investments.

Earnings Per Share (EPS): EPS is the portion of a company's profit allocated to each outstanding share of common stock. Reported or estimated net income for a period of time is divided by the total number of shares outstanding during that period.

Equity: an equity is an ownership interest in a corporation in the form of stock. It is also the total assets minus the total liabilities.

Market Value: the market value is the market price. The market price is the price buyers and sellers trade similar items in an open marketplace. The market value is the current market price of a security as indicated by the latest trade recorded.

Price/Earnings Ratio (P/E): the P/E a statistic in which the current price of a stock is divided by the earnings per share for a particular year. It is also called the "multiple". Reports show the P/E of the most recent year for actual figures, estimated value of the current year, and projected value of the following year. Investors compare the P/E's of stocks with past P/E's and present P/E's of other stocks or with market averages. The P/E is a measure of price. It does not tell whether a stock should sell at a market multiple or higher or lower than that.

Sampling: sampling is the process of selecting a subset of a population. It can be random. The usefulness of a sample depends upon its representativeness, or the degree to which one can make inferences about the excluded population on the basis of the sample. Many stock market indexes use sampling in their calculations.

Security: a security is an investment instrument issued by an organization which offers evidence of debt or equity. It is any note, stock, bond, etc and can be property which is pledged as collateral for a loan.

Shares Outstanding: shares outstanding are the shares of a corporation's stock that have been issued and are in the hands of the public. Also called outstanding stock

Stock: a stock is an instrument that signifies ownership in a corporation, and represents a claim on its proportional share in the corporation's assets and profits. Ownership in a company is determined by the number of shares a person owns divided by the total number of shares outstanding.

Stock Dividend: a stock dividend is issued capital given to stockholders. It is paid as additional shares of stock rather than as cash. Cash dividends are taxable while stock dividends are not taxed until the shares are sold.

Stock Splits: a stock split is the subdividing of outstanding stocks without changing the issued equity.

Volatility: volatility is the degree of price fluctuation for a given asset, rate, or index. It is usually expressed as a variance or standard deviation.

Volume: volume is the number of shares, bonds, etc, traded during a given period, for a security or an entire exchange.

Yield: yield is a return on an investor's capital investment. The yield is calculated by dividing the dividend by price. It is a bond term, taking into the account any discount or premium in price of a bond compared to the par value it will pay at maturity. A high yield may mean the dividend is in trouble.

3.3 How the Floor Works

Knowing how the floor works in exchanges like the NYSE is important because it gives investors more time to focus on their portfolio rather than worrying if their orders

to buy and sell stock are being made. In the NYSE, an investor places an order to buy or sell shares of a company with the NYSE Member brokerage firm. The firm then checks the investor's account and enters in the bid-asked pricing information and other details. The order is stored in the Order Match System and then sent to the NYSE trading floor via computer or telephone. The order is then sent electronically to a broker's booth or trading post specialist's display screen. If the order is sent to the specialist, the specialist makes the trade in an agency auction market and gets a better price for the investor. If the order is sent to the booth, the broker contacts the floor broker via pager or telephone to inform him that a new order has been placed. The floor broker takes the order to the trading post where the stock is traded, and he competes with other brokers for the best price for the investor. Once the trade is completed, a transaction report is sent to the firm who then changes the investor's account for the number of shares that were bought or sold. The investor receives a trade confirmation from the firm. If shares were bought, the investor submits payment. If shares were sold, the investor's account is credited (NYSE Trading 1). Even though the process sounds time consuming, it is fairly quick. Shares can be bought or sold in less than five minutes.

3.4 Categories of Stocks

Before choosing which stocks to invest in, more information is necessary. Stocks are classified into seven categories: there are five major groups, one minor group, and a miscellaneous group. The five major groups are Basic, Consumer, Technology, Energy,

and Interest Sensitive. The minor group is the Inflation Beneficiaries. Here is the list of stock descriptions:

I. BASIC – Companies that produce products or services sold to other businesses or durable goods sold to the consumer, generally cyclical.

1) Machinery and heavy equipment: Caterpillar Tractor.

2) Basic chemicals, plastics, and fibers: Dow Chemical.

3) Electrical equipment and appliances: General Electric.

4) Automobiles, trucks, and parts: General Motors.

5) Aerospace

6) Business services except advertising media.

7) Transportation

8) Specialty chemicals

9) Sales of such products

II. CONSUMER – Companies that produce consumable or low priced products that are usually advertised and are not very cyclical.

1) Soft drinks: Coca Cola.

2) Drugs, hospital, and health care products: Merck.

3) Tobacco and brewing: Philip Morris.

4) Household and personal products: Proctor & Gamble.

5) Containers and packaging

6) Food

7) Consumer goods sales

8) Entertainment, advertising media, and services

9) Hospitals

III. TECHNOLOGY – Companies producing components and equipment with a high technology content, sold primarily to other businesses. They are usually capital goods and range in cyclicality.

1) Electronic instruments: Hewlett Packard

2) Computers and office equipment: IBM

3) Oil industry technical services: Schlumberger

4) Integrated circuits and components: Texas Instruments

5) Computing services

6) Military electronics

7) Technology sales

8) Crime prevention devices and services

9) Communication devices

IV. ENERGY- Oil, gas, coal, uranium, and products and services for producing them, also means of transportation. They are moderately cyclical and price sensitive.

1) Integrated oils: Exxon

2) Oilfield equipment and supplies: Halliburton

3) Nonintegrated oil and gas producing: Superior Oil

4) Natural gas transportation and production: Tenneco

5) Coal and uranium mining

6) Transportation of coal and oil

V. INTEREST SENSITIVE – Companies that deal in money and credit or are especially sensitive to the availability and cost of credit.

1) Financial services with the public: American Express

2) Insurance: American International Group

3) Regulated utilities

4) Banking: BankAmerica

5) Building and building supplies

6) Consumer credit

7) REITs

8) Insurance agencies

9) Savings and loan

VI. INFLATION BENEFICIARIES – Products that are perceived to rise in price more than the inflation rate and benefit from a weak dollar.

1) Gold, silver, and gem mining

2) Nonferrous and strategic metals

3) Land holding concerns

VII. MISCELLANEOUS – No where else classified (Jenks 127).

The factors affecting the Basic group are: the strength of the United States dollar, how the financial problems of countries like Mexico are handled, and they benefit from a lower inflation and declining interest rates. The Consumer group is less sensitive to the business cycle – the changes in inflation and interest rates being the factors in stock prices – than the Basic group. They benefit from lower raw material costs and when consumer prices are stronger than producer prices. They are not overpriced or overvalued. High interest rates and a strong dollar affect them, but not as strongly as the other groups. The Technology group is usually overpriced. Like the Basic group, foreign competition resulting from a strong dollar causes problems for businesses. There is usually a speculation to buy new items in the Technology group. However, the risk to reward ratio is favorable in the long term. The Energy group is based on current trends. The Interest Sensitive group is sensitive to long and short term rates. The Inflation Beneficiaries group benefits from an economy that has more inflation.

3.5 Portfolio

Once an investor knows the different groups of stocks, he is ready to look into portfolios. An investor needs to be organized and have a plan before buying stocks. Therefore, the investor needs to research companies' background information. The investor also needs to keep track of the stocks he selected. A portfolio is the collection of investments, in this case stocks, owned by the investor.

There are some internet resources that can help an investor keep track of his portfolio. Two good sources are www.quicken.com and www.money.cnn.com. An investor can create a portfolio and the website will automatically update the prices on a daily basis. A portfolio helps organize important information like the price per share, volume, highs/lows, etc.

It is important to manage the portfolio by examining it every day and make necessary transitions. This section explained how useful portfolios are. The next chapter will show how to make one by describing methods of stock selection and well as strategies involved with stocks.

3.6 Conclusion

This chapter gave more information on the stock market. The information in this chapter can help a novice investor get started in the stock market. Important data resources were given such as the *Wall Street Transcript* or *New York Times*. A description of what brokers do was also presented. Some common stock market terms were defined in this chapter with more definitions being in the appendices. This chapter also gave an explanation of how the floor worked at the NYSE and different categories of stocks. Finally, this chapter gave an introduction about portfolios.

The next chapter will describe how to select stocks and what some strategies are to "beat the market". Once an investor finishes reading the next chapter, he will have enough knowledge to begin investing.

Chapter 4:

Strategies

The previous chapter described background information on the stock market and described how it works. The stock market changes often and is very hard to predict. Every week, prices of stocks plummet or rise for various reasons. Some reasons can be explained through events of that stock's company or industry, or events of the world. Sometimes, these reasons are unknown. The market is volatile and the prices of stocks fluctuate. Investors in the stock market can win big or lose big. Many analysts have developed strategies and theories to "beat" the market. These ideas are developed to help investors reach their goal: making money. This chapter will discuss a few.

This chapter discusses three strategies: technical approach, fundamental approach, and the "random walk" approach. Certain strategies for the stock market will be described for each approach. We will indicate which strategies we will use for our simulation (chapter 5). Finally, the stock selection methods will be given.

4.1 Three Approaches

There are three "schools" of stock market analysis: technical, fundamental, and random walk. Each school has different strategies. The technical approach deals with judgment. This method proposes studying the market rather than the company or the

economy. From the market's history, a technician behaviorist tries to forecast trends and prices. They study market data and not business records or company prospects. They believe the market is the best forecaster of trends and they are concerned with how the market moves, not why.

The fundamental approach deals with investment values, earnings, dividends, assets, managerial abilities, trends, national economy, and corporate securities. Fundamentalists study economic, financial, and scientific data. This data includes sales data, profitability ratios, new products, managerial abilities, profit statements, and industry surveys. From analysis of these data, they can forecast and project profits. An example of data that fundamentalists study is the price earnings ratio which was defined in chapter three:

$$\text{Price Earnings Ratio} = \frac{\text{Price per share of stock}}{\text{Latest fiscal year's earnings applicable to stock}}$$

Fundamentalists believe that market prices are based on supply and demand.

The technical approach and fundamental approach are complementary. The fundamental approach is used mainly for the long term while the technical approach is used mainly for clusters of short terms for the future. However, the fundamental approach may be used for short term and technical approach may be used for long term.

The random walk theory states that the stock market is unpredictable and is a game of chance. It deals with random fluctuations and microeconomic ideas of speculation, randomness, game theory, and perfect competition. The stock market

represents a perfectly efficient market in which the presence of analysts will instantaneously adjust market prices to whatever new information is available (Krow 3).

4.2 Technical Approach Strategies

The following are different strategies of the technical approach. These will include Dow's Theory, the Moving Average Line, and other ideas. For our simulation, we will use some ideas of Dow's Theory, the Moving Average Line, and the Trading Volume Method.

4.2.1 Dow's Theory

Dow's Theory is a mechanized technique for recognizing trends using previous high and low points in averages as benchmarks. Dow's Theory is separated into seven sections: Role of Averages, three types of markets, confirmation by the averages, trends based on the averages, Law of Action and Reaction, lines, and individual stock action.

The Role of Averages is a doctrine that states the stock market reflects everything that everybody knows about the economic status of the country. It is expressed constantly in price changes and equities. People who control and manage the companies or the banks that finance them have the most information and that information shapes the stock market. The averages transmit more information about the United States economy than

what is known to any individual. It predicts the trends of future stock prices and the future course of business activity in the country.

The three types of market are: a) a broad primary trend either going up or down that lasts for about a year or more, b) a shorter secondary trend that moves in the opposite direction during a broad primary trend, and c) very short term fluctuations that last for a few hours or days. These three can be referred to as major, intermediate, and minor. The most important of the three is the broad primary trend. Dow's Theory states that there is no technique to predict the amplitude or duration of a broad primary trend. However it usually lasts for more than a year. An upward primary trend that has an unbroken series of higher highs and higher lows and where each up thrust is higher than the last is called a bull market. The opposite of a bull market is a bear market. The shorter secondary trend usually lasts three to twelve weeks. During secondary trends the market goes down during bull markets and up during bear markets. The market then falls back to the primary trend. Secondary trends are important because they may become the first stage of a new primary trend in the opposite direction. The third type of market is not too important since it only lasts for a short period.

Dow's Theory believes that there needs to be conformity of the averages. If they are heading in the same direction then they may be able to predict the trends, but if one is heading in the opposite direction then they are deceptive. If the averages agree with each other then the trends can change direction.

The Law of Action and Reaction is a statement of the incidence of secondary movements. It is the only measuring element in the Dow Theory and states that any primary movement is subject to periodic interruptions by counter movements that are

likely to retrace one third to two thirds of the original move before moving back to the primary direction again.

A "line" in Dow's Theory is a period of relative inactivity in the stock market in which the price movement was limited to a minimum. These periods occur when the supply and demand are in equilibrium. Any movement in either direction away from the line indicates the direction of the next major trend. Dow's Theory is not applied to individual stocks. It is applied to stocks as a whole (Krow 21).

To summarize, Dow's Theory believes in averages. If the averages move in the same direction, then Dow theorists can predict trends. Trends can be grouped into three types: a long primary trend through a bull or bear market, a shorter secondary trend moving in the opposite direction as the primary trend, and minor fluctuations. Lines are important in predicting trends and stocks are studied as a whole. We will use the ideas of bull/bear markets and primary/secondary trends in our simulation.

4.2.2 Moving Average Line

The Moving Average Line is another strategy in the technical approach. Its computation is simple and straightforward. Take any period of time, for example, thirty weeks. At the end of each week, record the closing price. Calculate the average of the thirty closing prices. At the end of the thirty-first week, record the closing price and add it to the previous thirty prices while subtracting the first week's price. Divide the sum by thirty to get a new average. Repeat the process each following week, adding the new

week's closing price while subtracting the oldest week's price and dividing by thirty. This is called the 30-week line and is a moving average of the stock average. A moving average can be done with any number of weeks or days.

The Moving Average Line is important in distinguishing bull and bear markets. There are six rules in applying the Moving Average Line and the stock market average:

1) A bull market exists if the stock average stays above a rising moving average line.

2) A bear market exists if the stock average stays below a falling moving average line.

3) There may be an intermediate decline in a bull market if the stock average exceeds the moving average line by more than ten percent.

4) There may be an intermediate rise in a bear market if the stock average falls below the moving average line by more than ten percent.

5) The end of a bull market and the beginning of a bear market can be forecasted if the rising moving average line flattens out and falls after the stock average line intersects it from above.

6) The end of a bear market and the beginning of a bull market can be forecasted if the falling moving average line flattens out and rises after the stock average line intersects it from below.

The Moving Average Line can be applied to individual stocks as well as stocks as a whole. It is also useful to apply this to the stock market indexes (Krow 49). We will use a 10 Day Moving Average Line for individual stocks during our simulation.

4.2.3 Other Technical Strategies

The following are strategies including the High/Low computation and Trading Volume method.

The High/Low computation is dependent on the number of new highs and high lows of stocks. Each day the number of new highs and new lows are counted. If the number of new highs exceeds the number of new lows (or vice versa) uninterruptedly for three or more months, then the first appearance of the reverse situation suggests a possibility of an upcoming change in the climate of the market (Krow 101).

The Trading Volume method involves the transactions of stocks on a daily basis. Volume, as defined in chapter three, is the number of shares, bonds, etc, traded during a given period for a security or an entire exchange. It is important to analyze the volumes of stocks and the variations of the volume daily. If the volume of a stock suddenly rises and is over fifteen percent of the shares listed on the exchange, then an abnormality has occurred. This stock is likely to be followed by periods of lower volume. If the volume of the stock is lower than usual, then the stock is likely to be followed by periods of normal or an increased volume. Predictions can be made from the volumes because high volumes usually characterize price advances while low volumes characterize price declines. Thus, price and volume are directly proportional to each other.

From the Trading Volume method, some observations can be made:

1) Since price and volume are directly proportional to each other, a price advance during a low volume and a price decline during a high volume are suspect. A change in either price or volume may happen soon.

2) An extremely high or low volume is not usual. Therefore, a change in the direction of the trend when either a high or low volume dominates for a long period may happen soon.

3) However, if the volume remains normal, then there is no indication on the behavior of the market or its prices (Krow 110).

4.3 Fundamental Approach Strategies

The following are different strategies of the fundamental approach. These will include trends and the use of charts, when to buy and sell, and other strategies. For our simulation, we will use the Vertical Line Chart and ideas from the Buy and Sell Tactics as well as round lot purchases.

4.3.1 Trends: Vertical Line Chart

For individual stocks, the use of charts is important. One useful chart is the vertical line chart. The vertical line chart contains vertical lines that signify the amplitude for the high and low of a stock's price each day. The closing price for the day is noted on the vertical line by a horizontal line. The vertical line chart is important for many reasons:

1) The vertical lines form a path. Trends can be deduced from this path.

2) Once a trend is started, it does not easily change.

3) The trend does not end until there is technical proof.

4) The trend is similar to the moving average line.

5) The major trend is usually countered by smaller moves in the opposite direction. These may retrace one third to two thirds of the major trend.

6) A trend will eventually move into the opposite direction.

7) Stocks that are performing better than the market are likely to continue for a while and stocks performing worse than the market are likely to continue poorly (Krow 163).

From the vertical line chart, a trend can be observed. Lines can be drawn from these trends. These lines are called trendlines. The trendlines may be an uptrend, up-curving trendline, downtrend, or down-curving trendline. With the uptrend and downtrend, the vertical lines usually form a linear path. An uptrend line connects the lows of the trend and is a positive sloped line. The downtrend line connects the highs of the trend and is a negative sloped line. With the up-curving and down-curving trends, the vertical lines usually form a curved path. The up-curving trendline connects the lows and increases. The down-curving trendline connects the highs and decreases. From these trendlines, it is best to buy the stock at the bottom and sell at the top of the trend.

The trends may reverse their patterns. There are two types of reversal patterns: top and bottom (for pictures of these see the appendices). Top reversal patterns consist of the spike top, double top, head-and-shoulder top, and rounded top. The spike top rises and falls at a point. The double top rises and falls twice. The head-and-shoulders top is a spike top multiple times. The rounded top rises and falls, but is flatter than the spike top. Bottom reversal patterns include the v-bottom, double bottom, head-and-shoulders bottom, saucer bottom, and coil bottom. The v-bottom falls then rises at a point. The

double bottom falls and rises twice. The head-and shoulders bottom is a v-bottom multiple times. The saucer bottom falls and rises, but is flatter than the v-bottom. The coil bottom is similar to the sine wave, except the amplitude gets smaller with each period (Krow 172).

4.3.2 Buy and Sell Tactics

When choosing stocks, there is a need to know when to buy and sell. There are three methods of buying and selling that will result in a profit: a) "buy low, sell high", b) "buy high, sell higher", and c) "just buy, and don't sell". The first succeeds when buying at the end of a bear market and selling at the end of a bull market. The second succeeds when an investor buys the best performing stocks when the prices are down and sells when they go up. He does not buy when prices are heading up and sell because he is afraid that they will reach new lows when they are going down. The third succeeds with good timing and if the investor plans on holding a stock for a long period. An important aspect of knowing when to buy and sell comes from business cycles. Market activity bottoms and advances right in the middle of recessions when economic news is at its worst. Knowing when to buy and sell is important.

4.3.3 Other Fundamental Strategies

Other fundamental strategies and theories include the odd lot, short sale, and 80:20 theory. When an investor buys an odd lot, the number of shares bought is less than one hundred. Transactions on odd lots are different than transactions on round lots (hundred shares). There are two firms that handle odd lots on the exchange. They are required to buy odd lots when anyone wishes to sell and they have to sell odd lots when anyone wishes to buy. The firms do not deal with the public so they only accept orders from member commission brokers who received orders from customers. The firms charge a price differential on every odd lot trade. Odd-lotters are usually motivated to use the tactic of buying low and selling high. A decrease in the market increases buying and an increase in the market increases selling. An important feature with odd lots is if an investor wants to purchase a large amount of shares, but cannot afford a round lot price. Odd lots can be analyzed similar to round lots.

Short sales include any sale which is carried out by the delivery of a security borrowed for, or for the account of, the seller. Short selling involves the sale of something that the investor does not own. The investor anticipates a fall in its price. There is speculation (a random walk theory discussed later) involved that the stock will decline in price to buy back later at a profit. Short selling is made possible when the broker lends stock to the short seller so that a delivery can be made to the buyer who does not know that the stock is selling short. The sale price is fixed and the cost is a variable. In ordinary trades the sale price is a variable and the cost is fixed. The difference between cost and sale price represents profit. There are special rules involved in short selling.

Sales must be marked "short" when a transaction is made. There is the "uptick" rule where sales may not be made at a price less than one eighth point higher than the last sale price of the stock. Odd lots have a similar restriction.

The 80:20 theory states that eighty percent of portfolios do worse than the stock market average. Only twenty percent do well on average. The 80:20 theory can be applied to stock markets and companies like retail stores. Within a company twenty percent of the merchandise makes up eighty percent of the company's sales. The other eighty percent of the merchandise make up twenty percent of the company's sales. If a hundred dollars is spent, eighty dollars is wasted. Investors need to think about the 80:20 theory in order to determine the risk involved in investing (Jenks 155).

4.4 Random Walk Approach Strategies

The following are random walk strategies. They include the random walk theory, the risks involved in the market, and a few microeconomic ideas like speculation, game theory, and perfect competition. Our simulation will deal with speculation and risks.

4.4.1 Random Walk Theory

The random walk theory does not complement the fundamental and technical approaches. It is the opposite and does not rely on analyzing too much data. With the

fundamental and technical approaches, analyzers study the market and its data to predict trends. With the random walk theory, the market and its data are all random observations. In the stock market, there are no simple tools that will earn an investor a profit. An investor cannot win what he does not earn. If stock prices are fair representations of value then they do not change in a systematic way. They only change if something unexpected happens such as an oil embargo that hurts the economy. Events affect stock prices and since the news is unpredictable, so are the prices of stocks. "Random walk" is the movement without pattern, design, or purpose. There is no memory of the past and the past does not influence the present or future. Thus, the technical systems fail.

Determining the value of stocks cannot be forecasted. In transactions, a seller sells stock he deems to be overvalued while the buyer buys the stock he deems to be undervalued. Either person could be right. The decision to buy and sell is based on what the investor believes in. An investor who buys believes the price of the stock will rise in the future while an investor who sells believes the price of the stock will fall in the future. Prices of stocks are subjective, not objective and thus, they are random. There is no method to predict which stocks are better than others or when these stocks will rise or fall on a particular day, month, year, etc.

There are two tests to determine if stock prices are indeed random: bell shaped appearance of the changes of stock prices and the randomly selected portfolio called dart throwing. The first test examines the changes of stock prices. There are a few that change a little and a few that change a lot. However, most stocks change in the middle. There is a bell shaped curve. The second test analyzes a randomly made portfolio consisting of twenty to twenty-five stocks to see how well they do compared to the stock market. The

portfolio usually performs as well as the market. Followers of the random walk theory believe that making a profit in the stock market is random luck. These followers, called generalists believe there is no formula for success. They proceed gradually and make small, infrequent trades and keep a substantial amount of money. They take losses quickly and do not over diversify. They keep a cash reserve and do not over invest. They know the risks involved when investing (Crowell 35).

4.4.2 Risks

Investors have a concept of value – stock prices reflect what the investors' consensus view as the present value of the anticipated future earnings or dividends from owning a stock. Investors must also have a concept of risk. Risk is the sudden drops in prices or the slow, but steady losses of value which cause investors to wonder whether there is a limit in losing everything. Risk is inherent in all stocks, independent from past records or current records. So why take risks? Generalists believe that an investor needs to earn his profits. There is a higher return associated with a higher risk. Investors need to think about the risks involved when investing. They need to think about how much the price of a stock is likely to fluctuate even though they cannot predict its value. They need to think about how much it is likely to move in either direction because as fast as a stock price rises, it can easily plummet at the same rate. To get an idea on how the price of a stock can fluctuate, an estimate can be made using the range formula and standard deviation:

$$\text{Range} = 100\% \times 2 \frac{\text{High price of stock} - \text{Low price of stock}}{\text{High price of stock} + \text{Low price of stock}}$$

The lower the range, the lower the risk. The standard deviation shows the dispersion of the range and shows the risk involved with the distribution (Crowell 78).

4.4.3 Microeconomic Ideas

The random walk approach also uses microeconomic ideas including speculation, game theory, and perfect competition. With speculation, there is a risk involved when investing. The investor who buys believes that a stock will rise in price soon. They sell when they believe the price will fall. Even though they believe the prices are random, they think the price fluctuations will be profitable and so they take a risk to earn a reward. Speculation is used mainly in low priced stocks that do not exceed twenty dollars per share. These stocks attract round lot buyers who cannot afford higher prices. Those who work with speculation believe the prices will rise soon or fall soon.

Game theory also represents the random walk theory. Game theory states that each phenomenon is independent and not influenced by the past. For example, flipping a coin is similar to the stock market and its prices. A coin has no memory of its past flips. The chance for flipping heads or tails is still 50/50, even if the past thousand flips landed on heads. The stock market with its prices does not remember its past. Prices will rise or fall differently each day uninfluenced by what happened the previous day.

The stock market represents a perfectly efficient market that will adjust its prices instantaneously when new information is revealed. With perfect competition, there are no surprising profits because other perfect competitors do exactly the same thing. Perfect competition happens when every competitor has a similar product. No one has an advantage over the other and everything is practically equal. New information is used by everyone and no competitor gains an advantage from this information. Perfect competition is similar to the stock market because no investor has an advantage over another since the system is random.

4.5 Stock Selection Methods

Keeping the above strategies in mind, it is now time to pick stocks for the portfolio. There are three types of stocks: value, growth, and hot stocks. Value stocks are stocks that sell at a low price compared to its true value. Keep a lookout for bargains and stocks that are marked down for a quick sale. However, with value stocks there is a danger that it may "look" undervalued, but it is not. The value is based on an opinion and may stay undervalued for a while. Are some value stocks undervalued? If they are, then they are bargain stocks that should be bought. Obtain the stock price, and estimate its earnings per share, dividends per share, book value per share, and estimated future growth rate. Is the price below book value? How does the current price to book value ratio (P/B) compare to the same ratio in previous years? Some stocks tend to trade in a given P/B range of .75 to 1.5 for example. Also find the stock's high and low prices and

P/E in each of the last five years. Using the high and low prices, and earnings per share for each year, is the current P/E high or low based on these statistics? Make a P/E versus Growth Rate chart including several stocks at various levels of growth potential. Draw a fair value line sloping upwards to the right. Does the stock's P/E appear low to this line?

Growth stocks are stocks that increase in earnings per share year after year at an above average rate. They are products and services that have increased sales and have management decisions to develop new products when their other products have gotten old. They have a good profit margin and good labor relations (no strikes). The danger with growth stocks is that they are hard to pick and that some of them just do not grow. Investors refer to these stocks as stocks that "have grown," not stocks that "will grow". With growth stocks, market timing is crucial. An investor needs to know when it is the right time to buy and sell. A good stock to pick would be one that is a low priced growth stock which is a combination of value and growth stock. However, these are very hard to find (Crowell 188).

Hot stocks are favored by investors for one reason or another. They are based on trends and fads. These are picked on speculation.

4.6 Conclusion

This chapter gave important strategies from the three different schools of analysis: fundamental, technical, and random walk as well as stock selection methods. The information in this chapter can help an investor learn which methods can help him in

selecting stocks and analyzing data to know when to buy and sell his stocks. Strategies from the technical approach included Dow's Theory, Moving Average Line, and others. The fundamental approach included the Vertical Line Chart, buy and sell tactics, and others. The random walk approach included the theory, risks, and microeconomic ideas. An investor who has finished reading this chapter and the previous chapters can begin investing.

The next chapter will explain how we will test some of these strategies in a nine week stock market simulation.

Chapter 5:

Simulation

The previous chapter described numerous strategies from three different approaches. This chapter describes a simulation that we performed to test some of those strategies. Before the simulation procedure is given, background information on the companies that we chose for our portfolio is presented. This will help in organizing the company into what stock category it fits into (chapter 3). Following the background information will be investor information which may include earnings and charts from previous periods. Third quarter, fourth quarter, or annual reports may also be given. This information will be valuable in implementing certain strategies as well as getting a good estimate on the risks involved with each company. We will then explain why we chose these companies. The stock market simulation procedure that we used will follow the company information. This includes buy and sell transactions and the strategies we used for the simulation.

5.1 Company Information

The following subsections describe each company and its investor relations. This will include information about the company: a brief history, what type of company it is and what services it provides. Investor relations include a stock chart containing prices of

the previous 52 weeks, and may include third quarter, fourth quarter, or annual reports, and important indicators. We will then explain why we chose these companies.

Our simulation began in the middle of November. We researched and analyzed data before our simulation began (October and early November). We looked at stock charts and graphs for each company to see whether the stock prices were on an uptrend or downtrend and for how long it was on that trend. We then looked at financial information from third or fourth quarter reports depending on when the reports were distributed. We also looked at annual reports if they were available. We looked to see if the company increased in profits, assets, earnings per share, etc. as indicators of success. We also looked at liabilities as an indicator of a possible plummet in prices. Stock charts and graphs and financial data are given for most of the companies.

5.1.1 Wal-Mart (WMT)

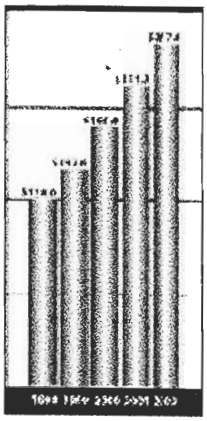
Wal-Mart Stores, Inc. is a company chain of discount retail stores. In 1962, the company was founded by Sam and Bud Walton in Rogers, Arkansas. The company produces goods in two divisions: retail and specialty. The retail division includes the Wal-Mart stores and super centers that include grocery stores, Sam's Clubs – a members-only warehouse club, the international market, and an online store – www.walmart.com. The specialty division includes Tire & Lube Express – an automotive service, a

pharmacy, and an auction site. Wal-Mart was built on three basic beliefs: to respect the individual, to service its customers, and to strive for excellence.

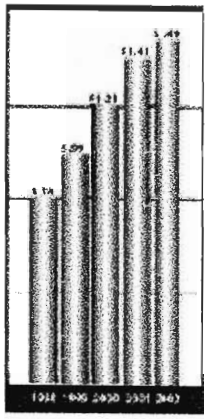
From the annual report, Wal-Mart's earnings per share and net sales have grown over the years. This is a good sign that Wal-Mart will continue to grow in sales. However, the returns on assets and equity for shareholders have dropped, but they are still strong. The following shows the graphs while next three pages show financial information from the last three years.

Fig. 5.1 Wal-Mart Stock Prices and Volume (Past Year)

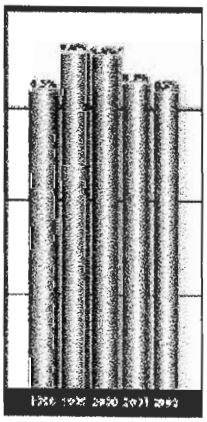
NET SALES



EARNINGS PER SHARE



RETURN ON ASSETS



RETURN ON EQUITY

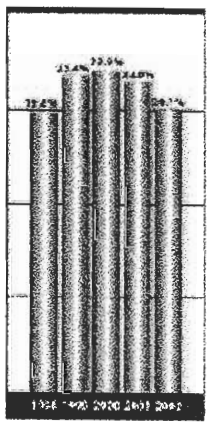


Fig. 5.2 Wal-Mart Graphs: Net Sales, EPS, Return on Assets, Return on Equity

Table 5.1 Wal-Mart Financial Summary (Past 3 Years)

Financial Summary

(Dollar amounts in millions except per share data)	2002	2001	2000
Net sales	$ 217,799	$ 191,329	$ 165,013
Net sales increase	14%	16%	20%
Domestic comparative store sales increase	6%	5%	8%
Other income-net	2,013	1,966	1,796
Cost of sales	171,562	150,255	129,664
Operating, selling and general and administrative expenses	36,173	31,550	27,040
Interest costs:			
Debt	1,052	1,095	756
Capital leases	274	279	266
Provision for income taxes	3,897	3,692	3,338
Minority interest and equity in unconsolidated subsidiaries	(183)	(129)	(170)
Cumulative effect of accounting change, net of tax	–	–	(198)
Net income	6,671	6,295	5,377
Per share of common stock:			
Basic net income	1.49	1.41	1.21
Diluted net income	1.49	1.40	1.20
Dividends	0.28	0.24	0.20
Financial Position			
Current assets	$ 28,246	$ 26,555	$ 24,356
Inventories at replacement cost	22,749	21,644	20,171
Less LIFO reserve	135	202	378
Inventories at LIFO cost	22,614	21,442	19,793
Net property, plant and equipment and capital leases	45,750	40,934	35,969
Total assets	83,451	78,130	70,349
Current liabilities	27,282	28,949	25,803
Long-term debt	15,687	12,501	13,672
Long-term obligations under capital leases	3,045	3,154	3,002
Shareholders' equity	35,102	31,343	25,834
Financial Ratios			
Current ratio	1.0	0.9	0.9
Inventories/working capital	23.5	(9.0)	(13.7)
Return on assets*	8.5%	8.7%	9.5%***
Return on shareholders' equity**	20.1%	22.0%	22.9%
Other Year-End Data			
Number of U.S. Wal-Mart stores	1,647	1,736	1,801
Number of U.S. Supercenters	1,066	888	721
Number of U.S. SAM'S CLUBS	500	475	463
Number of U.S. Neighborhood Markets	31	19	7
International units	1,170	1,071	1,004
Number of Associates	1,383,000	1,244,000	1,140,000
Number of Shareholders of record (as of March 31)	324,000	317,000	307,000

****Net income before minority interest, equity in unconsolidated subsidiaries and cumulative effect of accounting*
****change/average assets*
****Net income/average shareholders' equity*
****Calculated giving effect to the amount by which a lawsuit settlement exceeded established reserves.*
****If this settlement were not considered, the return would have been 9.8%.*

The net sales increased from previous years. This is a good indicator that Wal-Mart would continue its strong performance in sales. Since our simulation began before Thanksgiving, we speculated that Wal-Mart stores would make excellent sales during the Day-After-Thanksgiving Sale just like in 2001. We also believe its earnings per share would continue to increase.

We were, however, aware of the risks involved with Wal-Mart. Its return on assets and return on equity were on a downtrend, but we did not believe the returns would fall below the returns of 1998. Wal-Mart was in debt and in the end of 2001; it owed more than one billion dollars. Debt can slow a company's earnings and management. And a large debt may indicate problems with sales. However, since our simulation was short term, we believed the debt would not significantly affect the company during the holiday season. We also noticed that previous months' stock prices were on an uptrend that seemed to have lost its peak in the beginning of November. We believed that, according to Dow's Theory, that this was just a secondary trend that countered the primary uptrend.

We were confident that Wal-Mart would increase its sales during the holiday season. Its sales have increased previous years and its earnings per share have increased. We took the risks into account, but we basically ignored them because of our high hopes in the sales speculation.

5.1.2 Amazon.com (AMZN)

Amazon.com is an online retail store. It is similar to Wal-Mart. The company was founded in 1994 by Jeff Bezos, but did not publicly open its online store until May 1997. Amazon.com started selling only books, but expanded its inventory to include electronic goods including movies, music, and hi-tech gadgets. Amazon.com teamed up with Toys R Us stores, Target stores, and other stores to further expand its inventory. Amazon.com now sells merchandise that can be found at most retail stores including video games and toys. It also offers movie show times, gift certificates, and auction sites.

We believe Amazon.com has certain advantages over Wal-Mart in retail. Amazon.com is competitive in its prices usually offering at least 10% off book prices as well as having similar prices to Wal-Mart with other products. Amazon.com ships products straight to consumers' doors. It offers free shipping on purchases over twenty-five dollars and there are no sales taxes if a consumer lives outside North Dakota and Washington. Amazon.com's inventory has increased from the previous year. This is a good sign that they have expanded and are offering a variety of goods. Its net sales have increased as well. With the holiday season approaching in our simulation, we believe Amazon.com would profit from the sales.

However, Amazon.com has some risks. It has a large debt at the end of the third quarter 2002 (2.2 billion dollars). But like Wal-Mart we believe the short term simulation and the holiday season will make the debt insignificant. Also its total assets have

decreased from the previous year, but being a small decrease, we believe the company can turn the decrease around. By looking at the graph of the past year's stock prices, the company has been on an uptrend since August. We do not know whether this is the peak of the uptrend or the middle of it. We will take a chance and invest in Amazon.com in hopes of the uptrend to be in the middle stages.

Fig. 5.3 Amazon.com Stock Prices and Volume (Past Year)

Table 5.2 Amazon.com Financial Summary (Past 2 Years)

PART I. FINANCIAL INFORMATION

Item 1. ***Financial Statements***

AMAZON.COM, INC.

CONSOLIDATED BALANCE SHEETS
(in thousands, except per share data)
(Unaudited)

	September 30, 2002	December 31, 2001
ASSETS		
Current assets:		
Cash and cash equivalents	$ 327,564	$ 540,282
Marketable securities	538,238	456,303
Inventories	151,514	143,722
Prepaid expenses and other current assets	102,291	67,613
Total current assets	1,119,607	1,207,920
Fixed assets, net	239,238	271,751
Goodwill, net	70,811	45,367
Other intangibles, net	4,373	34,382
Investments in equity-method investees	1,136	10,387
Other equity investments	15,362	17,972
Other assets	46,878	49,768
Total assets	$ 1,497,405	$ 1,637,547
LIABILITIES AND STOCKHOLDERS' DEFICIT		
Current liabilities:		
Accounts payable	$ 347,519	$ 444,748
Accrued expenses and other current liabilities	241,674	305,064
Unearned revenue	65,878	87,978
Interest payable	42,793	68,632
Current portion of long-term debt and other	13,134	14,992
Total current liabilities	710,998	921,414
Long-term debt and other	2,264,846	2,156,133
Commitments and contingencies		
Stockholders' deficit:		
Preferred stock, $0.01 par value:		
Authorized shares—500,000		
Issued and outstanding shares—none	—	—
Common stock, $0.01 par value:		
Authorized shares—5,000,000		
Issued and outstanding shares—381,216 and 373,218 shares, respectively	3,812	3,732
Additional paid-in capital	1,550,118	1,462,769
Deferred stock-based compensation	(7,775)	(9,853)
Accumulated other comprehensive loss	(12,233)	(36,070)
Accumulated deficit	(3,012,361)	(2,860,578)
Total stockholders' deficit	(1,478,439)	(1,440,000)
Total liabilities and stockholders' deficit	$ 1,497,405	$ 1,637,547

Table 5.3 Amazon.com Financial Summary II (Past 2 Years)

AMAZON.COM, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share data)
(Unaudited)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2002	2001	2002	2001
Net sales	$851,299	$ 639,281	$2,504,326	$2,007,262
Cost of sales	635,132	477,089	1,846,867	1,482,753
Gross profit	216,167	162,192	657,459	524,509
Operating expenses:				
Fulfillment	90,342	81,400	265,908	265,231
Marketing	26,728	32,537	87,804	103,833
Technology and content	52,907	53,846	166,569	188,840
General and administrative	18,698	21,481	59,034	70,287
Stock-based compensation (1)	(832)	(2,567)	33,247	2,700
Amortization of goodwill and other intangibles	1,212	41,835	4,565	143,496
Restructuring-related and other	36,757	3,994	46,731	176,904
Total operating expenses	225,812	232,526	663,858	951,291
Loss from operations	(9,645)	(70,334)	(6,399)	(426,782)
Interest income	5,600	6,316	16,902	23,073
Interest expense	(35,922)	(35,046)	(106,817)	(103,942)
Other income (expense), net	3,183	(2,203)	2,876	(7,265)
Other gains (losses), net	2,261	(63,625)	(55,677)	(18,453)
Total non-operating expenses, net	(24,878)	(94,558)	(142,716)	(106,587)
Loss before equity in losses of equity-method investees	(34,523)	(164,892)	(149,115)	(533,369)
Equity in losses of equity-method investees, net	(557)	(4,982)	(3,469)	(28,472)
Loss before change in accounting principle	(35,080)	(169,874)	(152,584)	(561,841)
Cumulative effect of change in accounting principle	—	—	801	(10,523)
Net loss	$ (35,080)	$(169,874)	$ (151,783)	$ (572,364)
Basic and diluted loss per share:				
Prior to cumulative effect of change in accounting principle	$ (0.09)	$ (0.46)	$ (0.41)	$ (1.55)
Cumulative effect of change in accounting principle	—	—	0.01	(0.03)
	$ (0.09)	$ (0.46)	$ (0.40)	$ (1.58)
Shares used in computation of loss per share:				
Basic and diluted	379,650	368,052	376,564	361,782
(1) Components of stock-based compensation:				
Fulfillment	$ (98)	$ (575)	$ 5,512	$ 206
Marketing	115	(110)	2,419	370
Technology and content	(765)	(948)	17,305	1,708
General and administrative	(84)	(934)	8,011	416
	$ (832)	$ (2,567)	$ 33,247	$ 2,700

5.1.3 Target (TGT)

Target, like Wal-Mart, is a company chain of retail stores. The first store opened in Roseville, Minnesota in 1962. It was the first retail store to offer national brands at discounted prices. Target's goals include producing the best products, selling them at the best prices, and giving to the communities that it does its business in. Target strives for an energetic and friendly team to maintain its goals. Target has recently teamed up with Amazon.com, Marshall Field's, and Mervyn's to sell its goods online through www.target.com.

According to its third quarter report, Target's earnings per share increased from $0.25 the previous year to $0.30 by November. Its sales and assets have increased. In the beginning of October, Target was still on a downtrend and since we had two stores in our portfolio, we decided not to buy Target until at a later time.

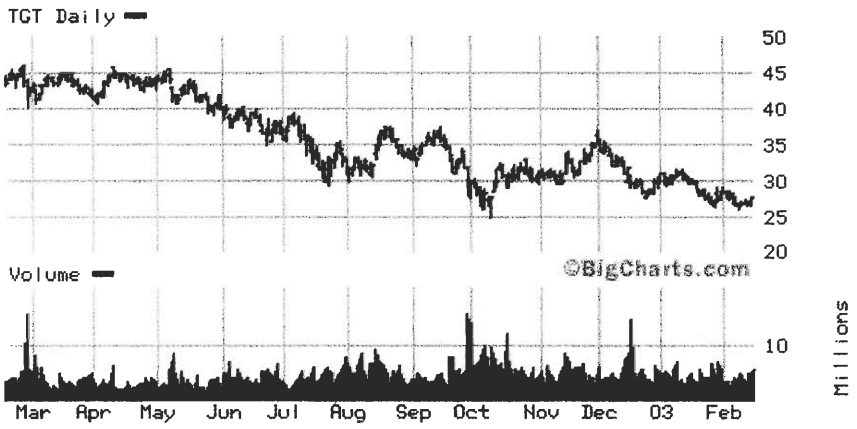


Fig. 5.4 Target Stock Prices and Volume (Past Year)

Table 5.4 Target Financial Summary (Past 2 Years)

TARGET CORPORATION
CONSOLIDATED RESULTS OF OPERATIONS

(Millions, except per share data) (Unaudited)	Three Months Ended Nov. 2, 2002	Nov. 3, 2001	% Change	Nine Months Ended Nov. 2, 2002	Nov. 3, 2001	% Change
Sales	$9,884	$9,148	8.0%	$29,011	$26,129	11.0%
Net credit revenues	310	183	70.3	845	477	77.2
Total revenues	10,194	9,331	9.3	29,856	26,606	12.2
Cost of sales	6,736	6,337	6.3	19,698	18,022	9.3
Selling, general and administrative expense	2,364	2,143	10.3	6,740	6,004	12.3
Credit expense	196	150	30.5	532	300	77.3
Depreciation and amortization	305	281	8.5	889	796	11.7
Interest expense	145	122	18.0	434	338	27.9
Earnings before income taxes	448	298	51.0	1,563	1,146	36.6
Provision for income taxes	171	113	52.4	597	436	37.3
Net earnings	$277	$185	50.2%	$966	$710	36.1%
Basic earnings per share	$0.31	$0.20	49.2%	$1.06	$0.79	35.1%
Diluted earnings per share	$0.30	$0.20	49.3%	$1.06	$0.78	35.3%
Weighted average common shares outstanding:						
Basic	908.5	902.3		907.6	900.7	
Diluted	914.0	908.3		913.9	908.5	

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION

(Millions) (Unaudited)	November 2, 2002	November 3, 2001
ASSETS		
Cash and cash equivalents	$834	$424
Accounts receivable, net	4,882	2,709
Inventory	5,612	5,780
Other	1,147	959
Total current assets	12,475	9,872

Property and equipment, net	14,878	13,077
Other	1,322	913
Total assets	$28,675	$23,862
LIABILITIES AND SHAREHOLDERS' INVESTMENT		
Accounts payable	$4,927	$4,451
Current portion of long-term debt and notes payable	1,374	717
Other	1,836	1,770
Total current liabilities	8,137	6,938
Long-term debt	10,559	8,711
Other	1,223	1,055
Shareholders' investment	8,756	7,158
Total liabilities and shareholders' investment	$28,675	$23,862
Common shares outstanding	908.8	902.8

5.1.4 Best Buy (BBY)

Best Buy Co., Inc. is one of the largest retail store chains that specialize in consumer electronics, personal computers, entertainment software, and appliances. Best Buy offers a variety of products that are affordable including easy to use technology and entertainment. It is also committed to community involvement and believes in education for children. The company also sells products through its website www.bestbuy.com. It offers free shipping on every product. The website can also be located through Media Play, Sam Goody, Suncoast, and other names.

Best Buy's stock prices were on a down trend at the start of our simulation. Its liabilities and shareholder's equity increased in the past year. By analyzing the graphs on the next pages, Best Buy increased profits, revenue, income, inventory, and earnings per share. It decreased in common equity. Although these were good signs that Best Buy's stock was increasing in value, we chose not to invest in Best Buy at the beginning of our

simulation because of the downtrend in the beginning of November and for similar reasons that we did not choose Target, we already had two retail chains in our portfolio.

Table 5.5 Best Buy Financial Summary (Past 4 Years)

$ in millions, except per share amounts

Fiscal Year[1]	2002[2]	2001[2]	2000	1999
Statement of Earnings Data				
Revenues	$ 19,597	$ 15,327	$12,494	$10,065
Gross profit	4,430	3,059	2,393	1,815
Selling, general and administrative expenses	3,493	2,455	1,854	1,464
Operating income	937	604	539	351
Net earnings (loss)	570	396	347	216
Per Share Data[3]				
Net earnings (loss)	$ 1.77	$ 1.24	$ 1.09	$ .69
Common stock price: High	51.47	59.25	53.67	32.67
Low	22.42	14.00	27.00	9.83
Operating Statistics				
Comparable store sales change[4]	1.9%	4.9%	11.1%	13.5%
Inventory turns[5]	7.5	7.6	7.2	6.6
Gross profit percentage	22.6%	20.0%	19.2%	18.0%
Selling, general and administrative expense percentage	17.8%	16.0%	14.8%	14.5%
Operating income percentage	4.8%	3.9%	4.3%	3.5%
Average revenues per store[6]	$ 38	$ 39	$ 37	$ 34
Year-End Data				
Working capital	$ 881	$ 214	$ 453	$ 662
Total assets	7,375	4,840	2,995	2,532
Long-term debt, including current portion	820	296	31	61
Convertible preferred securities	—	—	—	—
Shareholders' equity	2,521	1,822	1,096	1,034
Number of stores				
Best Buy	481	419	357	311
Magnolia Hi-Fi	13	13	—	—
Musicland	1,321	1,309	—	—
International	95	—	—	—
Total retail square footage (000s)				
Best Buy	21,599	19,010	16,205	14,017
Magnolia Hi-Fi	133	133	—	—
Musicland	8,606	8,772	—	—
International	1,923	—	—	—

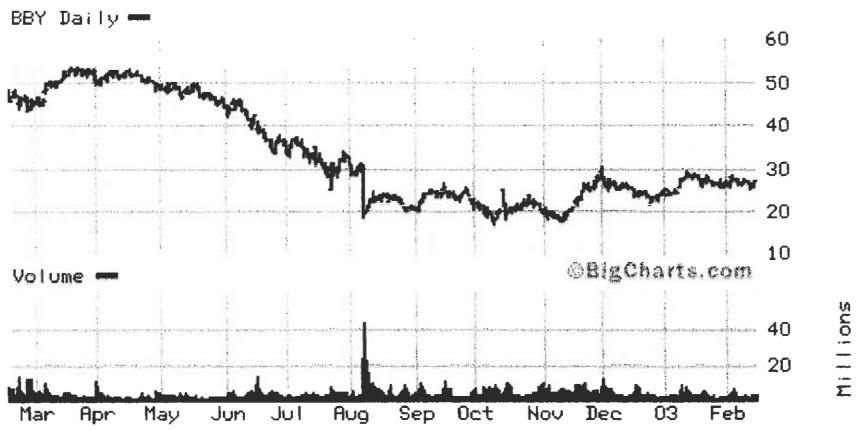
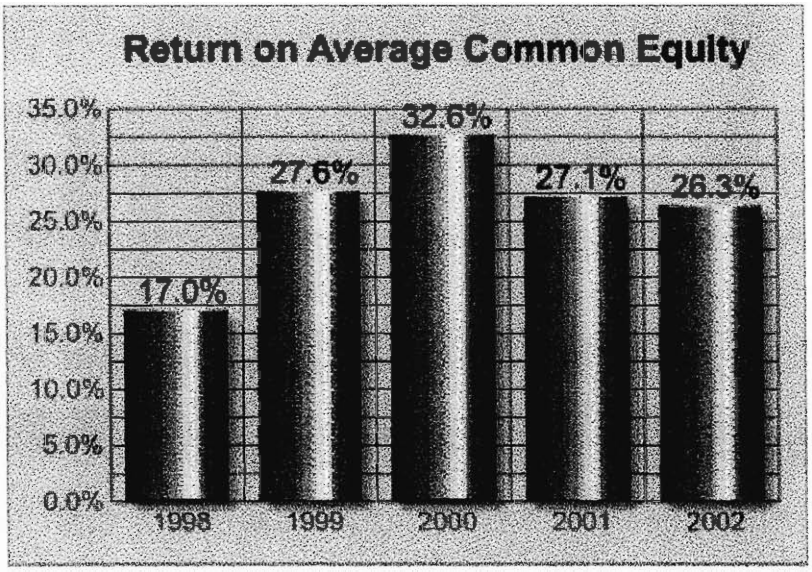
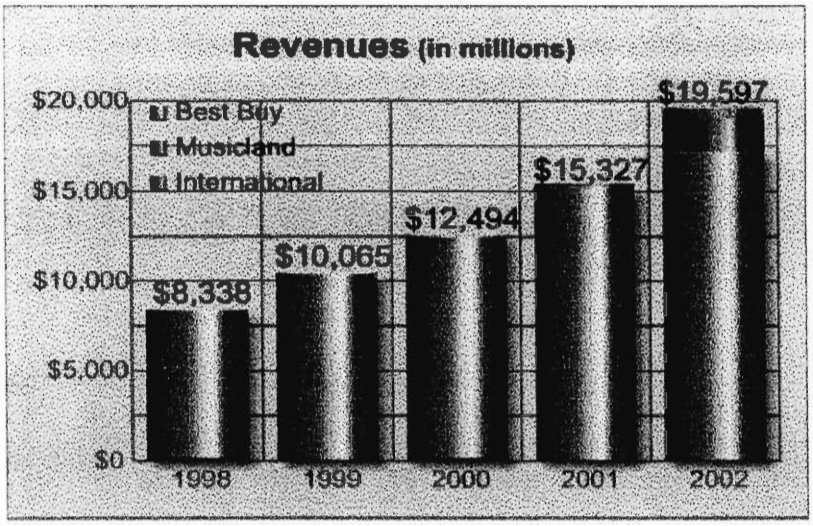


Fig. 5.5 Best Buy Stock Prices and Volume (Past Year)



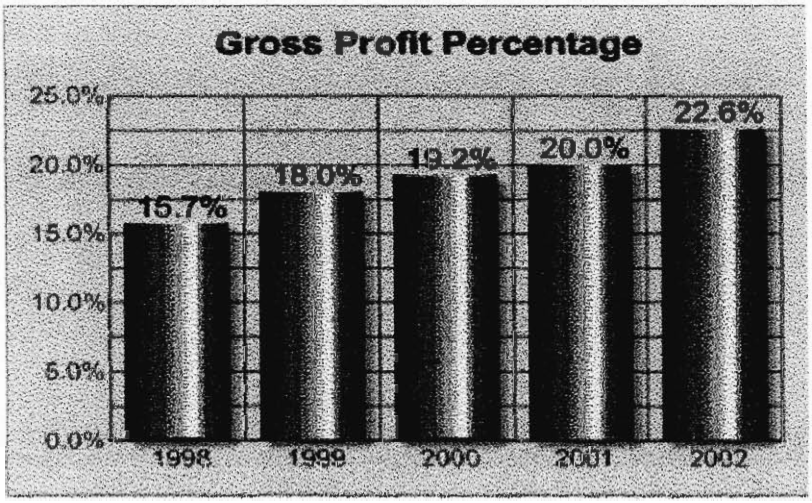
Our return on equity compares favorably with that of other national retailers.

Fig. 5.6 Best Buy Return on Equity



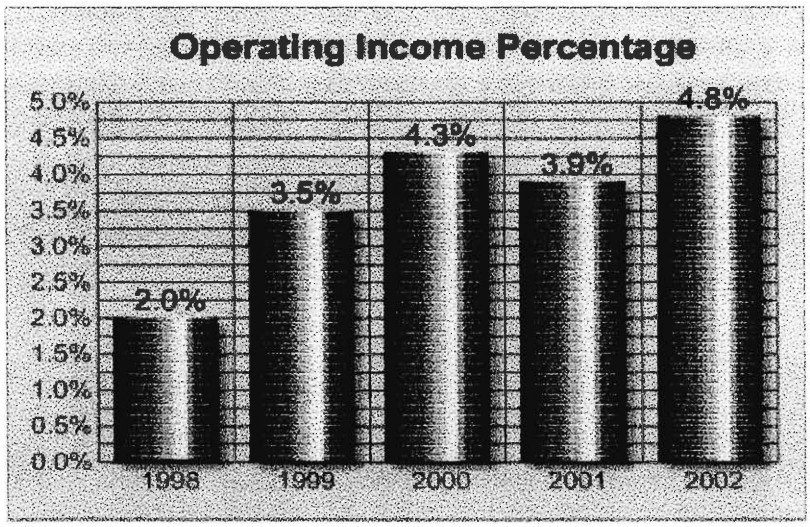
We have grown revenues by an average rate of 20 percent per year through new stores, sales increases at existing stores and acquisitions.

Fig. 5.7 Best Buy Revenues



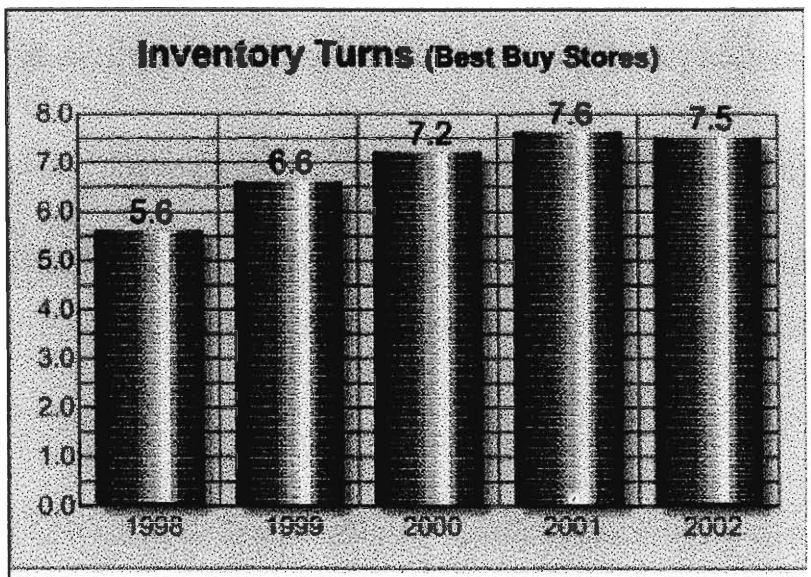
Our 2002 gross profit percentage improvement reflects our Musicland acquisition, a richer product mix, fewer markdowns and lower consumer financing costs.

Fig. 5.8 Best Buy Profit



Our operating income rate has increased by 2.8 percent of sales, reflecting improvements in our gross margin.

Fig. 5.9 Best Buy Income



Inventory management remains a stregth of the company. We held inventory turns steady in fiscal 2002 despite soft sales of high-turning desktop computers.

Fig. 5.10 Best Buy Inventory

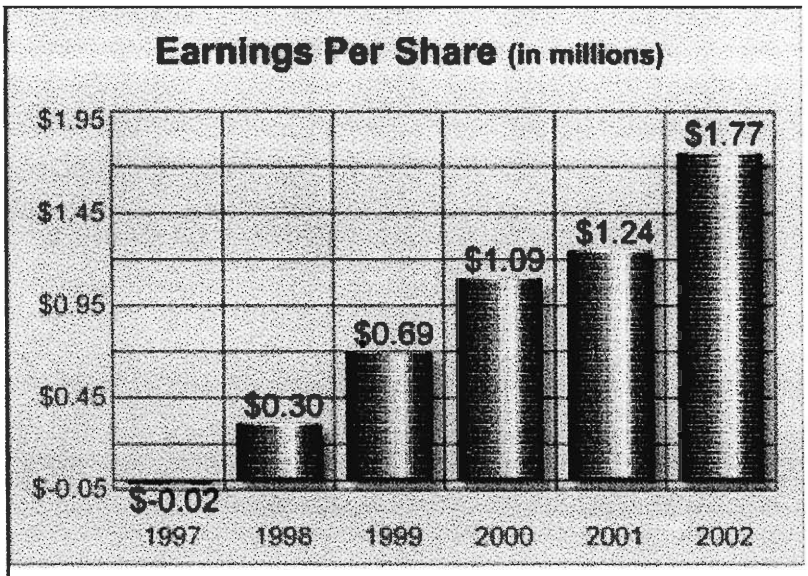


Fig. 5.11 Best Buy EPS

5.1.5 Verizon (VZ)

Verizon Communications offers various products in communication. It was formed by the merger of Bell Atlantic and GTE. Verizon is one of the largest providers of wireline and wireless communications in the United States, with over 136 million access line equivalents and over 32 million wireless customers. It offers products in wireless technology including cellular phone services. It is a telephone provider for long distance and local services and a provider for broadband internet access. It is also the world's largest provider of print and online directory information. It is a Fortune 10 company

with more than 229,000 employees and 67 billion dollars in 2002 revenues. Verizon's global presence extends to 33 countries in the world.

Verizon has expanded its communications products the past few years. With its recent advertisement that it can provide its customers services in wireless, long distance, and internet communication in one package, we believe that many customers would deal with Verizon based on convenience. Although its total assets have decreased the past year and its debt is high, we believe Verizon can increase its sales during the holiday season as more people are using cellular phones and internet these days. The past year, Verizon has been on a downtrend that reached its lowest points from July to October. Now, it is on an uptrend. We hope it is not the end of the uptrend.

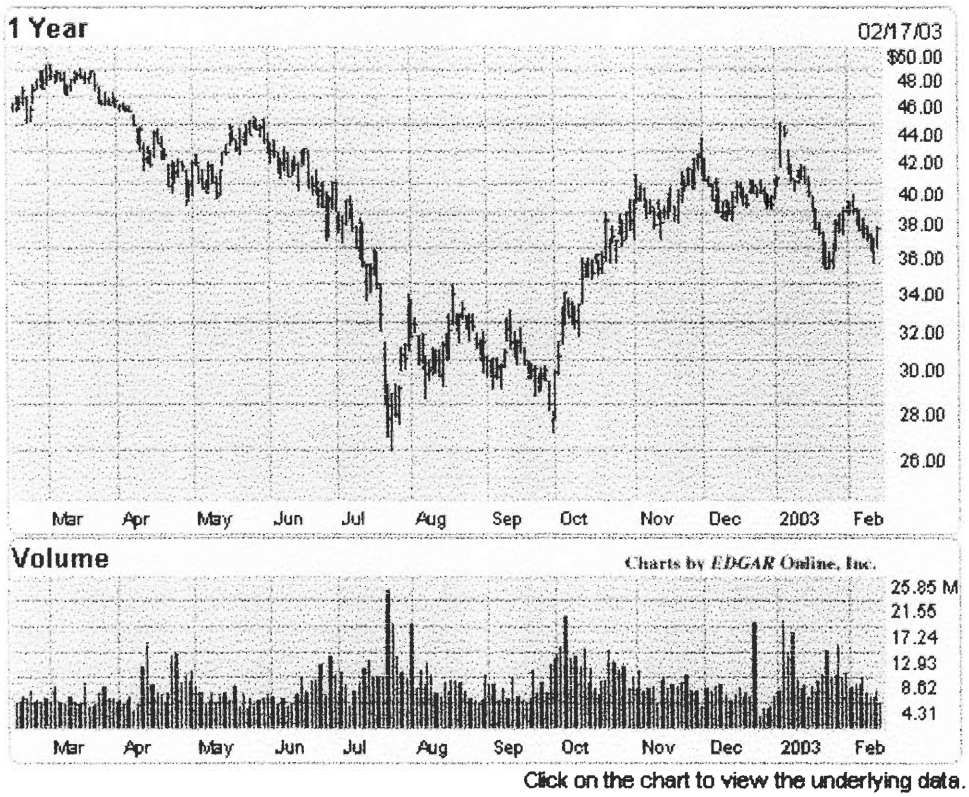


Fig. 5.12 Verizon Stock Prices and Volume (Past Year)

Table 5.6 Verizon Financial Summary (Past 2 Years)

VERIZON COMMUNICATIONS INC. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

(dollars in millions)

Unaudited	9/30/02	12/31/01	$ Change
Assets			
Current assets			
Cash and cash equivalents	$ 5,651	$ 979	$ 4,672
Short-term investments	246	1,991	(1,745)
Accounts receivable, net	12,956	14,254	(1,298)
Inventories	1,612	1,968	(356)
Net assets held for sale	—	1,199	(1,199)
Prepaid expenses and other	3,001	2,796	205
Total current assets	23,466	23,187	279
Plant, property and equipment	176,779	169,586	7,193
Less accumulated depreciation	102,642	95,167	7,475
	74,137	74,419	(282)
Investments in unconsolidated businesses	4,950	10,202	(5,252)
Intangible assets	46,761	44,262	2,499
Other assets	19,785	18,725	1,060
Total Assets	$ 169,099	$ 170,795	$ (1,696)
Liabilities and Shareowners' Investment			
Current liabilities			
Debt maturing within one year	$ 11,422	$ 18,669	$ (7,247)
Accounts payable and accrued liabilities	14,242	13,947	295
Other	5,320	5,404	(84)
Total current liabilities	30,984	38,020	(7,036)
Long-term debt	46,029	45,657	372
Employee benefit obligations	13,648	11,898	1,750
Deferred income taxes	18,802	16,543	2,259
Other liabilities	3,951	3,989	(38)
Minority interest	23,840	22,149	1,691
Shareowners' investment			
Common stock	275	275	—
Contributed capital	24,671	24,676	(5)
Reinvested earnings	9,223	10,704	(1,481)
Accumulated other comprehensive loss	(1,336)	(1,187)	(149)
	32,833	34,468	(1,635)
Less common stock in treasury, at cost	402	1,182	(780)
Less deferred compensation – employee stock ownership plans and other	586	747	(161)
Total shareowners' investment	31,845	32,539	(694)
Total Liabilities and Shareowners' Investment	$ 169,099	$ 170,795	$ (1,696)

5.1.6 AT&T Wireless (AWE)

AT&T Wireless offers services in wireless communications. In July 2001, the company split from AT&T to become one of the largest independently owned and operated wireless companies in North America. The company serves over 20.8 million subscribers by providing a variety of features of cost-effective wireless communications including voice, data, internet, and text services through mlife.

AT&T Wireless has grown in a short period. Its total assets have increased from the previous year. Shareholder's equity has also increased. And its debt has decreased. The company shows some excellent indicators. The graph shows the stock prices have been in an uptrend since October. We hope it will continue during the simulation. We believe that, like Verizon, AT&T will increase in sales during the holiday season.

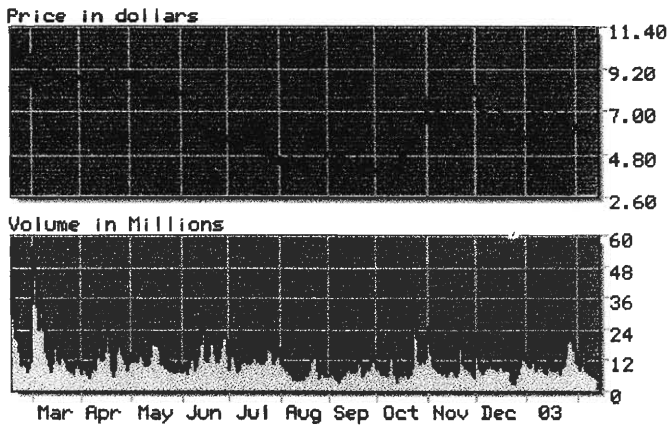


Fig. 5.13 AT&T Wireless Stock Prices and Volume (Past Year)

Table 5.7 AT&T Wireless Financial Summary (Past 2 Years)

Appendix I: Balance Sheets

AT&T Wireless Services, Inc. and Subsidiaries
Consolidated Condensed Balance Sheets
In millions, except per share amounts - Unaudited

	September 30, 2002	December 31, 2001	Change
ASSETS			
Cash and cash equivalents	$ 3,751	$ 3,352	11.9%
Accounts receivable, less allowances of $275 and $239	2,194	2,026	8.3%
Inventories	210	307	(31.6%)
Income tax receivable	44	210	(79.1%)
Deferred income taxes	-	222	n/m
Prepaid expenses and other current assets	305	180	69.0%
TOTAL CURRENT ASSETS	6,504	6,297	3.3%
Property, plant and equipment, net of accumulated depreciation of $6,784 and $5,232	14,329	12,496	14.7%
Licensing costs	13,994	13,100	6.8%
Investments in and advances to unconsolidated subsidiaries	2,411	3,672	(34.3%)
Goodwill	7,177	4,712	52.3%
Other assets, net of accumulated amortization of $729 and $493	1,369	1,357	0.9%
Assets of discontinued operations	-	88	n/m
TOTAL ASSETS	$ 45,784	$ 41,722	9.7%
LIABILITIES			
Accounts payable	$ 754	$ 1,035	(27.2%)
Payroll and benefit-related liabilities	427	409	4.4%
Due on demand notes payable	-	88	n/m
Other current liabilities	1,927	1,900	1.5%
TOTAL CURRENT LIABILITIES	3,108	3,432	(9.4%)
Long-term debt due to others	11,033	6,617	66.7%
Deferred income taxes	3,667	4,352	(15.7%)
Other long-term liabilities	287	330	(13.1%)
TOTAL LIABILITIES	18,095	14,731	22.8%
MINORITY INTEREST	51	46	11.3%
MANDATORILY REDEEMABLE PREFERRED STOCK (.233 shares issued and outstanding)	146	-	n/m
MANDATORILY REDEEMABLE COMMON STOCK ($0.01 par value, 406 shares issued and outstanding)	7,664	7,664	-
SHAREHOLDERS' EQUITY			
Common stock ($0.01 par value, 2,302 and 2,125 shares issued and outstanding)	23	21	8.3%
Additional paid-in capital	23,204	20,515	13.1%
Accumulated deficit	(3,343)	(1,150)	190.6%
Accumulated other comprehensive loss	(56)	(105)	(47.0%)
TOTAL SHAREHOLDERS' EQUITY	19,828	19,281	2.8%
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	$ 45,784	$ 41,722	9.7%

October 23, 2002

5.1.7 Dell (DELL)

Dell is one of the world's leading computer systems companies. In 1984, Michael Dell founded the Dell Computer Corporation. He believed that by selling computers directly to customers, the company could best understand the customers' needs. The company can then efficiently provide the best computing solutions to meet those needs. The company designs, builds, and customizes its products and services and ships them directly to the consumer. The company builds every system according to each customer's demands. Dell uses the latest technology in its products and manufactures affordable computers to consumers. Dell became a leader in computers by persistent focus on delivering the best customer service.

Dell's sales have increased from the previous year. Its inventory, assets, cash, equity, and debt have all increased. However, its stock chart is on a downtrend after an uptrend reached its peak in early November. We just hope it is only a secondary movement and that it returns to an uptrend.

Table 5.8 Dell Financial Summary (Past 2 Years)

Condensed Consolidated Statement of Financial Position and Related Financial Highlights
(in millions, except for "Ratios" and "Other Information")
(unaudited)

	November 1, 2002	August 2, 2002	November 2, 2001[2]
Assets:			
Current assets:			
Cash and cash equivalents	$4,034	$3,725	$3,442
Short term investments	270	319	309
Accounts receivable, net	2,661	2,590	2,303
Inventories, net	307	291	269
Other	1,483	1,358	1,377
Total current assets	8,755	8,283	7,700
Property, plant and equipment, net	882	872	806
Investments	4,755	4,589	4,267
Other non-current assets	320	318	514
Total assets	$14,712	$14,062	$13,287
Liabilities and Stockholders' Equity:			
Current liabilities:			
Accounts payable	$5,936	$5,621	$4,771
Accrued and other	2,562	2,424	2,446
Total current liabilities	8,498	8,045	7,217
Long term debt	514	516	518
Other	1,052	935	770
Total liabilities	10,064	9,496	8,505
Stockholders' equity	4,648	4,566	4,782
Total liabilities and stockholders' equity	$14,712	$14,062	$13,287
Ratios:			
Quick ratio	0.82	0.82	0.84
Days supply in inventory	4	4	4
Days of sales in accounts receivable[1]	30	32	32
Days in accounts payable	71	73	70
Other information:			
Headcount (approximate)	38,200	36,000	34,400
Average total revenue/unit (approximate)	$1,710	$1,770	$1,800

Note: Ratios are calculated based on underlying data in thousands.

[1]Days of sales in accounts receivable include the effect of in-transit customer shipments recorded in other current assets for all periods presented in the consolidated statement of financial position.

[2]The November 2, 2001 amounts have been reclassified to conform to the November 1, 2002 and August 2, 2002 presentation.

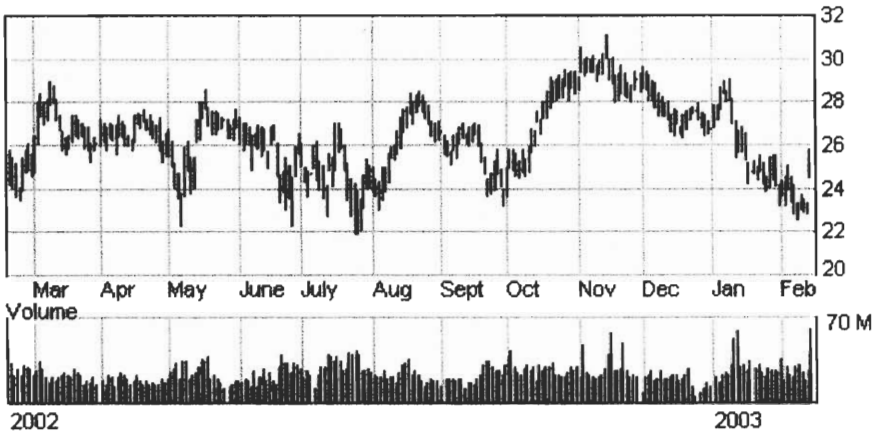


Fig. 5.14 Dell Stock Prices and Volume (Past Year)

5.1.8 Hewlett Packard (HP)

Hewlett Packard is a leading provider of technological products that include computers, printers, and digital cameras. The company was founded in 1939 by Bill Hewlett and Dave Packard. Hewlett Packard offers to expand the information technology infrastructure, personal computing and access devices, global services, and imaging and printing. It provides the invention of products, solutions, and other technologies to better serve customers. Hewlett Packard merged with Compaq Computer Corporation in May 2002. HP now operates in over 160 countries. HP is organized into four groups: Enterprise Systems Group (ESG) which focuses on IT infrastructure, Imaging and

Printing Group (IPG) which provides digital imaging and printing products like scanners and cameras, HP Services (HPS) which provide global IT services, and Personal Systems Group (PSG) which provide personal computers for homes and businesses. In addition, new technological inventions are created at HP Labs.

Hewlett Packard's assets have doubled the past year. However, its debt has also doubled. Its equity has nearly tripled. Its graph the past year shows a downtrend ending in October while an uptrend beginning. We hope this uptrend continues throughout the simulation.

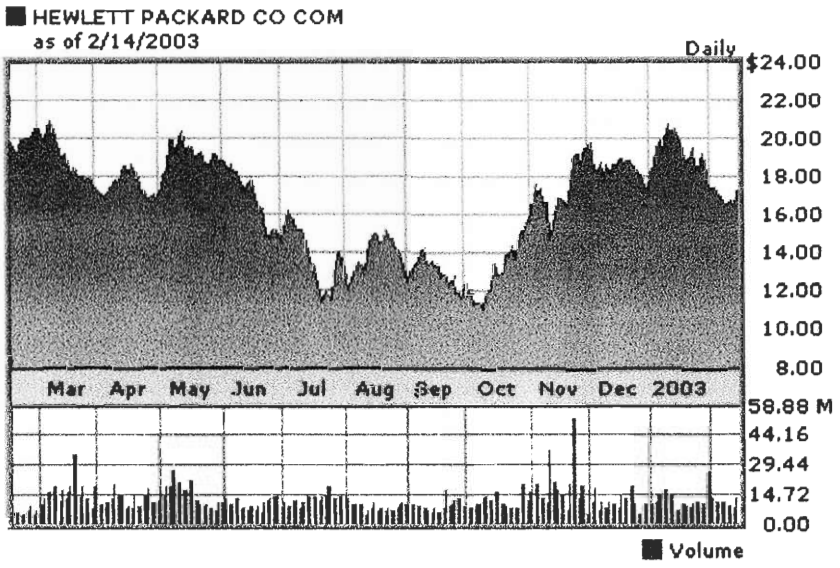


Fig. 5.15 Hewlett Packard Stock Prices and Volume (Past Year)

Table 5.9 Hewlett Packard Financial Summary (Past 2 Years)

Nov. 20, 2002

HEWLETT-PACKARD COMPANY AND SUBSIDIARIES
CONSOLIDATED CONDENSED BALANCE SHEET
(In millions)

	October 31, 2002 (unaudited)	October 31, 2001 (a)
ASSETS		
Current assets:		
Cash and cash equivalents	$ 11,192	$ 4,197
Short-term investments	237	139
Accounts receivable, net	8,456	4,488
Financing receivables, net	3,453	2,183
Inventory	5,797	5,204
Other current assets	6,940	5,094
Total current assets	36,075	21,305
Property, plant and equipment, net	6,924	4,397
Long-term investments and other assets	7,760	6,126
Goodwill and other purchased intangible Assets, net	19,951	756
Total assets	$ 70,710	$ 32,584
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Notes payable and short-term borrowings	$ 1,793	$ 1,722
Accounts payable	7,012	3,791
Employee compensation and benefits	2,012	1,477
Taxes on earnings	1,529	1,818
Deferred revenues	3,260	1,867
Accrued restructuring	1,309	82
Other accrued liabilities	7,395	3,207
Total current liabilities	24,310	13,964
Long-term debt	6,035	3,729
Other liabilities	4,103	938
Stockholders' equity	36,262	13,953
Total liabilities and stockholders' equity	$ 70,710	$ 32,584

(a) Certain reclassifications have been made to prior year balances in order to conform to the current year presentation.

5.1.9 Hasbro (HAS)

Hasbro is a leader in the manufacture of toys, games, and puzzles. Hasbro was founded in 1923 by two brothers, Henry and Helal Hassenfield in Providence, Rhode Island. Hasbro includes the companies of Milton Bradley and Parker Brothers, both famous for board games. Hasbro also includes Playskool, famous for preschool toys, which joined the company in the mid 1980's. Hasbro is known to produce many toys, notably Mr. Potato Head, Transformers, G.I. Joe, and Star Wars.

Hasbro's indicators did not look pleasant. By the end of October, its stock prices were plummeting. The prices were on a downtrend since May. Its total assets decreased the past year and even though its debt decreased in a year, its earnings also decreased. We took a chance because we believed many children would receive toys that Hasbro created this holiday season.

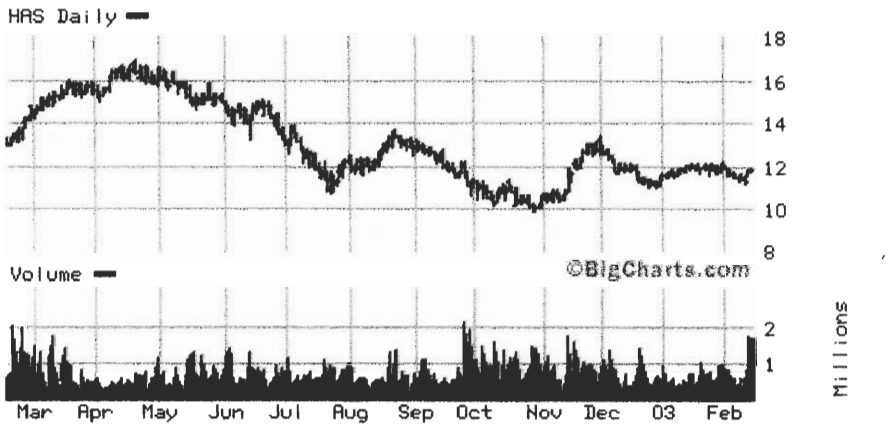


Fig. 5.16 Hasbro Stock Prices and Volume (Past Year)

Table 5.10 Hasbro Financial Summary (Past 2 Years)

HASBRO, INC.
CONSOLIDATED CONDENSED BALANCE SHEETS

(Thousands of Dollars)	September 29, 2002	September 30, 2001
ASSETS		
Cash and Cash Equivalents	$ 43,850	$ 37,080
Accounts Receivable, Net	799,122	785,807
Inventories	282,146	345,690
Other Current Assets	290,600	388,092
Total Current Assets	1,415,718	1,556,669
Property, Plant and Equipment, Net	213,628	256,982
Other Assets	1,494,852	1,776,935
Total Assets	$3,124,198	$3,590,586
LIABILITIES AND SHAREHOLDERS' EQUITY		
Short-term Borrowings	$ 63,392	$ 298,698
Current Installments of Long-term Debt	255,248	3,344
Payables and Accrued Liabilities	715,658	746,757
Total Current Liabilities	1,034,298	1,048,799
Long-term Debt	856,257	1,166,360
Deferred Liabilities	94,561	90,293
Total Liabilities	1,985,116	2,305,452
Total Shareholders' Equity	1,139,082	1,285,134
Total Liabilities and Shareholders' Equity	$3,124,198	$3,590,586

HASBRO, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

	Quarter Ended		Nine Months Ended	
	September, 29 2002	September, 30 2001	September, 29 2002	September, 30 2001
(Thousands of Dollars and Shares Except Per Share Data)				
Net Revenues	$ 820,532	$ 893,353	$1,818,789	$1,867,610
Cost of Sales	342,918	402,155	705,497	795,968
Gross Profit	477,614	491,198	1,113,292	1,071,642
Amortization	22,268	29,761	66,483	88,044
Royalties	85,210	65,105	202,378	131,504
Research and Product Development	36,687	32,077	106,670	92,281
Advertising	82,911	90,655	188,307	189,333
Selling, Distribution and Administration	153,821	169,826	445,081	480,854
Operating Profit	96,717	103,774	104,373	89,626
Interest Expense	17,897	26,116	55,756	77,327
Other (Income) Expense, Net	3,350	3,244	31,182	74

Earnings before Income Taxes and Cumulative Effect of Accounting Change	75,470	74,414	17,435	12,225
Income Taxes	19,622	23,812	4,533	3,912
Earnings before Cumulative Effect of Accounting Change	55,848	50,602	12,902	8,313
Cumulative Effect of Accounting Change, Net of Tax	-	-	(245,732)	(1,066)
Net Earnings (Loss)	$ 55,848	$ 50,602	$ (232,830)	$ 7,247
Per Common Share				
Earnings before Cumulative Effect of Accounting Change				
Basic and Diluted	$ 0.32	$ 0.29	$ 0.07	$ 0.05
Cumulative Effect of Accounting Change, Net of Tax				
Basic and Diluted	$ -	$ -	$ (1.42)	$ (0.01)
Net Earnings (Loss)				
Basic	$ 0.32	$ 0.29	$ (1.35)	$ 0.04
Diluted	$ 0.32	$ 0.29	$ (1.34)	$ 0.04
Cash Dividends Declared	$ 0.03	$ 0.03	$ 0.09	$ 0.09
Weighted Average Number of Shares				
Basic	172,758	172,140	172,692	172,032
Diluted	173,285	173,232	173,571	172,650

5.1.10 Mattel (MAT)

Mattel is also a leader in the manufacture of toys. Mattel was founded in 1945, by Elliot and Ruth Handler. Mattel is known for its Barbie dolls, Fisher-Price products, and Hot Wheels cars. Mattel regards the thoughtful management of the environment and health and safety of its employees and customers as one of its highest priorities and a key element in its corporate responsibility.

From Mattel's third quarter report released in October, the company increased its worldwide sales by 6% from the previous year, international sales increased by 17%,

and earnings per share rose eight cents to $0.58. By the beginning of October, a downtrend ended and an uptrend began. These were good indicators that Mattel would be a good stock to buy.

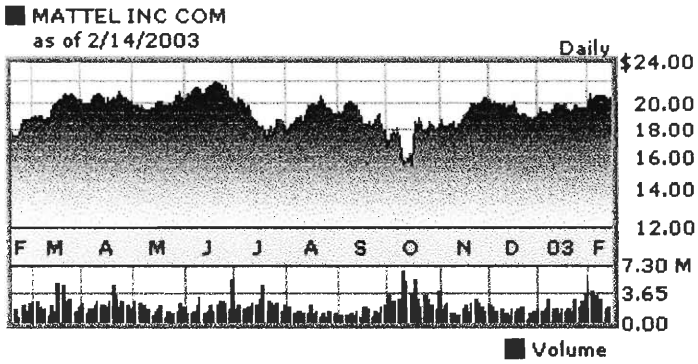


Fig. 5.17 Mattel Stock Prices and Volume (Past Year)

5.1.11 Summary

Many of the companies we selected had similar data. Many companies had a downtrend leading into October that looked as though they would end in November. We hoped that these were not secondary trends and that a new primary uptrend would begin. Most companies had large debts, but had sales, profits, and total assets increase from the previous year. We believed that each company has a chance to further succeed during the upcoming holiday season.

5.2 The Simulation

Our simulation involves buying and selling stocks of the previous section's companies. Our nine week simulation consisted of forty-two days when the market was open and active (we will refer to these days as "stock days"). The simulation started on Friday, November 15, 2002, and ended on Friday, January 17, 2003. The stock market was closed on Thanksgiving Day (Thursday, November 28, 2002), Christmas Day (Wednesday, December 25, 2002), and New Year's Day (Wednesday, January 1, 2003).

According to chapter 3, the companies we selected are categorized into two groups: Consumer and Technology. We took both groups and divided them into subgroups. The Consumer group is divided into two subgroups: retail chains (Wal-Mart, Amazon.com, Target, Best Buy) and toy manufacturers (Hasbro, Mattel). The Technology group is also divided into two subgroups: communication (AT&T Wireless, Verizon) and computers and electronics (Dell, Hewlett Packard). We categorized them into separate groups to organize and easily compare the companies. We can see if the companies in each group have similar trends and/or data. We can then analyze this information more easily which will be shown in the next chapter.

During our simulation we used the technical strategies of Dow's Theory, moving average line, and trading volume; the fundamental strategies of the vertical line chart and knowing when to buy and sell; and random walk strategies of speculation and risks.

5.2.1 Transactions

The transactions involved in our simulation consisted of buying shares in round lots: 1000 shares. This method allowed us to avoid complications and extra fees that are associated with odd lots. The numbers were also easier to calculate. We also ignored commission rates to avoid further calculation. We limited ourselves to $250,000. We did not want to feel as though we could buy any amount of shares at any price. We wanted to test certain strategies and see if we could make a profit. We used daily closing prices for our transactions.

Table 5.11 Simulation Transactions

Trans#	Date	Company	Buy/Sell	$/share	Total
1	11/15/02	Wal-Mart	Buy	55.49	55,490
2	11/15/02	Amazon	Buy	22.21	22,210
3	11/15/02	Verizon	Buy	39.31	39,310
4	11/15/02	AT&T	Buy	7.40	7,400
5	11/15/02	Dell	Buy	29.82	29,820
6	11/15/02	HP	Buy	16.90	16,900
7	11/15/02	Hasbro	Buy	11.68	11,680
8	11/15/02	Mattel	Buy	19.40	19,400
9	12/16/02	Amazon	Sell	22.51	(22,510)
10	12/17/02	Target	Buy	29.75	29,750
11	12/17/02	Best Buy	Buy	24.00	24,000

Trans#	Date	Company	Buy/Sell	$/share	Total
12	12/26/02	Dell	Sell	27.39	(27,390)
13	12/26/02	Amazon	Buy	20.30	20,300
14	1/7/03	Verizon	Sell	43.62	(43,620)
15	1/9/03	Wal-Mart	Sell	51.92	(51,920)
16	1/9/03	AT&T	Sell	7.30	(7,300)
17	1/10/03	Target	Sell	31.20	(31,200)
18	1/17/03	Amazon	Sell	21.40	(21,400)
19	1/17/03	HP	Sell	19.23	(19,230)
20	1/17/03	Hasbro	Sell	12.03	(12,030)
21	1/17/03	Mattel	Sell	20.16	(20,160)
22	1/17/03	Best Buy	Sell	27.70	(27,700)

Total Purchased: $276,260 Total Sold: $284,460

Net Profit: $8,200

Our first eight transactions were made on November 15, 2002. We used that Friday's closing prices to buy 1000 shares of each of eight companies: Wal-Mart, Amazon.com, Verizon, AT&T Wireless, Dell, Hewlett Packard, Hasbro, and Mattel. As previously mentioned in the last section, we chose these stocks at this time because of the upcoming holiday season and because the companies' downtrends seemed like they were ending. We believed that some of these companies would begin their uptrends at this time.

One of our strategies was to hold on to the stocks to analyze charts. We held on to our eight companies for twenty stock days and then analyzed the data. On December 16, 2002, we sold all 1000 shares of Amazon.com. After an initial uptrend that lasted two weeks, we noticed that its prices were falling below the price we bought it at. We noticed its moving average line was declining as well as its trading volume. These were not good signs and we decided to sell the shares. Luckily there was a secondary trend counteracting the downtrend and Amazon.com's stock price increased for a short period where it was higher than the price we bought it for. By selling at this time, we made a $300 profit. We still kept track of Amazon.com following our initial sell.

With Amazon.com being sold, we had enough money (having spent only $180,000 of $250,000) we decided to buy stocks in two more companies. The following day on December 17, 2002, we bought 1000 shares each of Target and Best Buy. At this period, Best Buy and Target were increasing in sales and stock prices following the Day-After-Thanksgiving sale. And with Christmas a week later, we thought these two companies would increase its sales. With Best Buy and Target in our portfolio we now had three retail chains in our Consumer group.

On December 26, 2002, we sold 1000 shares of Dell and bought 1000 shares of Amazon.com. The purchase kept us below our $250,000 limit. Both companies were doing poorly in the market. We noticed Dell was in a downtrend after a short initial uptrend, but its stock price kept falling. We noticed that the moving average line declined and the average decreased the past 15 stock days (December 4 – December 26). Its trading volume was also unusually low this day. The trading volume was under nine million when the normal during this period was twenty million. Christmas had passed and

we noticed a secondary movement, but we speculated this would not last so we sold the shares at a $2,430 loss. We also noticed Amazon.com had decreased in its stock price since we last sold it. We believed that this was the time to buy low even if the stock price was not doing well. We noticed the trading volume was unusually high that day, up twelve million from the previous day. We believed this was an indicator in the change of the downtrend. We hoped for an uptrend or a small profit by the end of our simulation. We now had four retail chains in our Consumer group and only one communications company in our Technology group.

On January 7, 2003, we sold all our shares of Verizon. The previous day Verizon's stock price reached its peak price in our simulation. We compared the next day's price with our buying price and there was a considerable profit. Verizon had increased its price by over four dollars per share. We took a look at the vertical line chart, trading volume which was unusually high, and moving average line which increased and the data indicated it was a good time to sell. We gained $4,310.

On January 9, 2003, we sold Wal-Mart and AT&T Wireless. Wal-Mart, like Dell, proved to be a poor company to invest in during our simulation. The stock price was at its highest during the beginning of our simulation, but we insisted on holding on to the stock because we thought it would rebound. We decided we could not hold on to Wal-Mart any longer since our simulation was ending soon. We saw that the trading volume was the highest in twelve stock days and that the stock price was the highest in sixteen stock days. We sold Wal-Mart at a $3,570 loss. We did not want to lose more. We sold AT&T Wireless for similar reasons. The stock price had declined and on this date, the price was the highest in twenty-four stock days. We speculated this may be a secondary

trend and took advantage of it before the price could decrease again. We sold it at a $100 loss.

On January 10, 2003, we sold Target. The day before, we noticed that its trading volume and stock price were the highest since we bought it. The moving average line was also increasing. We decided with the simulation ending in a week, we should sell now at a profit rather than risking it. We gained $1,450.

On January 17, 2003, the final day of our simulation, we still owned Hewlett Packard, Hasbro, Mattel, Best Buy and Amazon.com. We had to sell. We kept Hewlett Packard, Hasbro, and Mattel for all nine weeks and it turned out to be successful. Hewlett Packard gave us a $2,330 profit. Hasbro gave us a $350 profit. Mattel gave us a $760 profit. Best Buy gave us a $3,700 profit. Amazon.com also turned in a $1,100 profit. Overall, we received an $8,200 profit.

5.3 Conclusion

In this chapter, we described information on the companies we selected to invest in during our stock market simulation. We gave a brief history of the company, what the company services in, and its financial situation. We also explained why we chose those companies and included financial data from third quarter, fourth quarter, or annual reports. We also gave a stock chart of the past 52 weeks. We also explained the strategies we used during our simulation and the transactions we made giving reasons in the process. The next chapter will further analyze the results of our simulation citing

specific reasons why trends occurred. The next chapter will include charts, tables, and graphs we created from our simulation data.

Chapter 6:

Simulation Results and Analysis

The previous chapter described the companies we invested in, the transactions we performed, and the strategies we used during our simulation. Our simulation ended on January 17, 2003. This chapter will present our simulation results. This will include a vertical line chart, moving average line graph, closing price graph, trading volume graph, and a table of the data for these graphs for each company. We will then analyze our results and attempt to explain why these results happened. Our explanations may include company and world events and comparisons to two indexes that we followed during our simulation: the Dow Jones Industrial Average (DJIA) and NASDAQ.

6.1 Indexes

The following present data results of two indexes we followed throughout our simulation: DJIA and NASDAQ. These include a vertical line chart, moving average line, the data of highs, lows, and closing prices, and an explanation of uptrends and downtrends.

6.1.1 Dow Jones Industrial Average

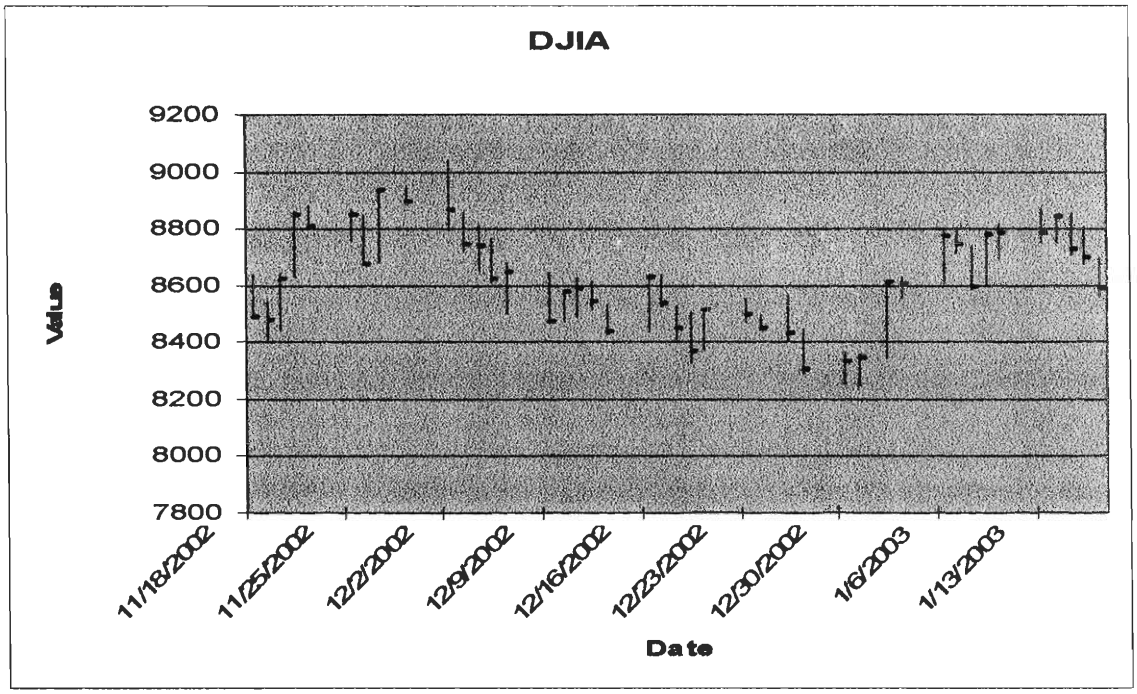


Fig. 6.1 DJIA Vertical Line Chart

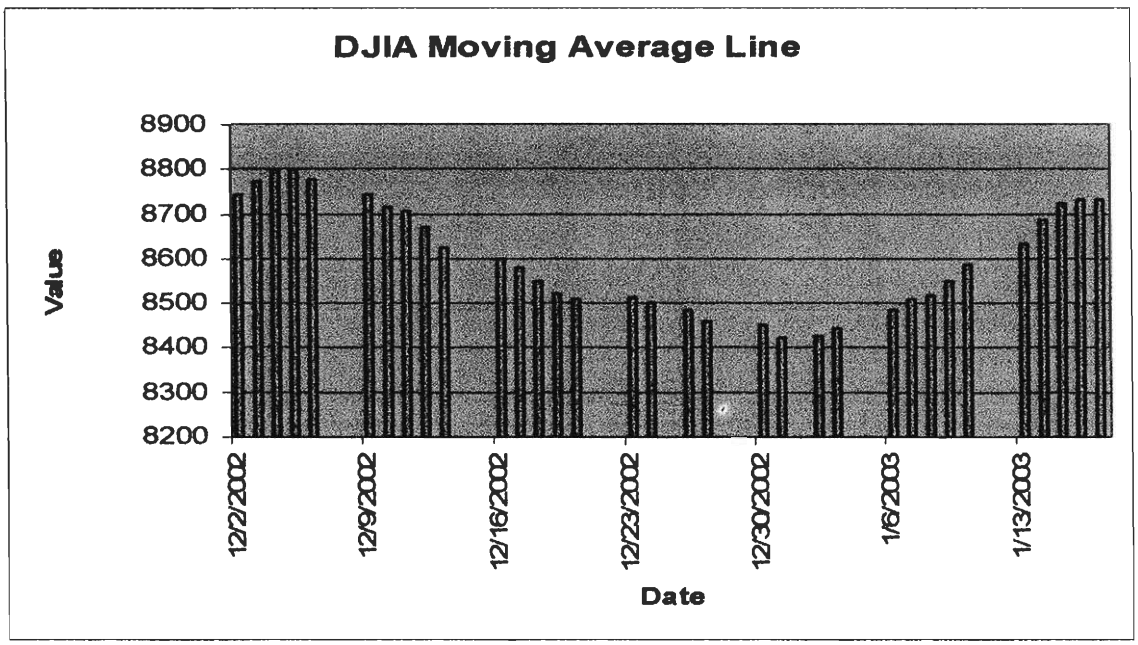


Fig. 6.2 DJIA Moving Average Line

Table 6.1 DJIA Simulation Results

Date	High	Low	Close	Moving Avg.
18-Nov	8636.2	8480.6	8486.5	
19-Nov	8546.8	8405.1	8474.7	
20-Nov	8643	8439	8623	
21-Nov	8856.5	8625.4	8845.1	
22-Nov	8880.3	8801	8804.8	
25-Nov	8868.8	8756	8849.4	
26-Nov	8844.4	8670.1	8676.4	
27-Nov	8939.9	8678.9	8931.6	
29-Nov	8950.3	8891.2	8896	
2-Dec	9043.3	8787.1	8862.5	8745
3-Dec	8861.1	8721.8	8742.9	8770.64
4-Dec	8811.6	8653.3	8737.8	8796.95
5-Dec	8769	8608.7	8623.2	8796.97
6-Dec	8679.5	8501.8	8645.7	8777.03
9-Dec	8643.9	8473	8473.4	8743.89
10-Dec	8578.9	8469.5	8574.2	8716.37
11-Dec	8625.8	8487.5	8589.1	8707.64
12-Dec	8615.1	8510.8	8538.4	8668.32
13-Dec	8536	8422.9	8433.8	8622.1
16-Dec	8627.5	8434.7	8627.4	8598.59
17-Dec	8638.6	8525	8535.3	8577.83
18-Dec	8531.3	8407.7	8447.3	8548.78
19-Dec	8505.2	8327.7	8364.8	8522.94
20-Dec	8513.6	8367.4	8512	8509.57
23-Dec	8554	8462.6	8493.2	8511.55
24-Dec	8491.9	8443.6	8448.1	8498.94
26-Dec	8565	8408.7	8432.6	8483.29
27-Dec	8449.4	8285.1	8303.7	8459.82
30-Dec	8364.7	8252.5	8332.8	8449.72
31-Dec	8361.3	8242.9	8341.6	8421.14
2-Jan	8608.2	8342.3	8607.5	8428.36
3-Jan	8635.4	8552.8	8601.6	8443.79
6-Jan	8800.5	8602.1	8773.5	8484.66
7-Jan	8802.6	8713	8740.5	8507.51
8-Jan	8736	8580.1	8595.3	8517.72
9-Jan	8787.7	8596.6	8776.1	8550.52
10-Jan	8818.5	8689.5	8784.8	8585.74
13-Jan	8869.2	8746.9	8785.9	8633.96
14-Jan	8843.3	8746.3	8842.6	8684.94
15-Jan	8854.6	8702.1	8723.1	8723.09
16-Jan	8805.5	8673	8697.8	8732.12
17-Jan	8695.8	8559.1	8586.4	8730.6

From our simulation data, the DJIA reached its highest point on December 2, while reaching its lowest points during the days before the new year began. In January, the index began an upward trend during the last two weeks of our simulation. An article by Steve Gelsi explained that the uptrend resulted from a flood of retail numbers and earnings that helped SAP and General Motors. The two weeks before our simulation ended raised enough optimism in the market to produce good results in the DJIA. The article explains how President Bush's economic plan, signs of an uptick in the economy, and stock market gains, are encouraging consumers to go into a buying mood. The buying mood helped the DJIA increase its level. The article also states that the uptrend resulted from positive moves in the geopolitical front. There were reports that the Iraq situation would be resolved with the release of a final report from U.N. arms inspectors. Signs of a possible thaw in U.S. relations with North Korea also surfaced (Gelsi 1).

However, after our simulation ended, another news article reported that the DJIA was on a three month low. The DJIA had reached its lowest level since October 17, 2002 on Janary 24, 2003. The short two week uptrend was only a secondary movement. The downtrend can be explained by the possibility of war as problems with the Middle East were not resolved in the previous two weeks. The market was hit hard with war worries as United States forces massed in the Gulf and as Washington, D.C. argued over the Iraq situation on whether or not it should be disarmed by force. The dollar decreased in value, gold increased in value, and oil prices increased. "The market is in desperate need of a resolution of the conflict if it going to have any chance of mounting a recovery this year," said Harry Michas, stock index futures trader at manmarketmonitor.com (Duclaux 1).

6.1.2 NASDAQ

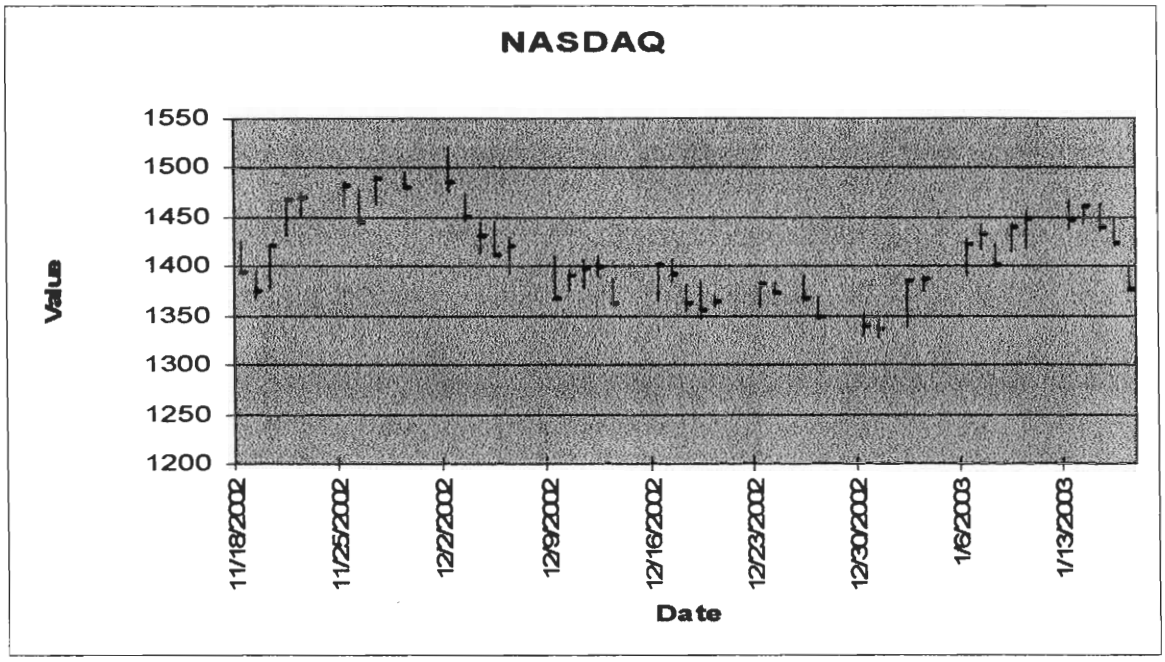


Fig. 6.3 NASDAQ Vertical Line Chart

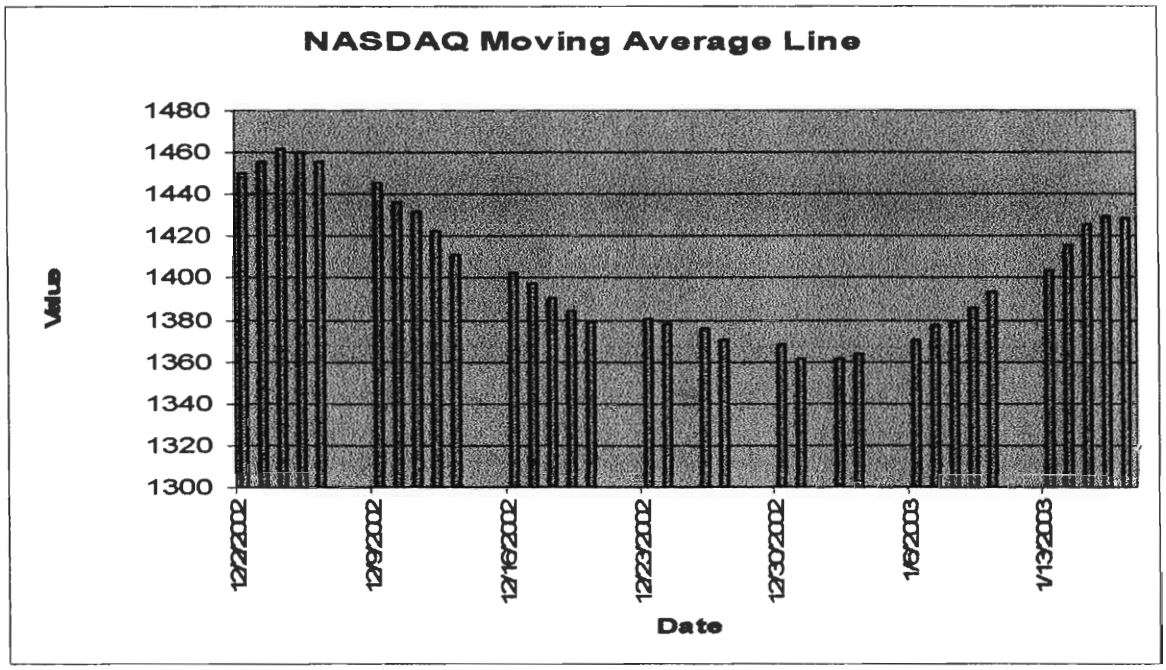


Fig. 6.4 NASDAQ Moving Average Line

Table 6.2 NASDAQ Simulation Results

Date	High	Low	Close	Moving Avg.
18-Nov	1425.42	1393.66	1393.71	
19-Nov	1394.93	1367.76	1374.51	
20-Nov	1419.64	1375.41	1419.35	
21-Nov	1468.72	1430.08	1467.55	
22-Nov	1475.35	1449.5	1468.74	
25-Nov	1486.94	1461.13	1481.9	
26-Nov	1478.73	1441.12	1444.43	
27-Nov	1491.45	1462.62	1487.94	
29-Nov	1497.44	1478.72	1478.78	
2-Dec	1521.44	1474.59	1484.78	1450.169
3-Dec	1474.69	1445.23	1448.96	1455.694
4-Dec	1444.18	1412.92	1430.35	1461.278
5-Dec	1445.95	1410.58	1410.75	1460.418
6-Dec	1430.39	1391.1	1419.39	1455.602
9-Dec	1411.4	1367.07	1367.14	1445.442
10-Dec	1397.84	1373.89	1390.76	1436.328
11-Dec	1407.15	1377.71	1396.59	1431.544
12-Dec	1411.69	1388.51	1399.55	1422.705
13-Dec	1387.71	1362.56	1362.57	1411.084
16-Dec	1400.49	1365.66	1400.33	1402.639
17-Dec	1408.16	1385.37	1392.05	1396.948
18-Dec	1380.63	1355.55	1361.51	1390.064
19-Dec	1384.58	1346.18	1354.1	1384.399
20-Dec	1370.79	1358.8	1363.12	1378.772
23-Dec	1384.29	1358.29	1381.69	1380.227
24-Dec	1382.93	1372.38	1372.47	1378.398
26-Dec	1392.58	1363.61	1367.89	1375.528
27-Dec	1369.21	1346.65	1348.31	1370.404
30-Dec	1353.38	1329.64	1339.54	1368.101
31-Dec	1345.11	1327.19	1335.51	1361.619
2-Jan	1384.91	1336.98	1384.85	1360.899
3-Jan	1389.44	1374.61	1387.08	1363.456
6-Jan	1428.65	1390.09	1421.32	1370.178
7-Jan	1442.26	1416.23	1431.57	1377.023
8-Jan	1424.12	1399.06	1401.07	1378.961
9-Jan	1445.09	1414.47	1438.46	1385.56
10-Jan	1457.45	1418.79	1447.72	1393.543
13-Jan	1467.35	1436.98	1446.04	1403.316
14-Jan	1461.12	1442.63	1460.99	1415.461
15-Jan	1463.99	1435.29	1438.8	1425.79
16-Jan	1449.13	1420.11	1423.75	1429.68
17-Jan	1401.37	1376.18	1376.19	1428.591

NASDAQ had similar patterns to the DJIA. In our simulation it peaked on December 2 and was at its lowest on the days before 2003. Two weeks before our simulation ended, NASDAQ reached a high level thanks to strong performances by software and networking stocks. Cisco favored well for NASDAQ as it reached a high volume for that period. The uptrend can be explained by similar reasons that produced an uptrend for the DJIA. And similarly, NASDAQ reached its lowest level after our simulation ended for the same reasons as the DJIA; war worries (Gelsi 1)

6.2 Consumer Group

The following are the stock companies we categorized into the Consumer group. These six companies are divided into two subgroups: retail chains and toy manufacturers. Each subgroup is presented company by company with vertical line charts, moving average lines, closing price graphs, volume graphs, and data tables. Following the results is a summary which includes similarities and differences of the companies in the subgroup and explanations of the uptrends and downtrends.

6.2.1 Retail Chains

The retail chains include Wal-Mart, Amazon.com, Best Buy, and Target.

a) Wal-Mart

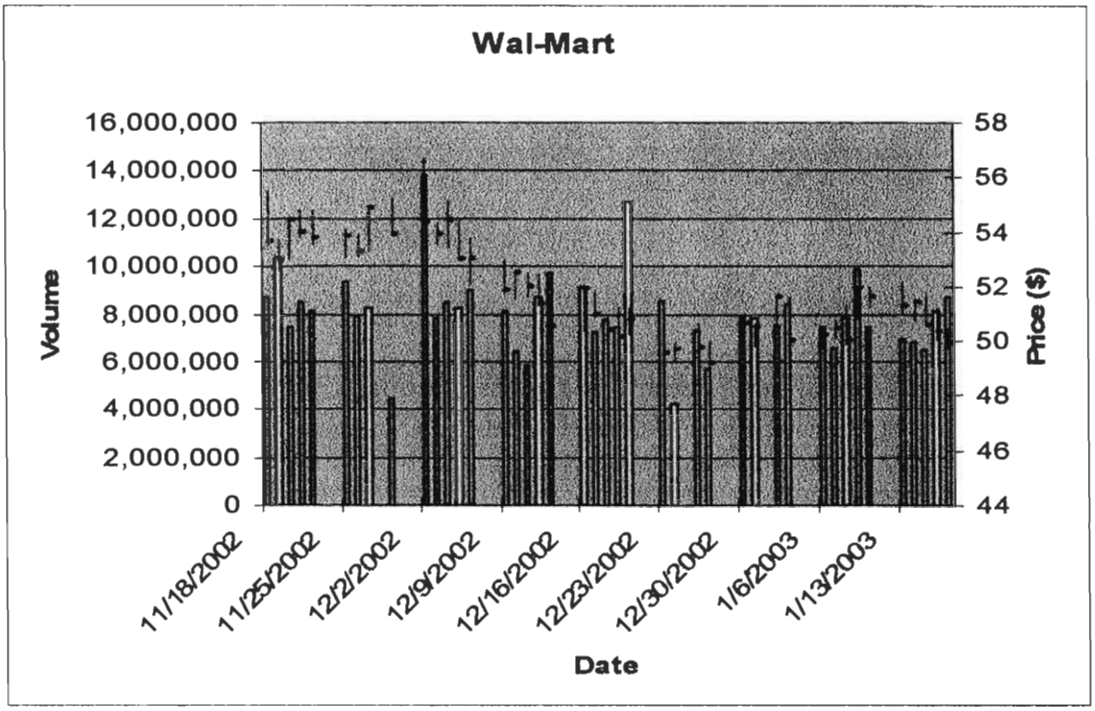


Fig. 6.5 Wal-Mart Vertical Line Chart with Volume

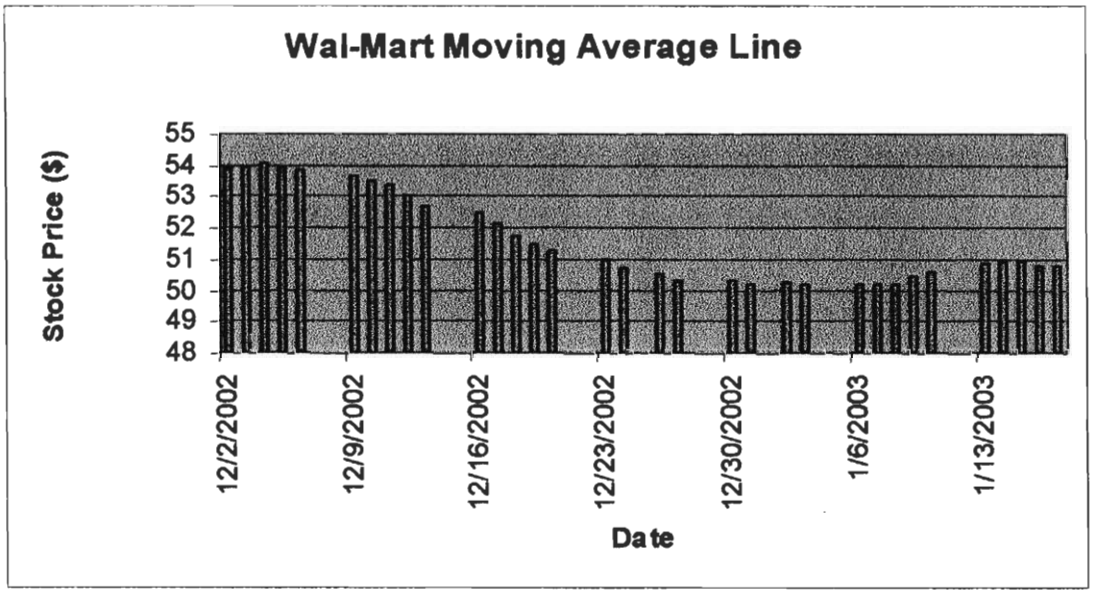


Fig 6.6 Wal-Mart Moving Average Line

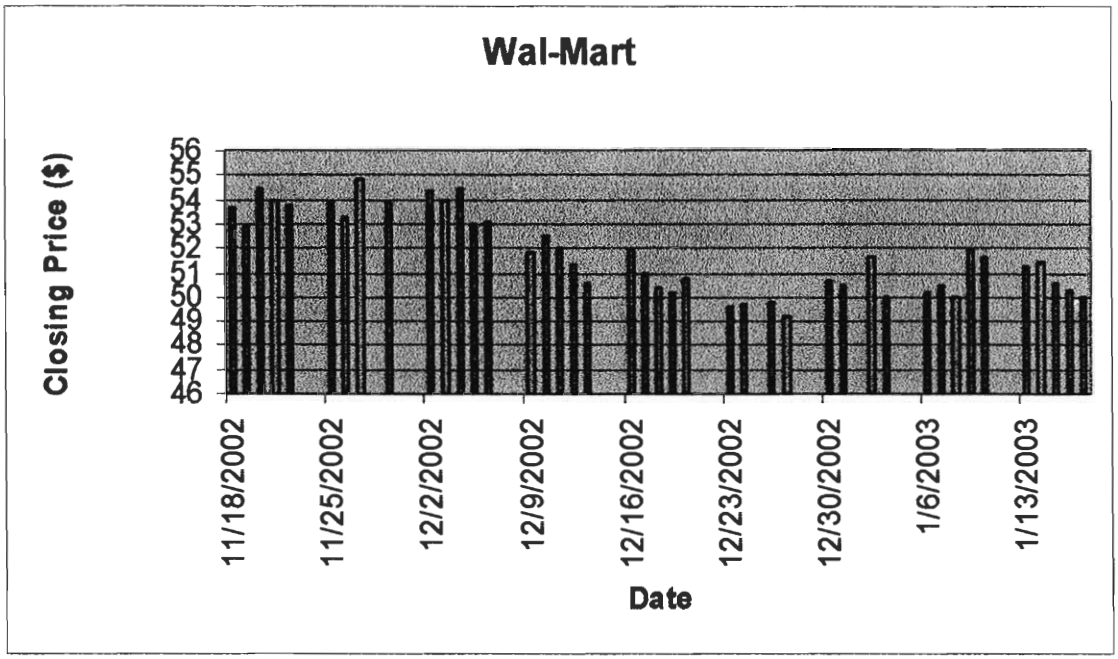


Fig. 6.7 Wal-Mart Closing Price Graph

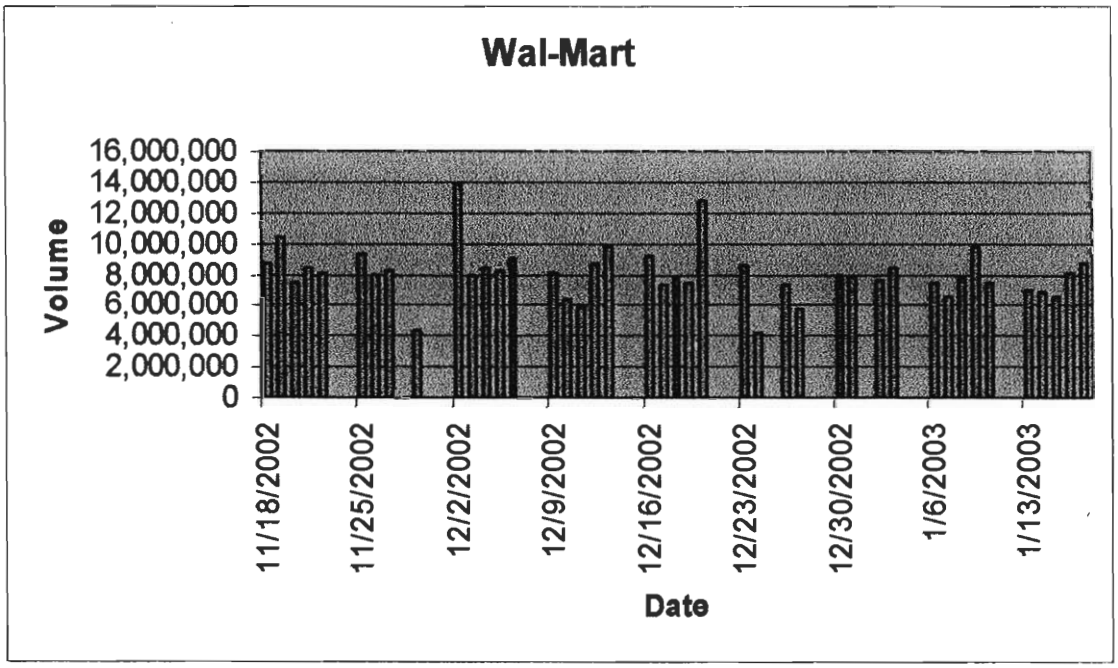


Fig. 6.8 Wal-Mart Volume Graph

Table 6.3 Wal-Mart Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
18-Nov	8,729,300	55.5	53.53	53.68	
19-Nov	10,348,300	53.69	52.57	52.92	
20-Nov	7,463,600	54.5	53	54.4	
21-Nov	8,441,400	54.8	53.81	53.95	
22-Nov	8,124,400	54.79	53.52	53.76	
25-Nov	9,359,900	54.1	53.02	53.82	
26-Nov	7,896,900	53.9	53.07	53.24	
27-Nov	8,288,400	55.01	53.25	54.84	
29-Nov	4,420,200	55.16	53.83	53.9	
2-Dec	13,776,600	56.74	54.25	54.38	53.889
3-Dec	7,852,200	54.38	53.55	53.93	53.914
4-Dec	8,449,800	55.13	53.41	54.44	54.066
5-Dec	8,258,000	54.44	53.02	53.02	53.928
6-Dec	8,952,900	53.8	52.03	53.04	53.837
9-Dec	8,080,700	53.04	51.81	51.85	53.646
10-Dec	6,413,000	52.59	51.55	52.49	53.513
11-Dec	5,826,000	52.49	51.63	52	53.389
12-Dec	8,668,300	52.42	51.26	51.38	53.043
13-Dec	9,721,500	51.38	50.36	50.54	52.707
16-Dec	9,138,500	52.07	50.36	51.94	52.463
17-Dec	7,234,900	51.86	50.85	50.94	52.164
18-Dec	7,738,600	50.95	49.95	50.38	51.758
19-Dec	7,478,600	51.2	50	50.16	51.472
20-Dec	12,702,400	51.25	50.17	50.79	51.247
23-Dec	8,539,200	50.54	49.4	49.59	51.021
24-Dec	4,215,600	49.87	49.24	49.7	50.742
26-Dec	7,308,300	50.65	49.25	49.76	50.518
27-Dec	5,689,600	49.98	48.95	49.16	50.296
30-Dec	7,886,000	50.75	49.15	50.64	50.306
31-Dec	7,826,300	50.62	49.75	50.51	50.163
2-Jan	7,545,500	51.61	50.52	51.6	50.229
3-Jan	8,390,300	51.61	49.85	50	50.191
6-Jan	7,438,400	50.55	49.67	50.19	50.194
7-Jan	6,581,800	50.76	50.1	50.46	50.161
8-Jan	7,796,900	51.36	49.86	49.99	50.201
9-Jan	9,857,700	52	50.75	51.92	50.423
10-Jan	7,426,600	52	51.21	51.62	50.609
13-Jan	6,920,900	52.18	51	51.28	50.821
14-Jan	6,759,600	51.54	50.7	51.41	50.898
15-Jan	6,503,400	51.68	50.53	50.59	50.906
16-Jan	8,086,900	51.23	49.98	50.3	50.776
17-Jan	8,660,300	50.43	49.7	49.97	50.773

b) Amazon.com

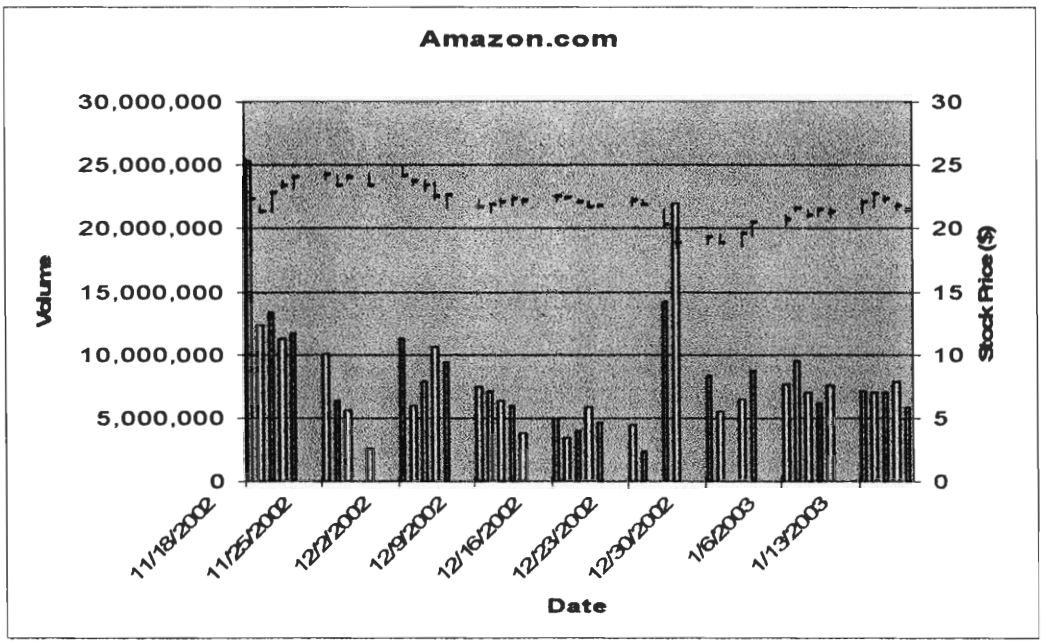


Fig. 6.9 Amazon.com Vertical Line Chart with Volume

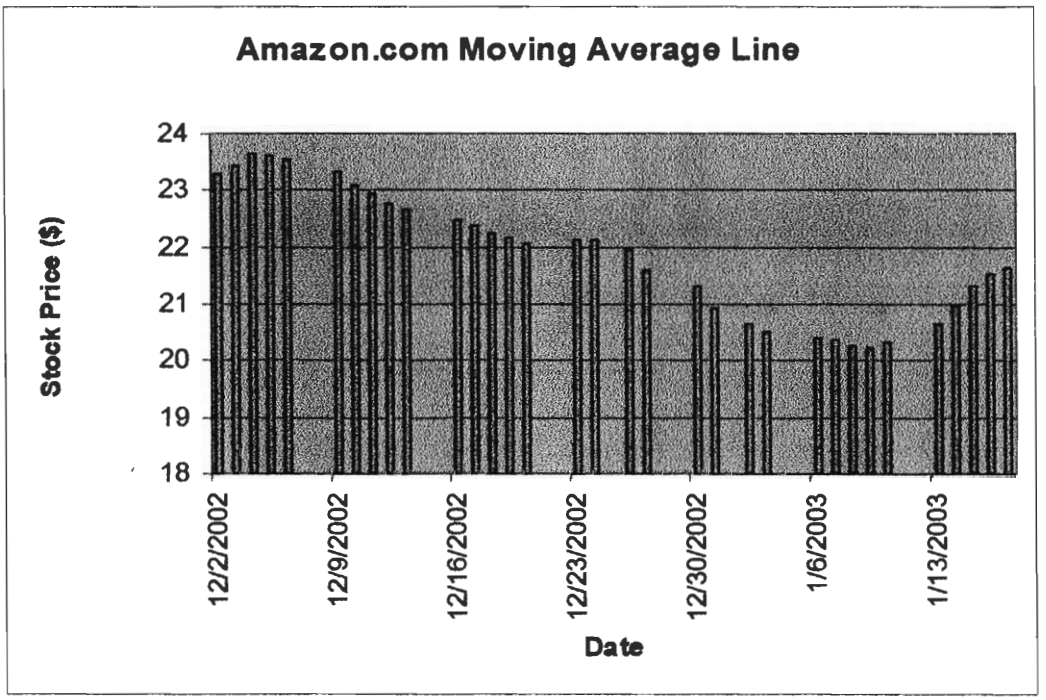


Fig. 6.10 Amazon.com Moving Average Line

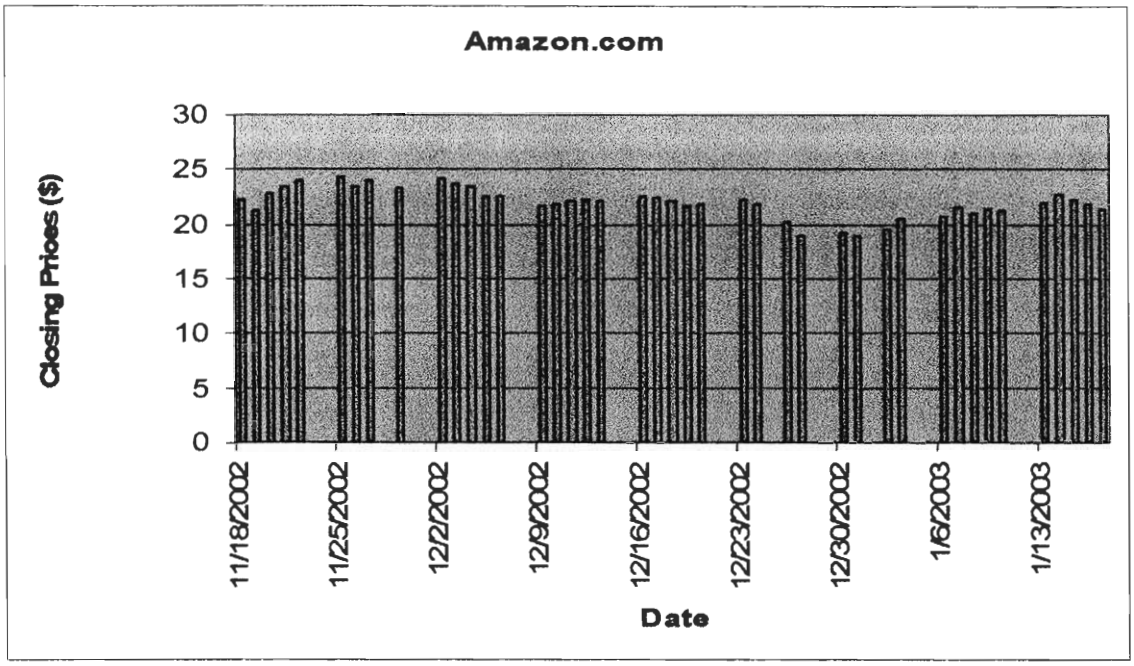


Fig. 6.11 Amazon.com Closing Price Graph

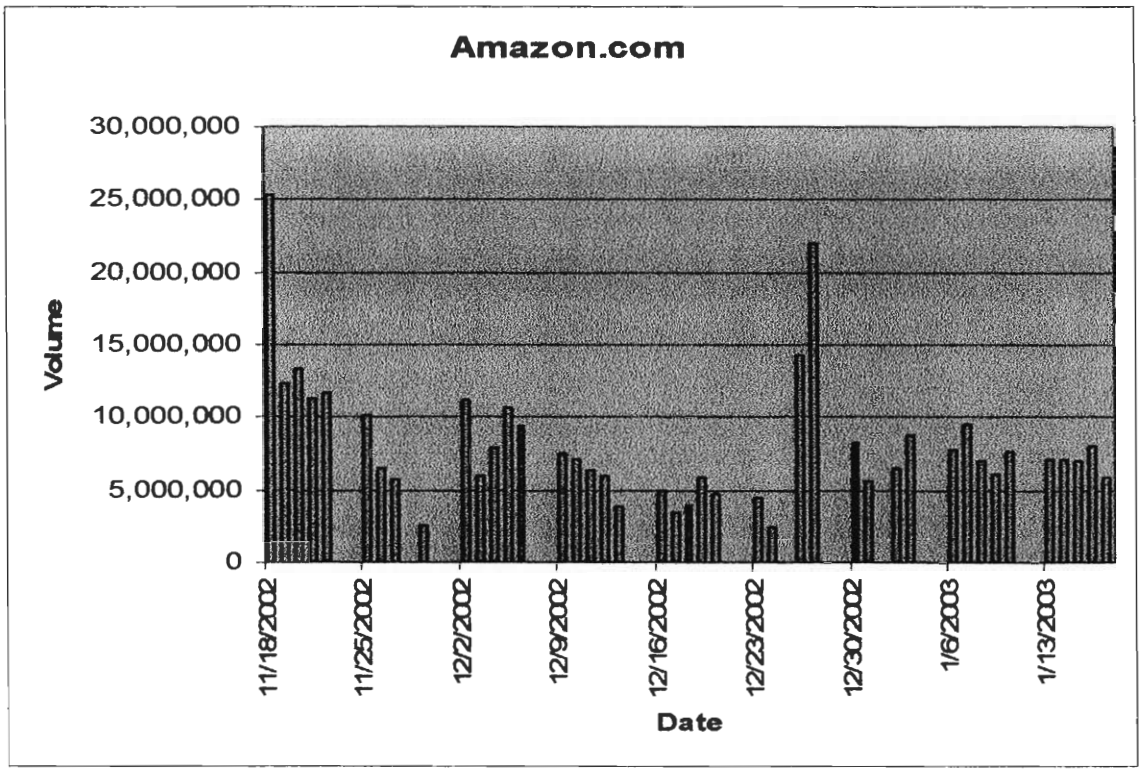


Fig. 6.12 Amazon.com Volume Graph

Table 6.4 Amazon.com Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
18-Nov	25,303,000	23.74	22.15	22.33	
19-Nov	12,307,273	21.89	21.23	21.29	
20-Nov	13,349,146	23	21.22	22.9	
21-Nov	11,305,686	23.85	23.21	23.4	
22-Nov	11,697,800	24.28	23.1	23.99	
25-Nov	10,108,722	24.5	23.82	24.25	
26-Nov	6,430,408	24.21	23.38	23.4	
27-Nov	5,675,004	24.24	23.71	24.08	
29-Nov	2,582,445	24.38	23.33	23.35	
2-Dec	11,214,300	25	24	24.11	23.31
3-Dec	5,947,427	23.98	23.38	23.74	23.451
4-Dec	7,889,572	23.8	22.96	23.39	23.661
5-Dec	10,654,738	23.68	22.2	22.58	23.629
6-Dec	9,410,369	22.69	21.51	22.61	23.55
9-Dec	7,462,049	22.35	21.6	21.68	23.319
10-Dec	7,117,879	21.99	21.24	21.86	23.08
11-Dec	6,397,023	22.38	21.62	22.13	22.953
12-Dec	5,997,041	22.62	21.81	22.3	22.775
13-Dec	3,833,520	22.35	21.87	22.18	22.658
16-Dec	4,975,850	22.53	22.04	22.51	22.498
17-Dec	3,424,016	22.56	22.32	22.46	22.37
18-Dec	3,997,813	22.26	21.98	22.11	22.242
19-Dec	5,824,597	22.2	21.53	21.65	22.149
20-Dec	4,648,047	22.01	21.6	21.8	22.068
23-Dec	4,431,316	22.47	21.78	22.24	22.124
24-Dec	2,351,796	22.28	21.88	21.88	22.126
26-Dec	14,210,677	21.6	20	20.3	21.943
27-Dec	22,004,045	20.1	18.43	18.86	21.599
30-Dec	8,320,691	19.4	18.74	19.25	21.306
31-Dec	5,555,714	19.56	18.83	18.89	20.944
2-Jan	6,529,546	19.68	18.55	19.57	20.655
3-Jan	8,790,509	20.53	19.41	20.52	20.496
6-Jan	7,730,326	21.17	20.3	20.7	20.401
7-Jan	9,581,865	21.75	21.3	21.55	20.376
8-Jan	7,016,938	21.6	20.82	21.02	20.254
9-Jan	6,161,617	21.7	20.9	21.45	20.211
10-Jan	7,611,613	21.67	20.81	21.32	20.313
13-Jan	7,135,949	22.1	21.25	22.04	20.631
14-Jan	7,072,872	22.76	21.66	22.7	20.976
15-Jan	7,015,894	22.61	21.94	22.27	21.314
16-Jan	7,952,655	22.1	21.45	21.79	21.536
17-Jan	5,820,636	21.71	21.23	21.4	21.624

c) Best Buy

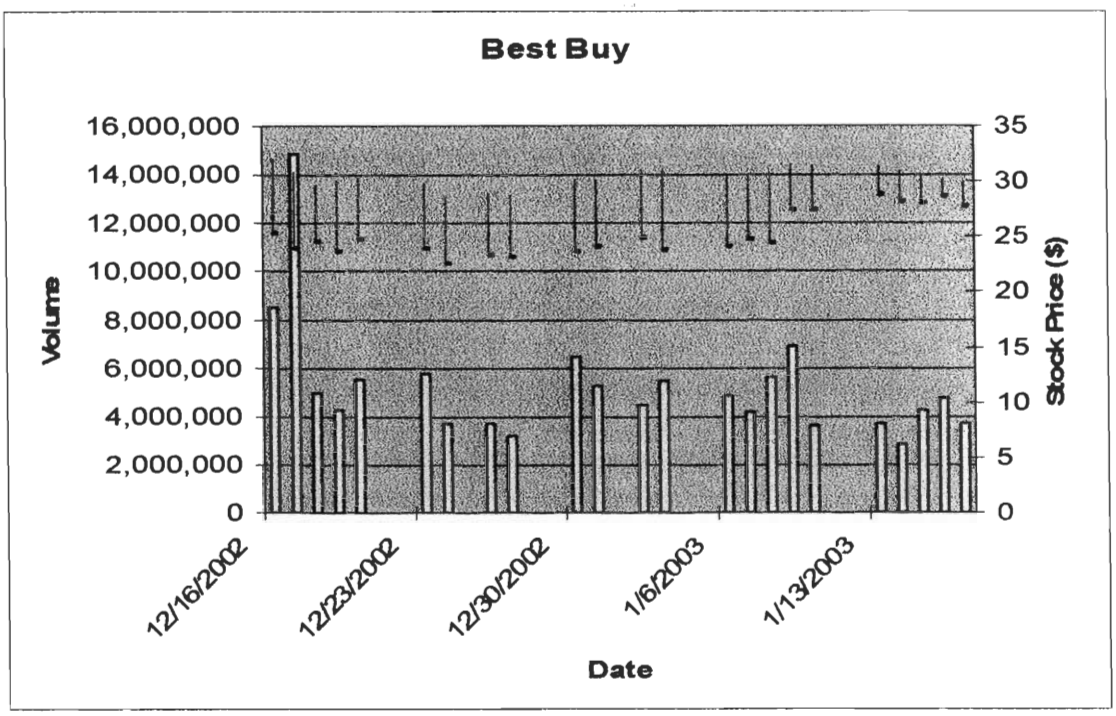


Fig. 6.13 Best Buy Vertical Line Chart with Volume

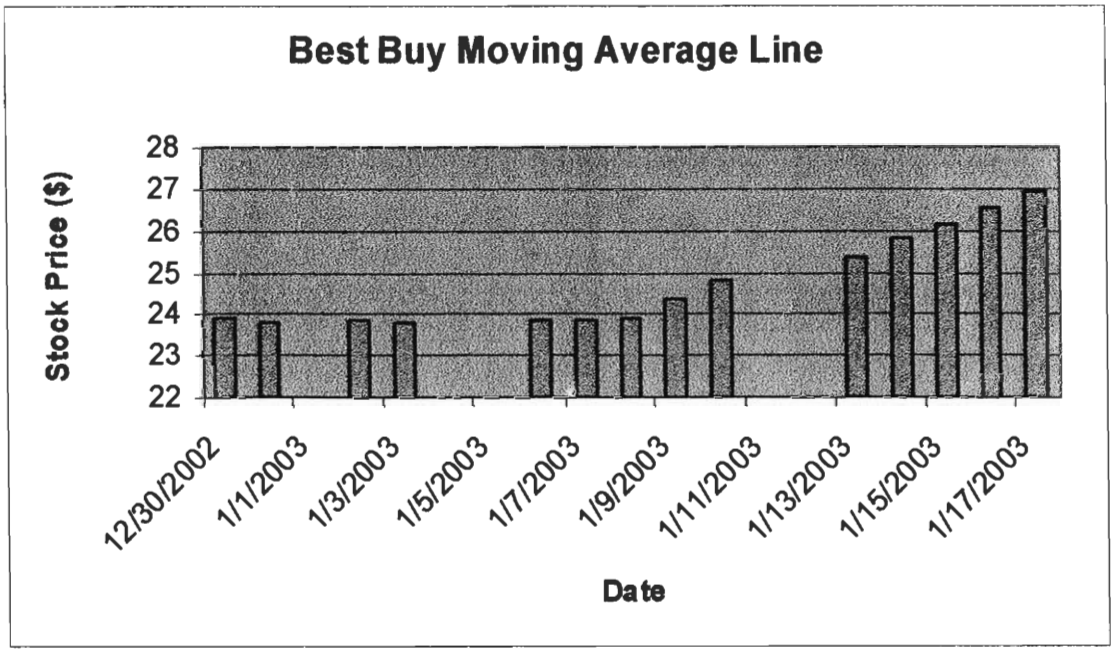


Fig. 6.14 Best Buy Moving Average Line

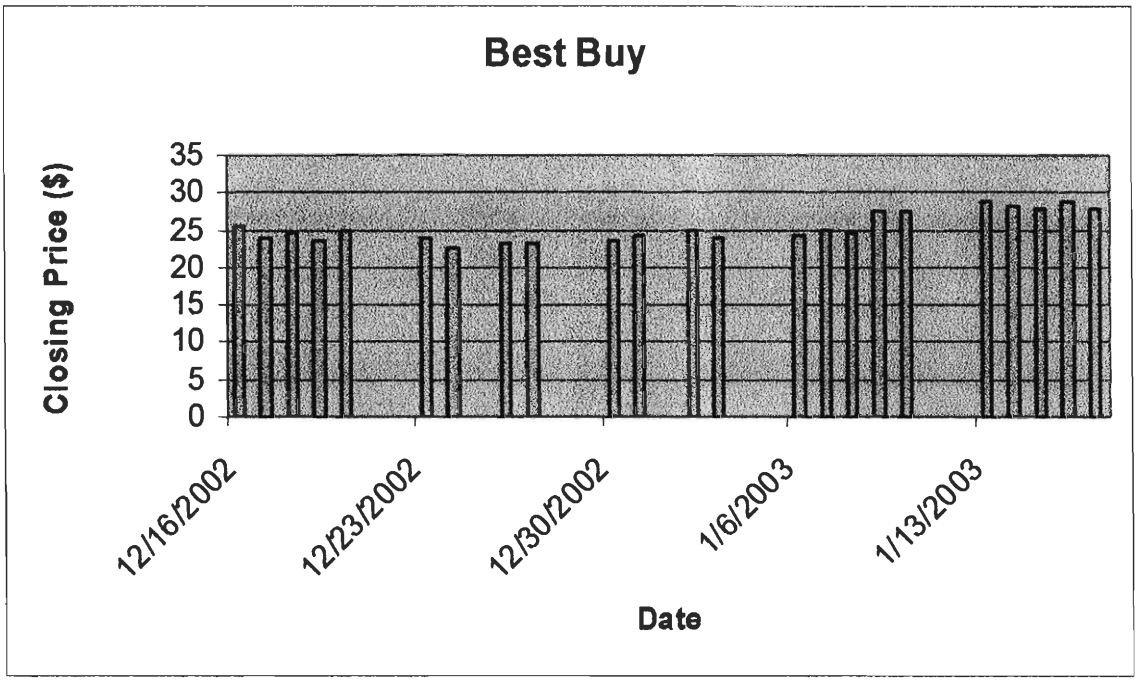


Fig. 6.15 Best Buy Closing Price Graph

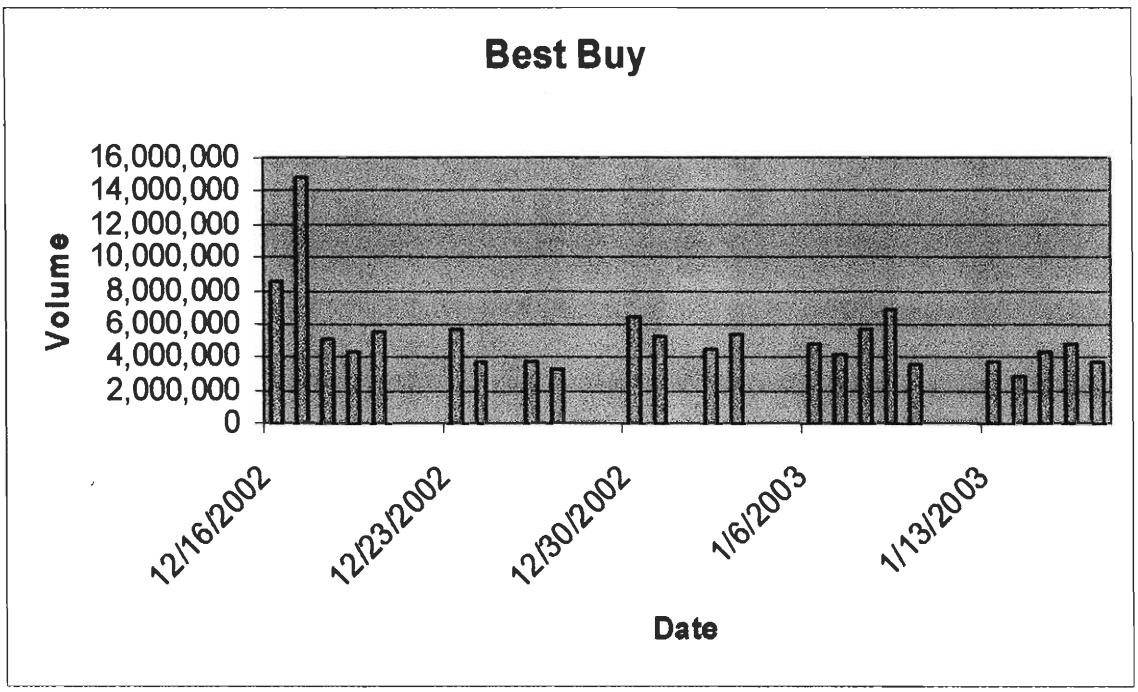


Fig. 6.16 Best Buy Volume Graph

Table 6.5 Best Buy Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
16-Dec	8,538,600	31.99	29.98	25.4	
17-Dec	14,827,700	30.88	29.01	24	
18-Dec	5,012,100	29.76	29.32	24.57	
19-Dec	4,290,200	30.2	29.25	23.7	
20-Dec	5,555,300	30.29	29.71	24.75	
23-Dec	5,750,600	29.9	28.39	23.97	
24-Dec	3,689,300	28.55	27.62	22.49	
26-Dec	3,733,300	28.96	28	23.3	
27-Dec	3,215,100	28.81	28.25	23.11	
30-Dec	6,459,600	30.25	28.2	23.68	23.897
31-Dec	5,289,100	30.15	29.17	24.15	23.772
2-Jan	4,478,100	31.11	29.9	24.96	23.868
3-Jan	5,454,400	31.12	29.77	23.86	23.797
6-Jan	4,816,800	30.45	29.31	24.11	23.838
7-Jan	4,168,600	30.7	29.78	24.75	23.838
8-Jan	5,627,700	30.8	29.55	24.4	23.881
9-Jan	6,915,600	31.59	30.57	27.34	24.366
10-Jan	3,610,100	31.44	30.7	27.4	24.776
13-Jan	3,729,100	31.5	30.25	28.85	25.35
14-Jan	2,861,900	30.95	30.28	28.08	25.79
15-Jan	4,297,200	30.5	29.66	27.96	26.171
16-Jan	4,796,100	30.37	29.77	28.67	26.542
17-Jan	3,666,900	30	29.55	27.7	26.926

d) Target

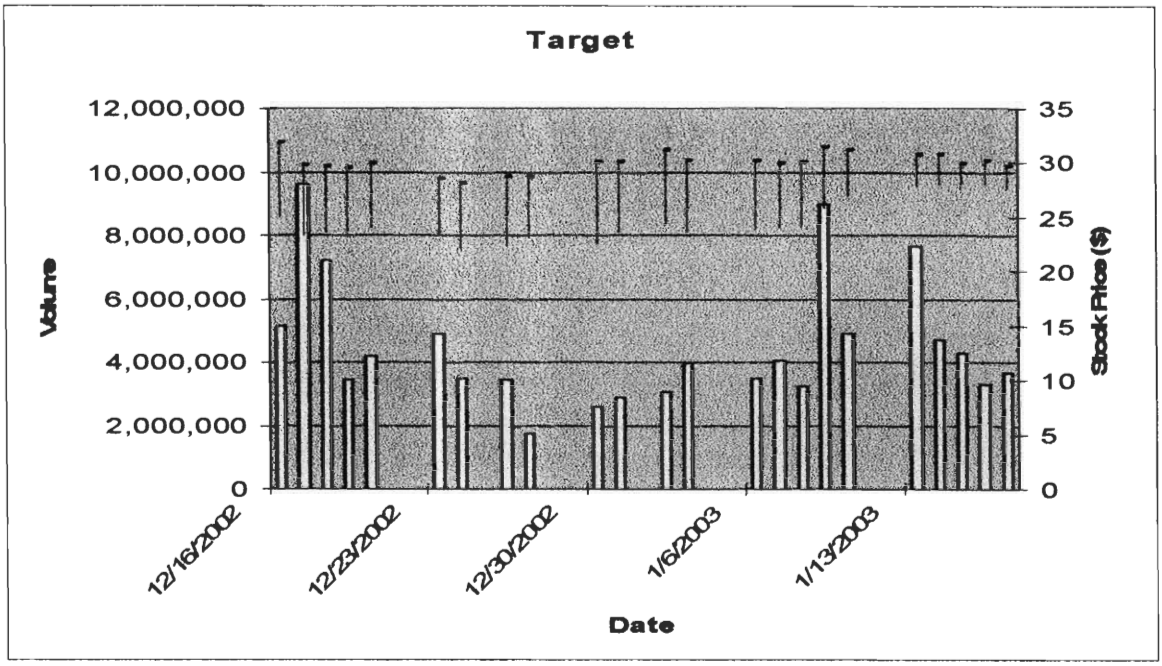


Fig. 6.17 Target Vertical Line Chart with Volume

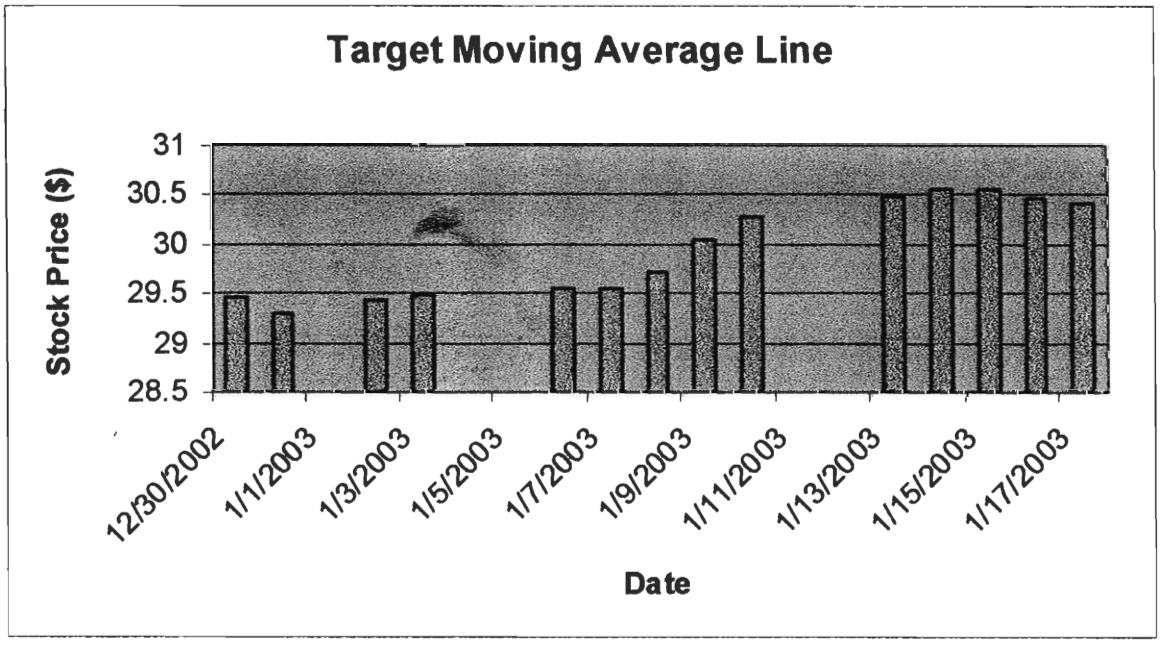


Fig. 6.18 Target Moving Average Line

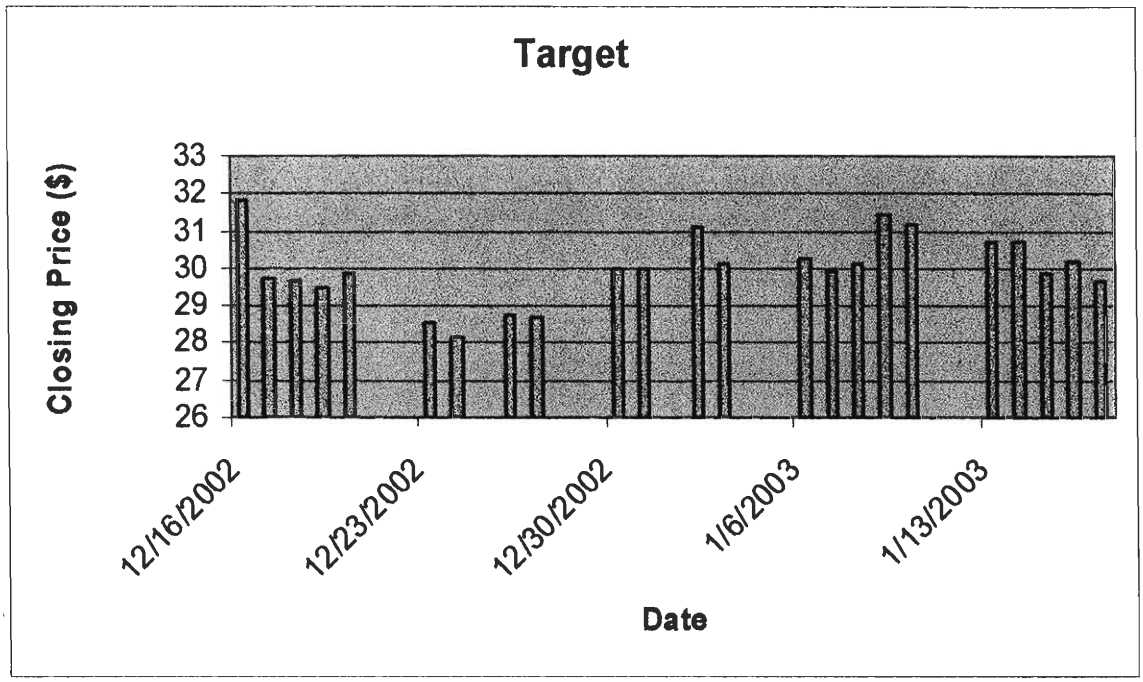


Fig. 6.19 Target Closing Price Graph

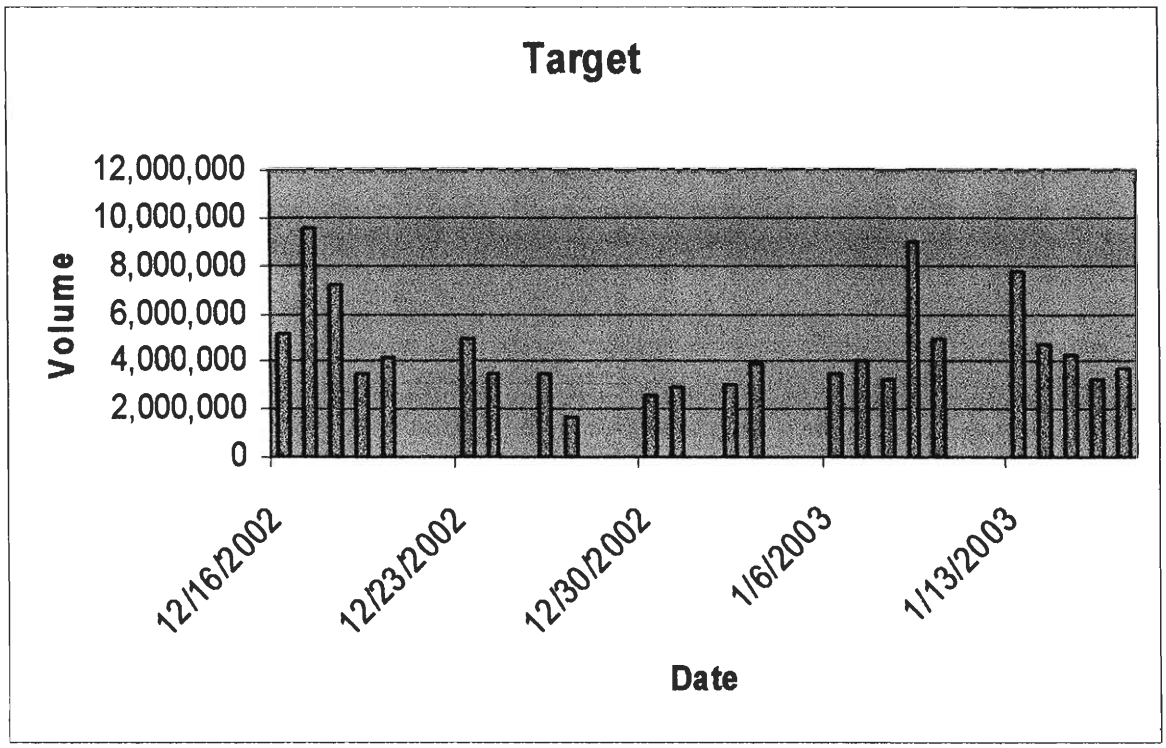


Fig. 6.20 Target Volume Graph

Table 6.6 Target Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
16-Dec	5,137,800	25.71	25	31.8	
17-Dec	9,586,800	25.3	23.31	29.75	
18-Dec	7,187,700	24.6	23.49	29.65	
19-Dec	3,439,700	24.65	23.57	29.48	
20-Dec	4,190,300	24.88	24.05	29.89	
23-Dec	4,912,800	24.76	23.31	28.54	
24-Dec	3,467,300	23.1	22.1	28.18	
26-Dec	3,428,900	23.55	22.4	28.75	
27-Dec	1,729,700	23.56	23.03	28.65	
30-Dec	2,603,100	23.85	22.48	30	29.469
31-Dec	2,879,400	24.27	23.6	30	29.289
2-Jan	3,039,500	24.99	24.29	31.11	29.425
3-Jan	3,947,100	24.61	23.65	30.15	29.475
6-Jan	3,478,800	24.46	23.82	30.25	29.552
7-Jan	4,050,900	25.2	24.11	29.95	29.558
8-Jan	3,267,100	24.76	24.17	30.12	29.716
9-Jan	9,008,600	27.43	25.8	31.42	30.04
10-Jan	4,895,400	27.67	26.85	31.2	30.285
13-Jan	7,687,000	29.45	27.81	30.72	30.492
14-Jan	4,684,000	28.86	28.01	30.7	30.562
15-Jan	4,276,000	28.5	27.56	29.89	30.551
16-Jan	3,273,000	28.78	27.96	30.19	30.459
17-Jan	3,679,300	28.61	27.53	29.67	30.411

e) Summary

Wal-Mart had its highest point in the beginning of the simulation which was followed by a downtrend. There was a short secondary uptrend, but eventually continued on the downtrend. Amazon.com also had its highest point in the beginning of the simulation followed by a downtrend. The amplitude of the downtrend was smaller than Wal-Mart's. Amazon.com had two secondary trends that countered the downtrend (head and shoulders top pattern mentioned in chapter 4). When we purchased Best Buy and

Target, Best Buy was on a small uptrend while Target was on a downtrend with a secondary uptrend toward the end of our simulation. These results followed similarly to the DJIA and NASDAQ indexes. Wal-Mart was the only company that produced a loss in our retail chain subgroup.

Retail store sales increased during the third quarter. Online retail store sales also increased. According to the government, the sales were the best year-over-year performance since the first quarter 2001. In its quarterly report on e-commerce trends, the Commerce Department said online sales increased by 7.8 percent to $11.06 billion from the previous quarter. Compared with the third quarter of 2001, sales jumped a hefty 34.3 percent, their largest year-over-year gain since the first three months of 2001, when sales rose 42.0 percent. This data is not adjusted for seasonal or holiday-related variations. Over the internet, sales increased from the previous quarter. The increased sales during the third quarter explain the highest points of Wal-Mart and Amazon.com at the beginning of our simulation (Reuters, WA 1). Amazon.com's stock increased in price because of its sales during the holiday season. Its fourth quarter report showed that its sales growth was at twenty-five percent. Amazon.com benefited from the last three months of 2002 during the holiday season. The weak United States economy during this time drove customers to seek better deals online (Stevenson 1).

Another article explained why there was a downtrend during the middle of our simulation. United States retailers lost nearly $500 million due to fraud and suspect transactions during the holiday season. This mainly affected online retail as customers who are suspect were rejected in buying goods online. Walmart.com, Amazon.com,

Target.com, and BestBuy.com suffered losses, but in our simulation, Wal-Mart was hit the hardest (Reuters, CT 1).

6.2.2 Toy Manufacturers

The toy manufacturers include Hasbro and Mattel.

a) Hasbro

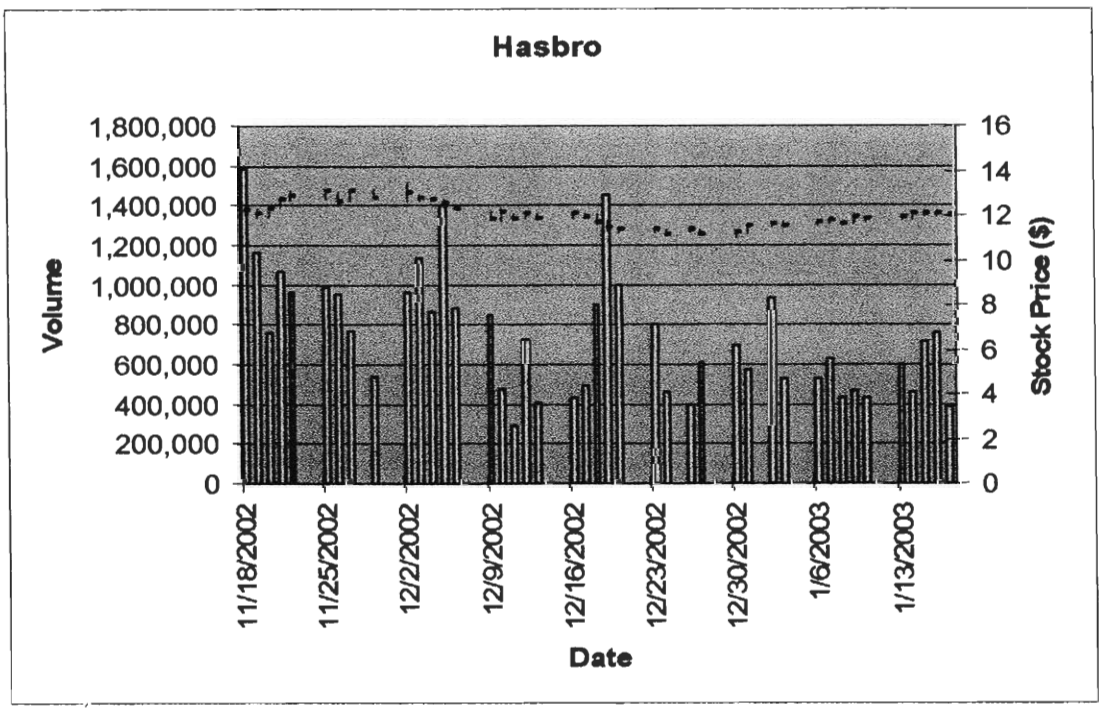


Fig. 6.21 Hasbro Vertical Line Chart with Volume

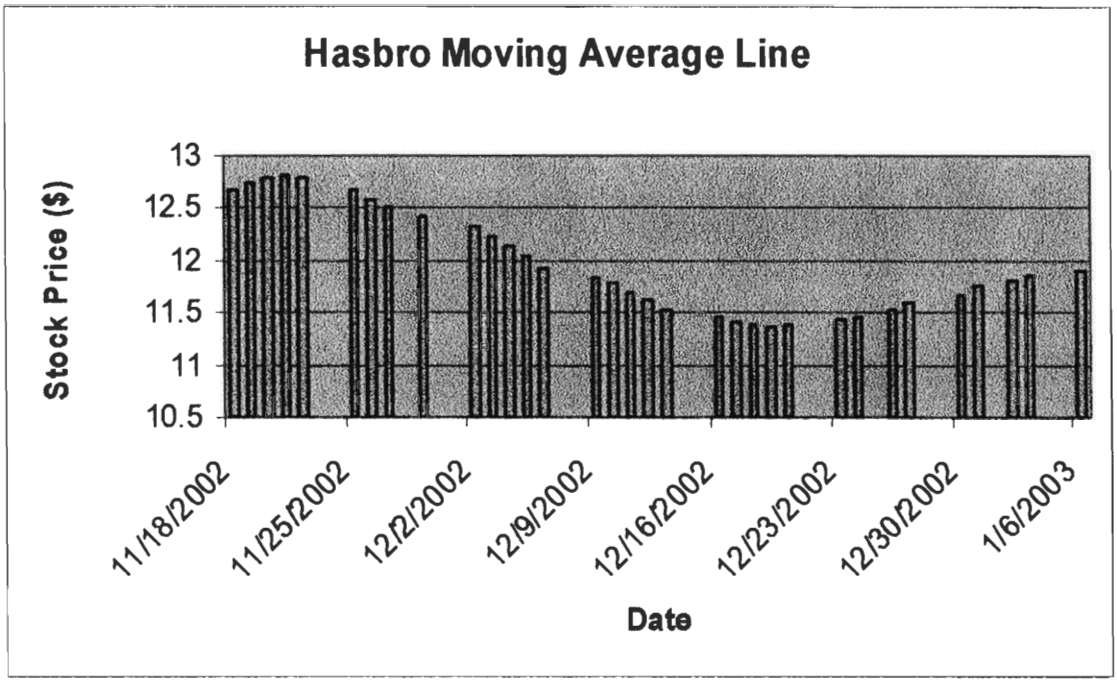


Fig. 6.22 Hasbro Moving Average Line

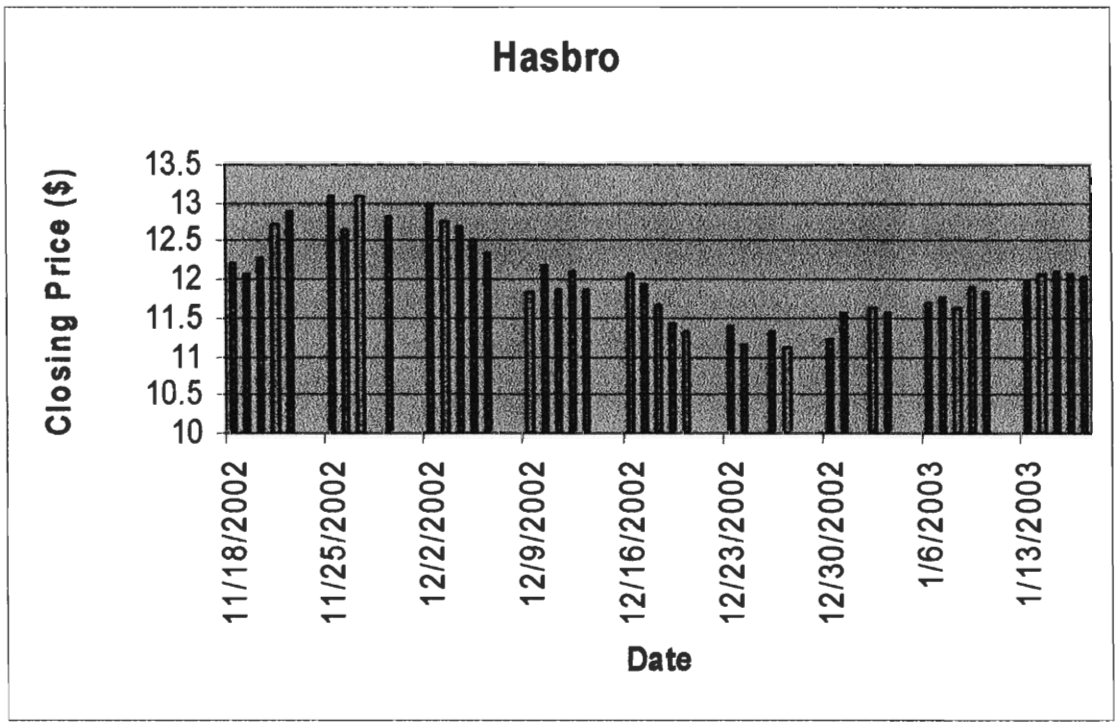


Fig 6.23 Hasbro Closing Price Graph

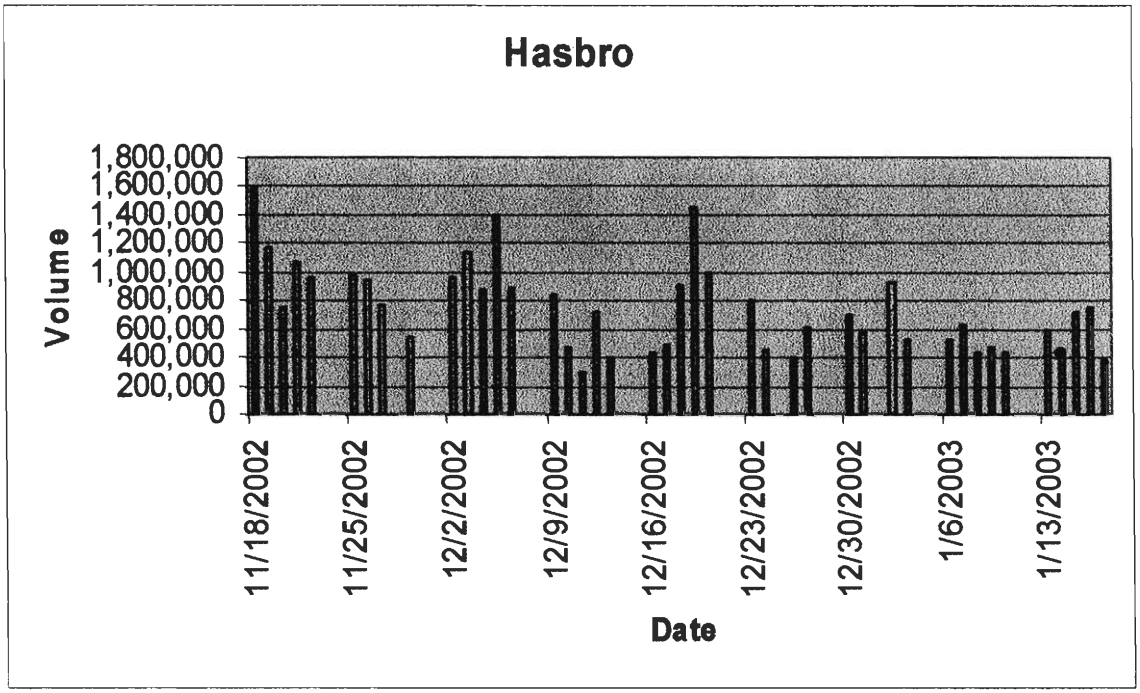


Fig. 6.24 Hasbro Volume Graph

Table 6.7 Hasbro Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
18-Nov	1,584,800	12.36	12.01	12.2	
19-Nov	1,166,000	12.33	11.9	12.07	
20-Nov	759,200	12.44	11.95	12.28	
21-Nov	1,071,200	12.84	12.38	12.72	
22-Nov	959,300	13.12	12.64	12.89	
25-Nov	984,100	13.1	12.67	13.08	
26-Nov	952,300	13.08	12.55	12.64	
27-Nov	769,600	13.11	12.6	13.08	
29-Nov	541,900	13.19	12.75	12.82	
2-Dec	963,700	13.48	12.65	13	12.678
3-Dec	1,141,900	12.93	12.6	12.76	12.734
4-Dec	866,700	12.8	12.6	12.69	12.796
5-Dec	1,404,500	12.8	12.39	12.51	12.819
6-Dec	884,900	12.5	12.22	12.33	12.78
9-Dec	843,700	12.23	11.8	11.83	12.674
10-Dec	475,500	12.16	11.68	12.16	12.582
11-Dec	293,000	12.07	11.86	11.86	12.504
12-Dec	721,300	12.16	11.83	12.11	12.407
13-Dec	409,000	12.1	11.86	11.87	12.312
16-Dec	429,500	12.12	11.83	12.07	12.219
17-Dec	491,700	12.11	11.92	11.94	12.137
18-Dec	903,300	12.08	11.56	11.68	12.036
19-Dec	1,455,100	11.75	11.3	11.42	11.927
20-Dec	1,000,100	11.52	11.21	11.34	11.828
23-Dec	804,400	11.54	11.21	11.4	11.785
24-Dec	455,500	11.4	11.02	11.14	11.683
26-Dec	399,300	11.45	11.19	11.34	11.631
27-Dec	607,700	11.36	11.1	11.12	11.532
30-Dec	700,200	11.31	11.01	11.21	11.466
31-Dec	575,800	11.61	11.17	11.55	11.414
2-Jan	934,000	11.69	11.42	11.62	11.382
3-Jan	528,800	11.73	11.48	11.55	11.369
6-Jan	525,600	11.76	11.56	11.7	11.397
7-Jan	629,300	11.9	11.63	11.77	11.44
8-Jan	429,800	11.69	11.51	11.63	11.463
9-Jan	466,600	11.91	11.63	11.9	11.539
10-Jan	434,500	11.95	11.71	11.85	11.59
13-Jan	598,500	12.01	11.74	11.96	11.674
14-Jan	456,600	12.07	11.79	12.07	11.76
15-Jan	716,100	12.1	11.89	12.1	11.815
16-Jan	756,200	12.13	11.95	12.07	11.86
17-Jan	386,600	12.09	11.92	12.03	11.908

b) Mattel

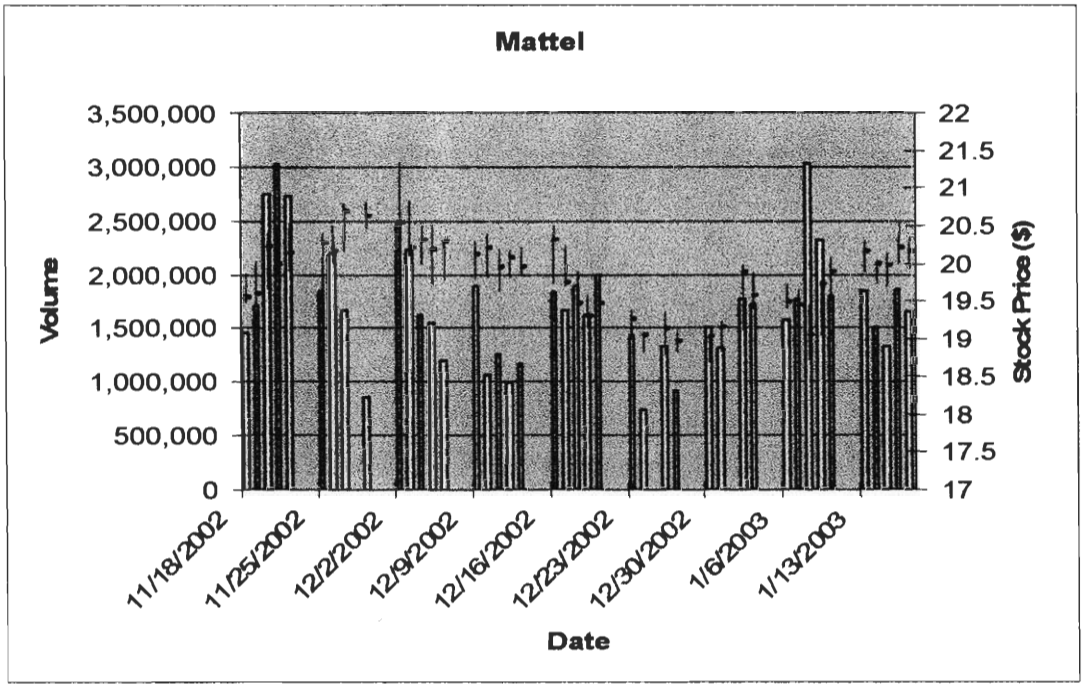


Fig. 6.25 Mattel Vertical Line Chart with Volume

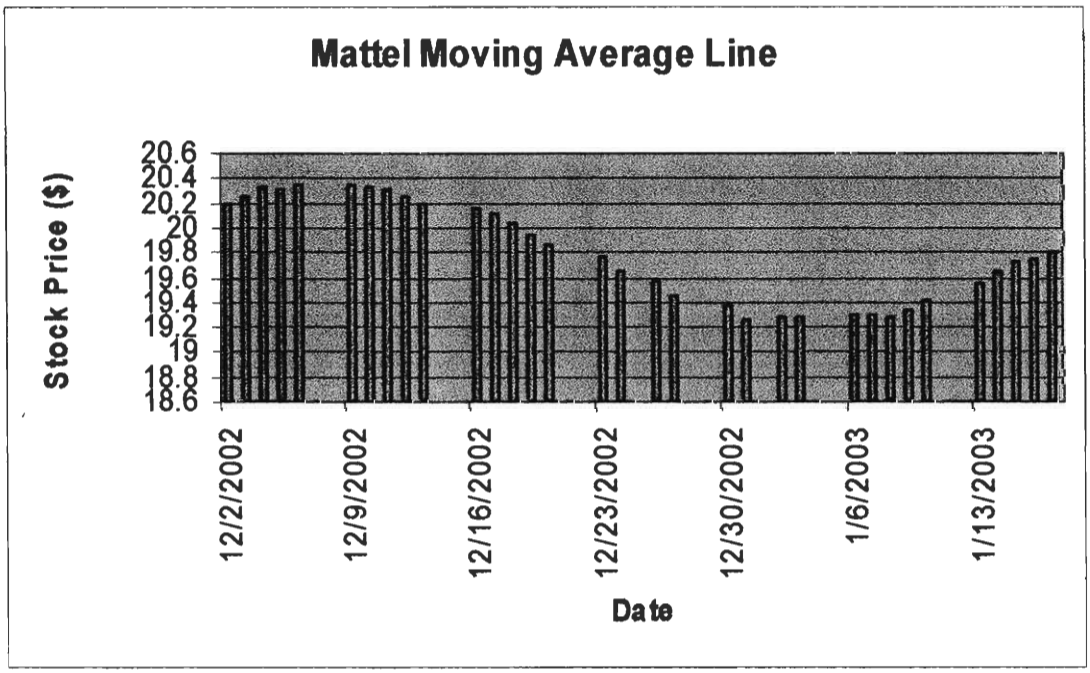


Fig. 6.26 Mattel Moving Average Line

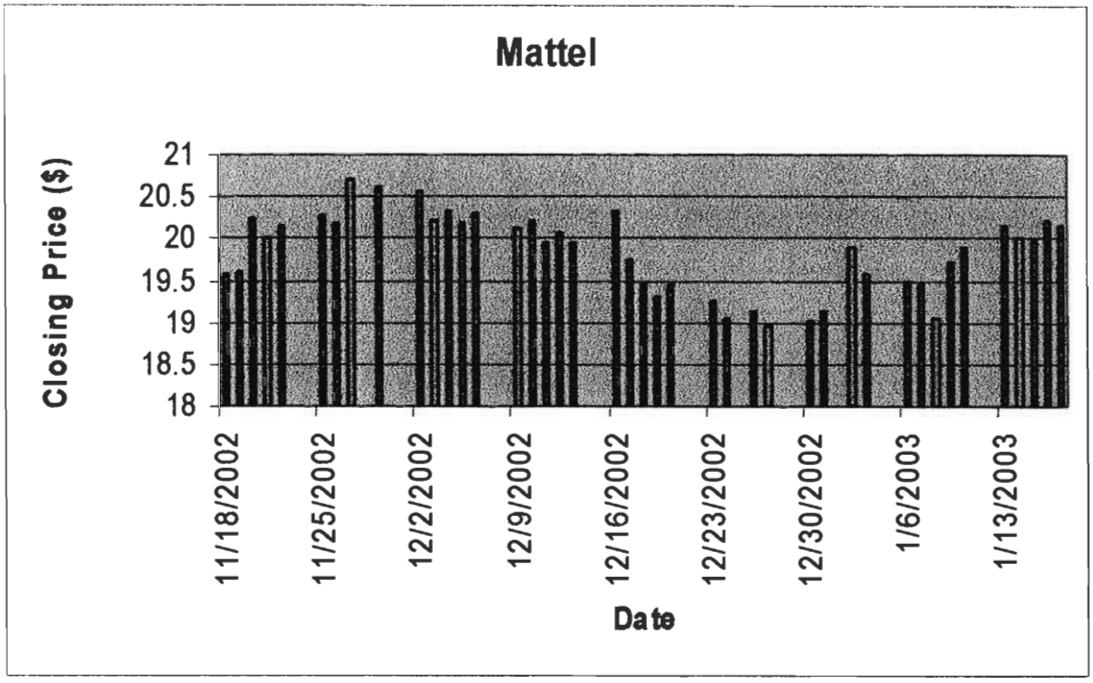


Fig. 6.27 Mattel Closing Price Graph

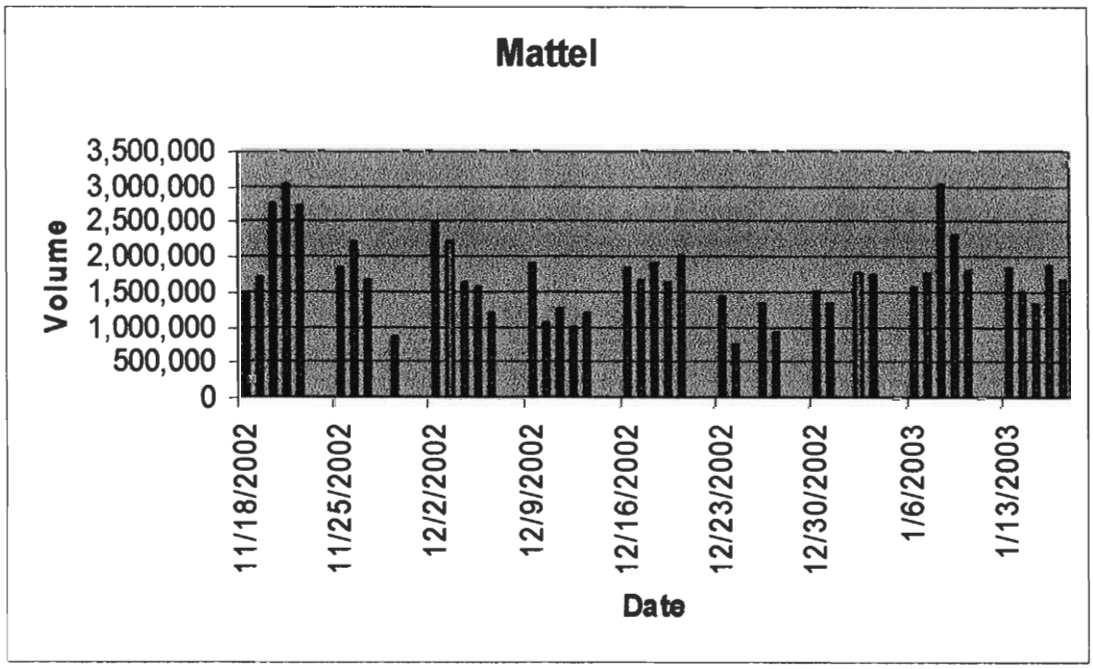


Fig. 6.28 Mattel Volume Graph

Table 6.8 Mattel Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
18-Nov	1,462,200	19.87	19.5	19.56	
19-Nov	1,713,100	20.03	19.45	19.6	
20-Nov	2,742,900	20.42	19.65	20.23	
21-Nov	3,029,800	20.5	19.87	20	
22-Nov	2,733,300	20.55	19.88	20.15	
25-Nov	1,840,600	20.4	19.65	20.28	
26-Nov	2,201,300	20.51	20	20.17	
27-Nov	1,672,600	20.79	20.17	20.7	
29-Nov	853,800	20.8	20.45	20.62	
2-Dec	2,478,700	21.35	20.42	20.55	20.186
3-Dec	2,224,800	20.85	20.1	20.2	20.25
4-Dec	1,622,400	20.5	20	20.32	20.322
5-Dec	1,553,000	20.5	19.75	20.19	20.318
6-Dec	1,195,300	20.29	19.78	20.29	20.347
9-Dec	1,892,300	20.3	19.8	20.12	20.344
10-Dec	1,056,000	20.4	19.83	20.21	20.337
11-Dec	1,259,700	20.18	19.62	19.95	20.315
12-Dec	983,800	20.18	19.81	20.08	20.253
13-Dec	1,173,200	20.22	19.82	19.95	20.186
16-Dec	1,827,800	20.5	19.75	20.32	20.163
17-Dec	1,675,900	20.23	19.69	19.74	20.117
18-Dec	1,894,000	19.89	19.47	19.47	20.032
19-Dec	1,624,500	19.57	19.15	19.3	19.943
20-Dec	1,998,100	19.47	18.99	19.47	19.861
23-Dec	1,438,800	19.38	19.02	19.25	19.774
24-Dec	733,000	19.08	18.82	19.04	19.657
26-Dec	1,325,000	19.37	18.8	19.13	19.575
27-Dec	916,100	19.12	18.81	18.97	19.464
30-Dec	1,511,100	19.04	18.67	19.02	19.371
31-Dec	1,308,800	19.24	18.83	19.15	19.254
2-Jan	1,768,500	20	19.1	19.9	19.27
3-Jan	1,727,100	19.9	19.4	19.57	19.28
6-Jan	1,574,900	19.73	19.4	19.5	19.3
7-Jan	1,775,600	19.65	19.35	19.45	19.298
8-Jan	3,033,600	19.44	18.7	19.05	19.278
9-Jan	2,312,100	19.77	19.05	19.72	19.346
10-Jan	1,798,900	20.08	19.52	19.9	19.423
13-Jan	1,843,700	20.32	19.9	20.16	19.542
14-Jan	1,501,200	20.04	19.73	20	19.64
15-Jan	1,321,800	20.14	19.71	19.97	19.722
16-Jan	1,867,900	20.56	20	20.2	19.752
17-Jan	1,652,500	20.36	19.93	20.16	19.811

c) Summary

Hasbro and Mattel were similar in their trends with that of NASDAQ and DJIA. They reached their peaks in the beginning of the simulation and then a downturn started. The downturn reached its nadir days before 2003 began and then an upturn started. The peak can be explained by the holiday season. The Day-After-Thanksgiving sale boosted retail purchases that include toys and games. The nadir can be explained by the end of the holiday season as toys and games are returned and purchases decrease. The upturn following the nadir can be explained by a return to normalcy. The holiday rush was over and consumers returned to their normal ways of shopping.

6.3 Technology Group

The following are the stock companies we categorized into the Technology group. These four companies are divided into two subgroups: computers & electronics and communications. Each subgroup is presented company by company with vertical line charts, moving average lines, closing price graphs, volume graphs, and data tables. Following the results is a summary which includes similarities and differences of the companies in the subgroup and explanations of the uptrends and downtrends.

6.3.1 Computers and Electronics

The computer & electronics companies are Dell and Hewlett Packard.

a) Dell

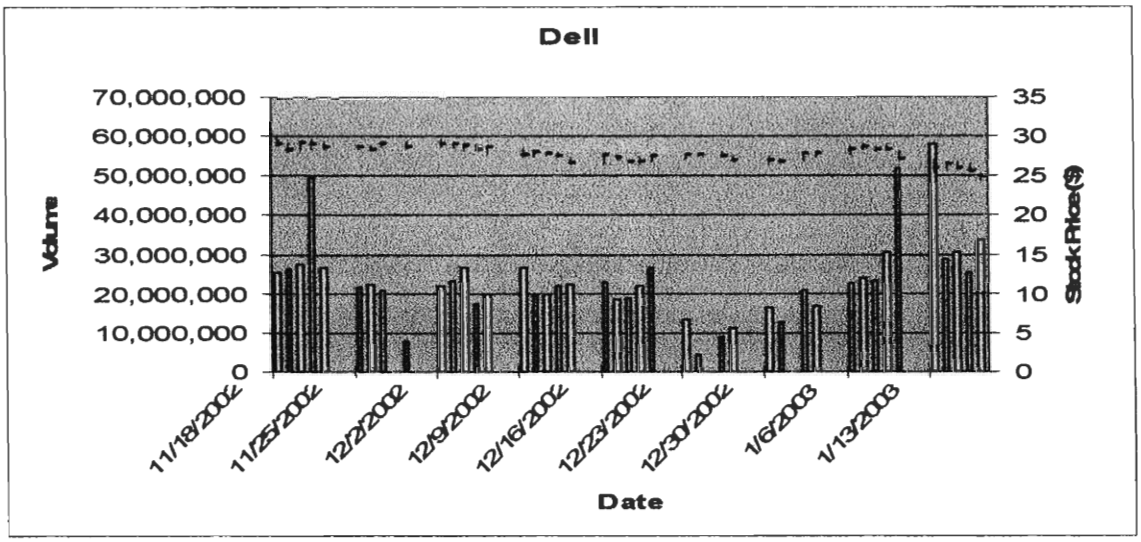


Fig. 6.29 Dell Vertical Line Chart with Volume

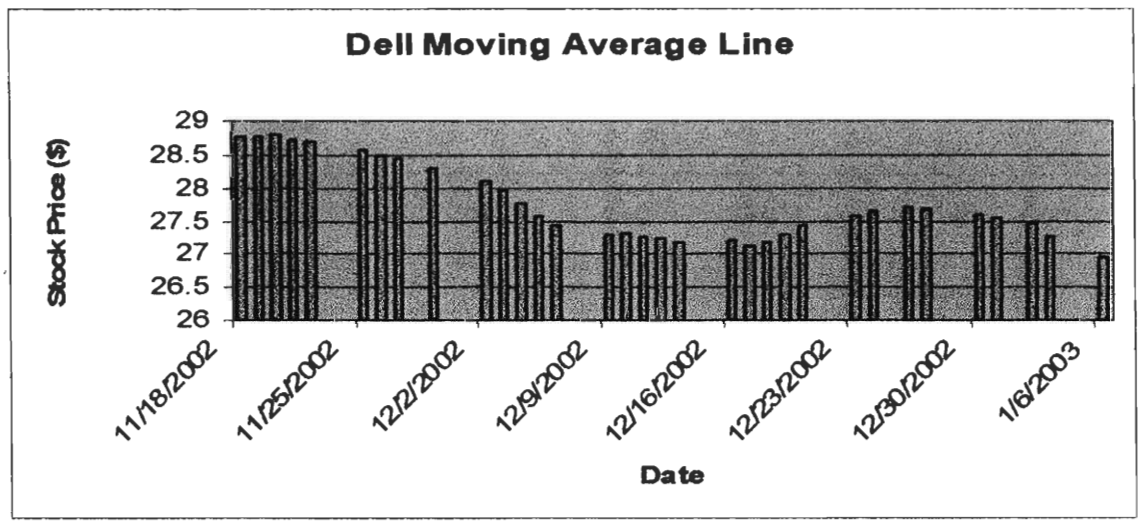


Fig. 6.30 Dell Moving Average Line

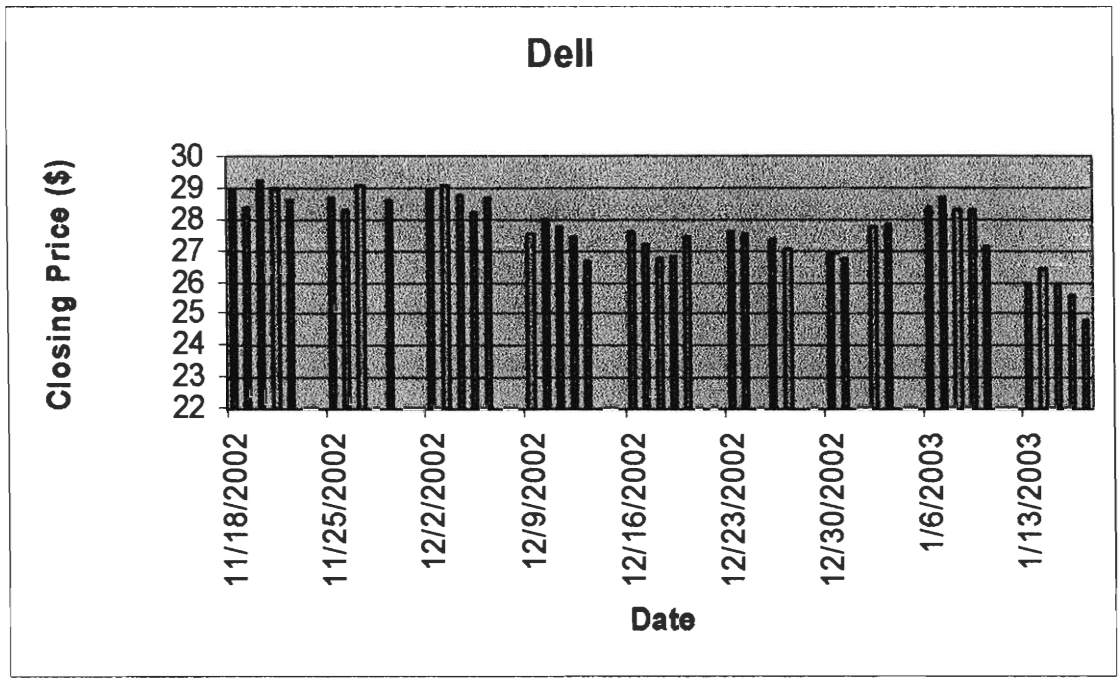


Fig. 6.31 Dell Closing Price Graph

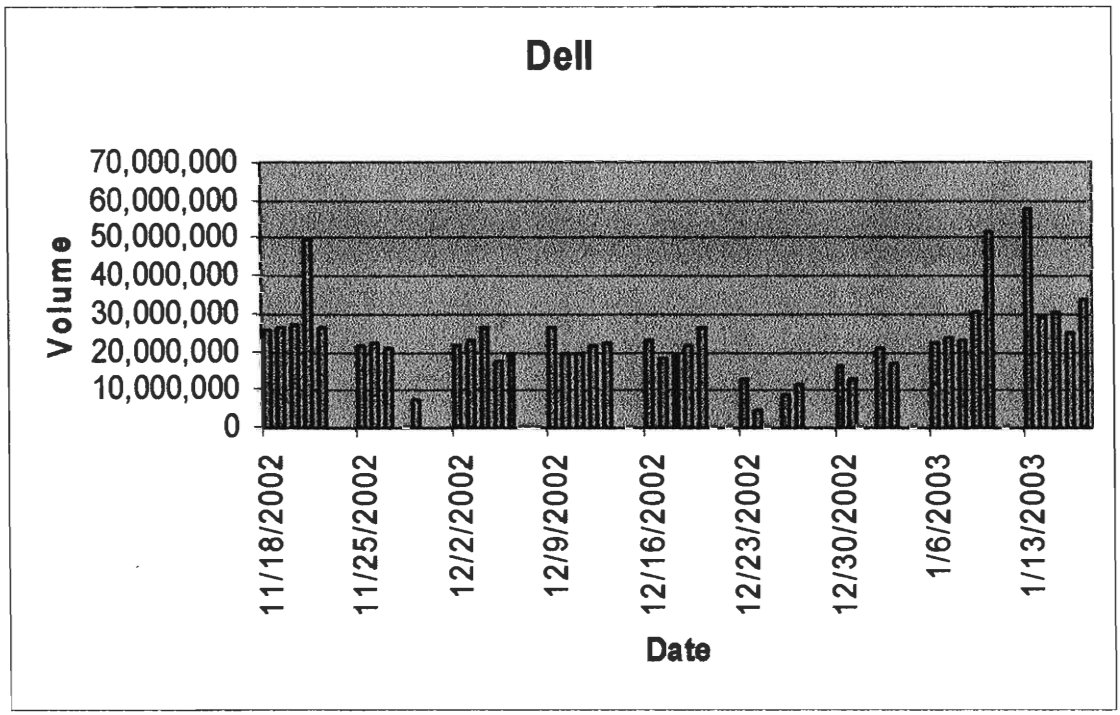


Fig. 6.32 Dell Volume Graph

Table 6.9 Dell Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
18-Nov	25,557,300	30.09	28.9	28.92	
19-Nov	26,475,099	29.21	28.01	28.34	
20-Nov	27,495,980	29.35	28.15	29.21	
21-Nov	49,501,662	29.71	28.38	28.98	
22-Nov	26,668,800	29.3	28.33	28.61	
25-Nov	21,693,500	28.84	28.23	28.67	
26-Nov	22,351,418	28.81	28.06	28.33	
27-Nov	20,909,356	29.38	28.58	29.03	
29-Nov	7,783,858	29.28	28.53	28.6	
2-Dec	21,866,100	29.64	28.71	28.93	28.762
3-Dec	23,355,255	29.39	28.55	29.05	28.775
4-Dec	26,777,540	29.21	28.1	28.75	28.816
5-Dec	17,606,944	28.93	28.16	28.25	28.72
6-Dec	19,767,087	28.86	27.75	28.65	28.687
9-Dec	26,816,262	28.43	27.35	27.54	28.58
10-Dec	19,601,466	28.24	27.35	27.95	28.508
11-Dec	19,955,890	27.97	27.39	27.75	28.45
12-Dec	21,939,073	28	27.21	27.43	28.29
13-Dec	22,469,464	27.34	26.6	26.63	28.093
16-Dec	23,051,842	27.63	26.46	27.56	27.956
17-Dec	18,562,745	27.56	27.05	27.22	27.773
18-Dec	18,923,864	26.86	26.51	26.72	27.57
19-Dec	22,028,690	27.38	26.36	26.8	27.425
20-Dec	26,667,917	27.59	26.72	27.4	27.3
23-Dec	13,247,978	27.68	27.18	27.58	27.304
24-Dec	4,551,154	27.74	27.45	27.54	27.263
26-Dec	8,844,522	27.91	27.21	27.39	27.227
27-Dec	11,457,481	27.45	26.83	27.02	27.186
30-Dec	16,302,355	27.39	26.5	26.9	27.213
31-Dec	12,807,858	27.11	26.51	26.74	27.131
2-Jan	20,805,034	27.84	26.8	27.71	27.18
3-Jan	16,817,856	27.84	27.23	27.79	27.287
6-Jan	22,711,208	28.7	27.7	28.35	27.442
7-Jan	24,115,944	28.98	28.36	28.65	27.567
8-Jan	23,405,423	28.52	28.04	28.32	27.641
9-Jan	30,546,509	29	28.1	28.3	27.717
10-Jan	51,957,799	28.14	26.98	27.15	27.693
13-Jan	58,007,693	27.09	25.43	25.98	27.589
14-Jan	28,968,937	26.6	25.73	26.4	27.539
15-Jan	30,706,178	26.85	25.71	25.96	27.461
16-Jan	25,319,162	26.59	25.35	25.6	27.25
17-Jan	33,740,229	25.13	24.29	24.83	26.954

b) Hewlett Packard

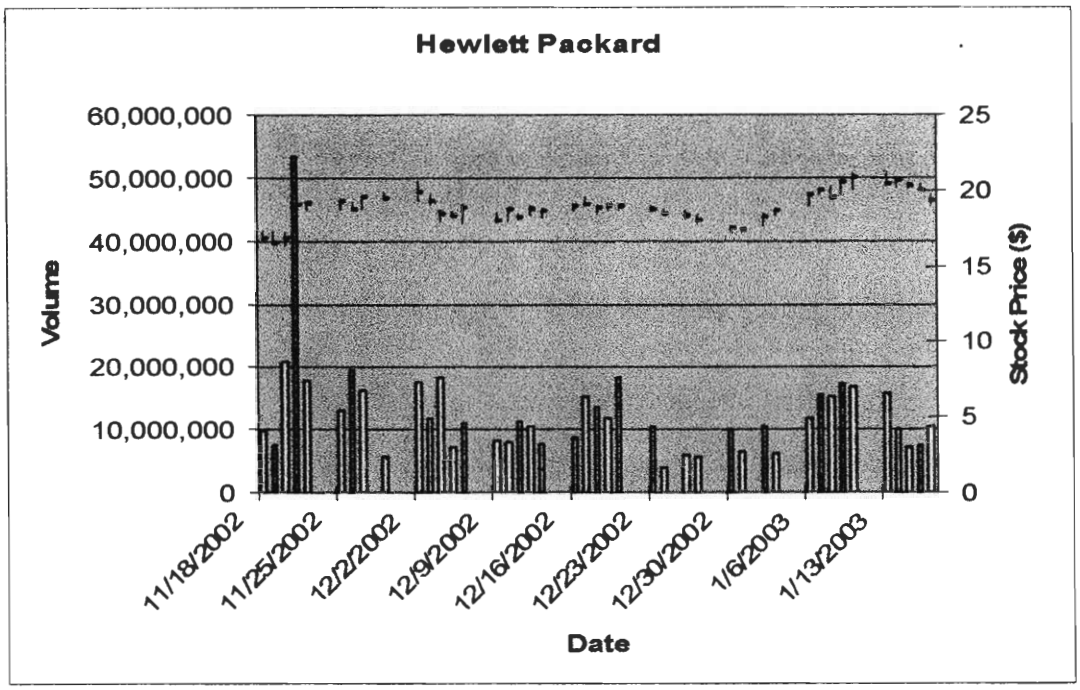


Fig. 6.33 Hewlett Packard Vertical Line Chart with Volume

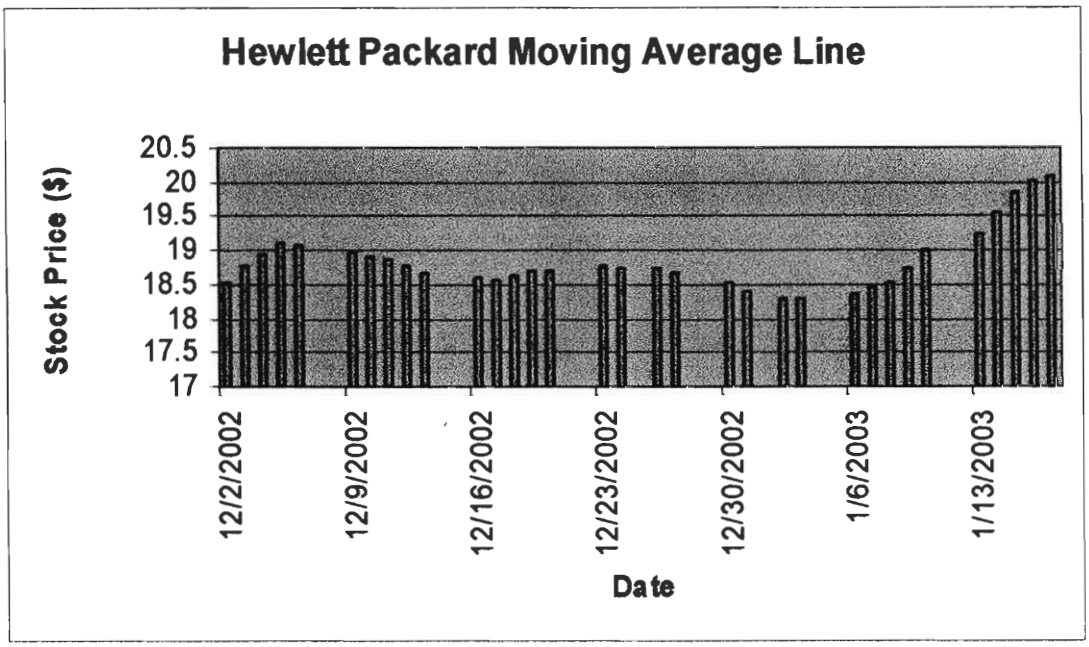


Fig. 6.34 Hewlett Packard Moving Average Line

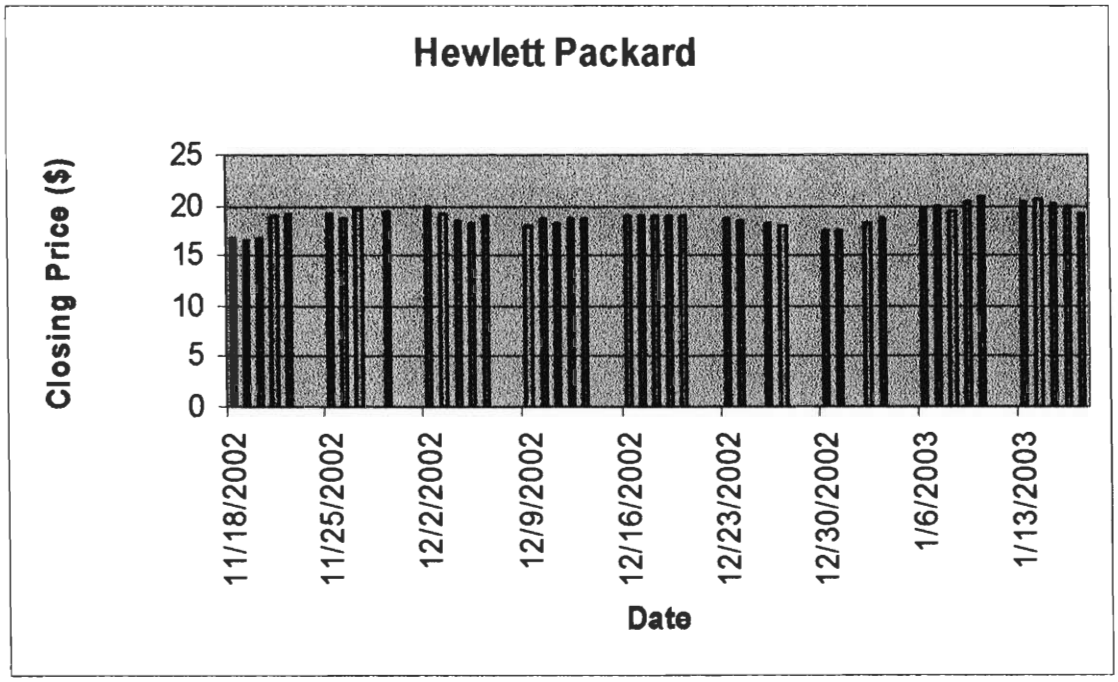


Fig. 6.35 Hewlett Packard Closing Price Graph

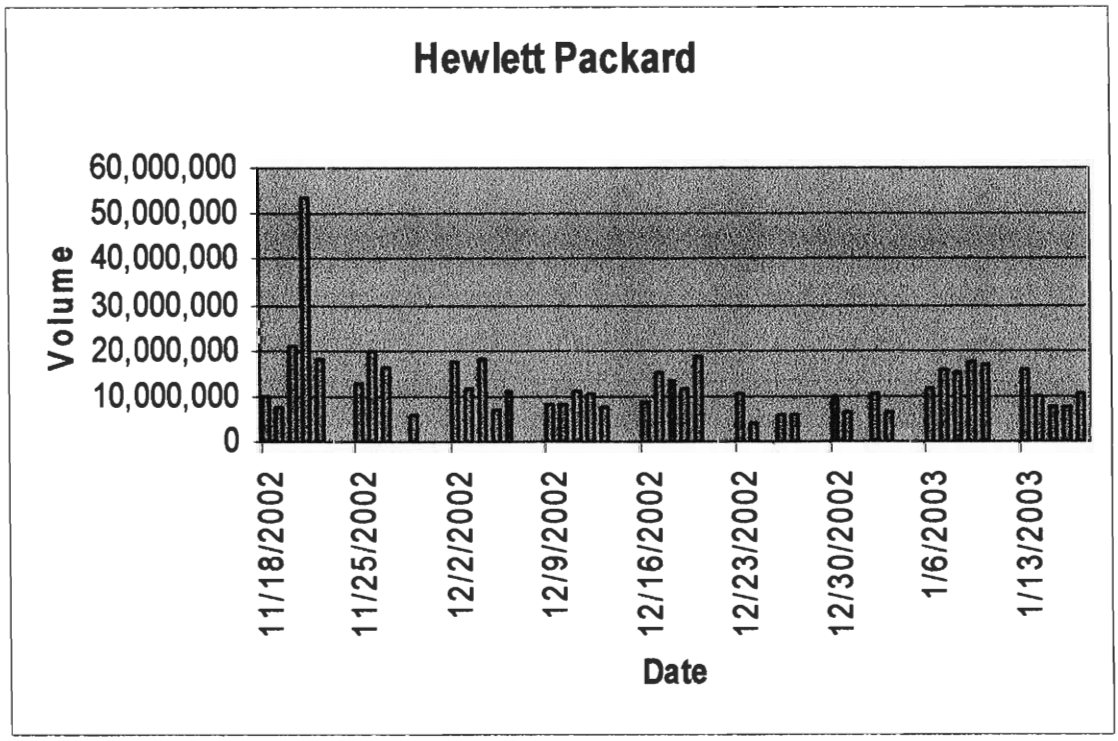


Fig. 6.36 Hewlett Packard Volume Graph

Table 6.10 Hewlett Packard Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
18-Nov	9,913,500	17.4	16.7	16.86	
19-Nov	7,416,600	17.28	16.42	16.55	
20-Nov	20,939,300	17.3	16.3	16.85	
21-Nov	53,533,900	19.48	18.32	18.99	
22-Nov	17,895,700	19.15	18.6	19.15	
25-Nov	13,063,200	19.43	18.75	19.29	
26-Nov	19,555,300	19.26	18.75	18.75	
27-Nov	16,256,300	19.71	18.75	19.59	
29-Nov	5,804,500	19.84	19.41	19.48	
2-Dec	17,498,200	20.64	19.2	19.83	18.534
3-Dec	11,838,500	19.8	19.05	19.23	18.771
4-Dec	18,207,000	18.74	17.88	18.37	18.953
5-Dec	7,243,700	18.62	18.21	18.26	19.094
6-Dec	11,083,400	19.1	17.8	18.83	19.078
9-Dec	8,266,900	18.55	17.84	18.03	18.966
10-Dec	7,930,600	18.8	18	18.68	18.905
11-Dec	11,328,300	18.49	18.05	18.23	18.853
12-Dec	10,479,500	19.04	18.3	18.76	18.77
13-Dec	7,805,900	18.79	18.25	18.58	18.68
16-Dec	8,910,700	19	18.65	18.95	18.592
17-Dec	15,323,000	19.55	18.95	18.99	18.568
18-Dec	13,604,300	18.99	18.37	18.85	18.616
19-Dec	11,677,200	19.15	18.62	18.95	18.685
20-Dec	18,438,400	19.01	18.68	18.91	18.693
23-Dec	10,471,700	19.03	18.64	18.68	18.758
24-Dec	3,950,400	18.74	18.33	18.42	18.732
26-Dec	5,961,900	18.75	18.1	18.29	18.738
27-Dec	5,765,200	18.44	17.75	17.94	18.656
30-Dec	10,060,400	17.69	17.17	17.44	18.542
31-Dec	6,418,800	17.48	17.18	17.36	18.383
2-Jan	10,457,000	18.55	17.58	18.2	18.304
3-Jan	6,197,800	18.75	18.26	18.57	18.276
6-Jan	11,861,500	19.92	18.91	19.65	18.346
7-Jan	15,566,600	20.19	19.62	19.95	18.45
8-Jan	15,424,500	20.28	19.5	19.5	18.532
9-Jan	17,294,800	20.66	19.7	20.48	18.738
10-Jan	16,846,800	21.08	20	20.85	18.994
13-Jan	15,865,400	21.2	20.31	20.36	19.236
14-Jan	10,024,100	20.67	20.15	20.6	19.552
15-Jan	7,396,300	20.6	20.05	20.25	19.841
16-Jan	7,554,600	20.41	19.95	19.99	20.02
17-Jan	10,574,300	19.73	18.93	19.23	20.086

c) Summary

Dell and Hewlett Packard were very dissimilar in their trends. Dell more closely resembled the DJIA and NASDAQ trends except that it did not turn around following the downtrend. Dell continued to plummet following a mediocre holiday season. Its stock price continued at a constant level in the beginning of the simulation, but crashed just before Christmas. It continued to do so after the holiday season and onto the new year. Dell did not produce strong enough sales during this period to garner a large profit. Hewlett Packard continued on a slow increase during our simulation. The secondary trends were at small magnitudes that did not last long. The teaming with America OnLine to integrate AOL Instant Messenger into its products may have increased sales of Hewlett Packard (Reuters, CA 1).

6.3.2 Communications

The communications companies are Verizon and AT&T Wireless.

a) Verizon

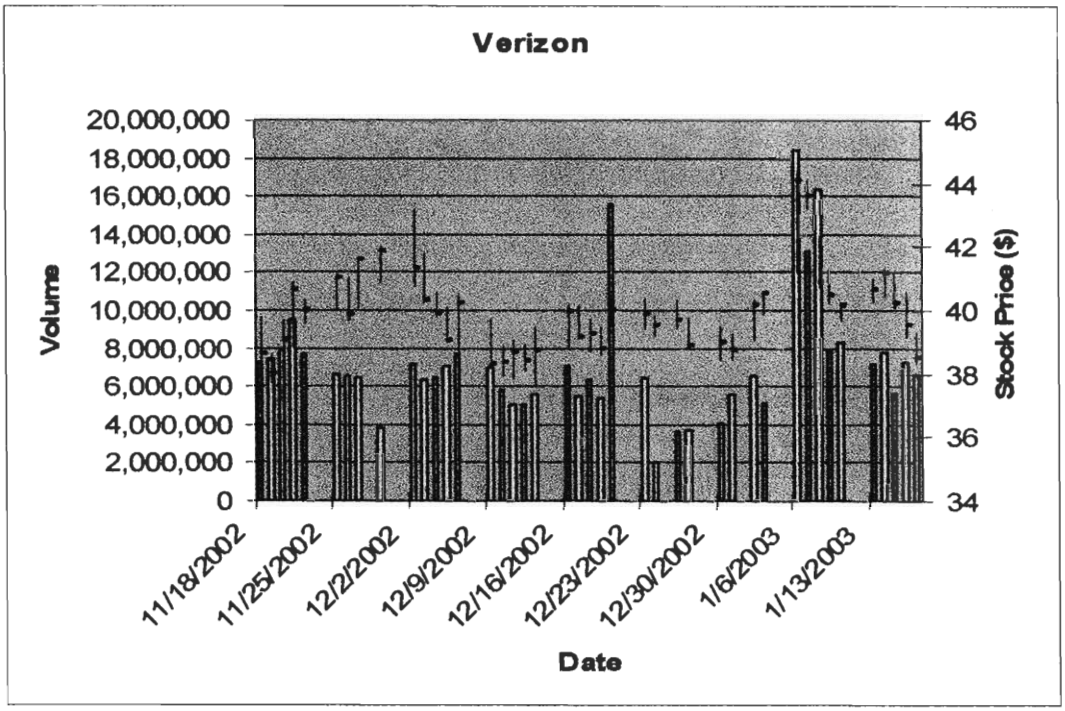


Fig. 6.37 Verizon Vertical Line Chart with Volume

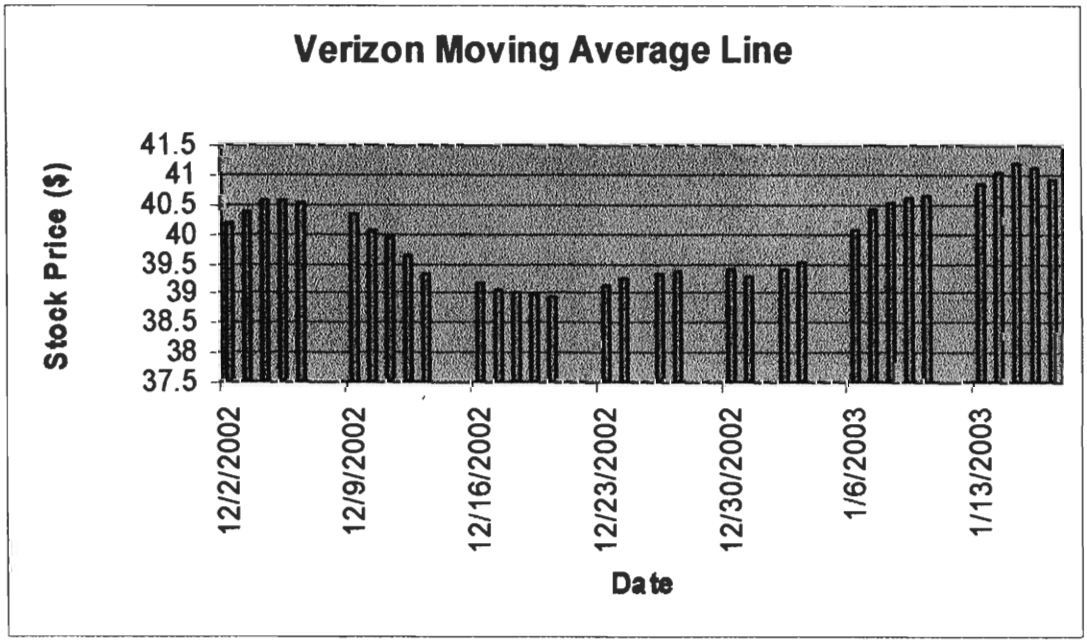


Fig. 6.38 Verizon Moving Average Line

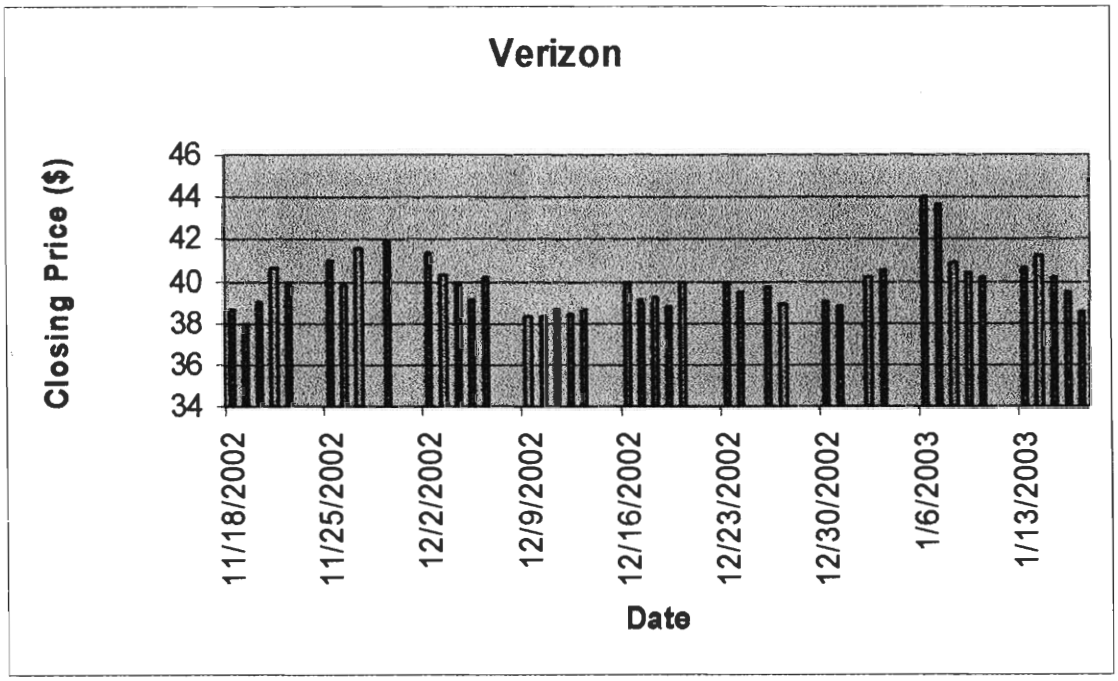


Fig. 6.39 Verizon Closing Price Graph

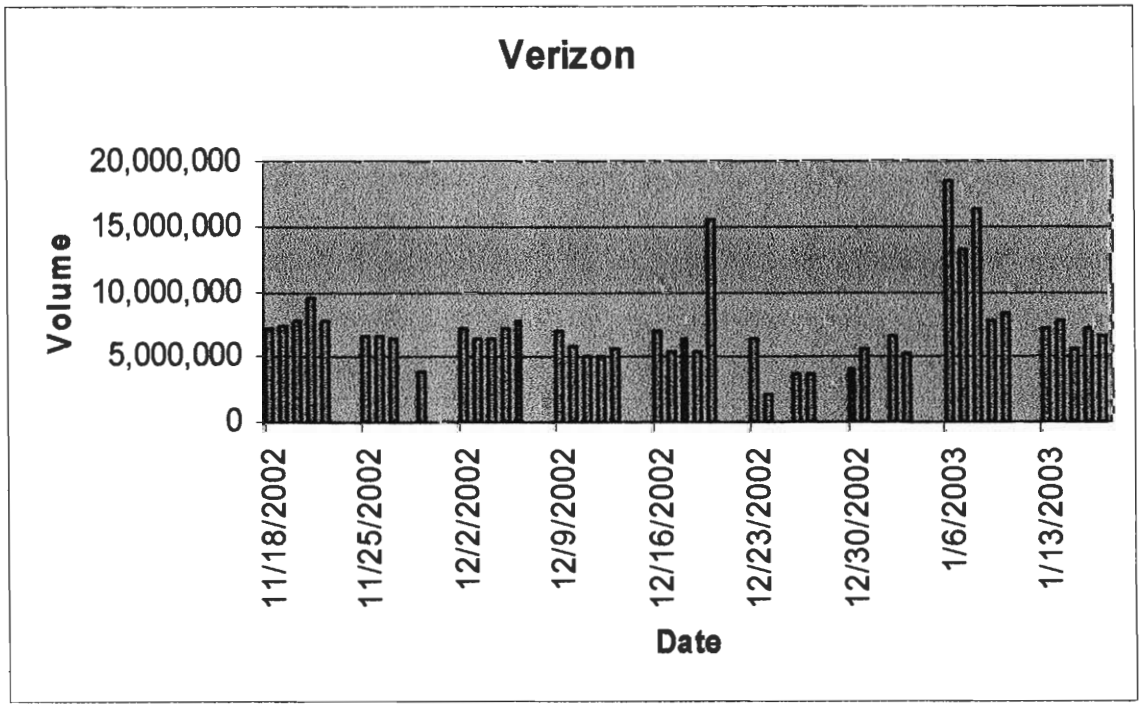


Fig. 6.40 Verizon Volume Graph

Table 6.11 Verizon Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
18-Nov	7,222,500	39.8	38.26	38.62	
19-Nov	7,461,300	38.62	37.74	37.99	
20-Nov	7,858,600	39.7	37.51	39.05	
21-Nov	9,499,800	40.89	38.76	40.64	
22-Nov	7,705,900	40.3	39.5	40	
25-Nov	6,636,500	41.09	40.01	41	
26-Nov	6,557,900	41	39.64	39.84	
27-Nov	6,442,600	41.72	40.05	41.57	
29-Nov	3,801,700	42	40.92	41.88	
2-Dec	7,143,100	43.2	40.73	41.35	40.194
3-Dec	6,363,300	41.8	40.2	40.33	40.365
4-Dec	6,444,500	40.6	39.81	39.92	40.558
5-Dec	7,120,100	40.1	39.01	39.07	40.56
6-Dec	7,697,600	40.52	38.27	40.19	40.515
9-Dec	6,976,300	39.76	38.23	38.3	40.345
10-Dec	5,852,200	38.9	37.85	38.35	40.08
11-Dec	5,054,900	39.07	37.81	38.65	39.961
12-Dec	5,016,600	38.95	38.07	38.4	39.644
13-Dec	5,593,100	39.49	37.66	38.7	39.326
16-Dec	7,076,200	40.15	38.85	39.94	39.185
17-Dec	5,464,700	40.15	39.09	39.16	39.068
18-Dec	6,385,600	39.75	38.66	39.25	39.001
19-Dec	5,388,200	39.45	38.57	38.79	38.973
20-Dec	15,532,100	40.3	39.45	40	38.954
23-Dec	6,493,200	40.36	39.43	39.9	39.114
24-Dec	2,050,200	39.85	39.15	39.5	39.229
26-Dec	3,650,600	40.32	39.42	39.69	39.333
27-Dec	3,676,600	39.8	38.76	38.9	39.383
30-Dec	4,033,200	39.45	38.4	38.98	39.411
31-Dec	5,586,100	39.24	38.42	38.75	39.292
2-Jan	6,559,700	40.3	39.07	40.17	39.393
3-Jan	5,166,900	40.54	39.86	40.54	39.522
6-Jan	18,405,700	44.31	41.18	44.07	40.05
7-Jan	13,111,600	44.07	43.2	43.62	40.412
8-Jan	16,346,100	42.35	40.7	40.91	40.513
9-Jan	7,851,300	41.33	40.22	40.46	40.609
10-Jan	8,293,000	40.29	39.65	40.14	40.654
13-Jan	7,129,700	40.99	40.23	40.65	40.829
14-Jan	7,761,100	41.35	40.4	41.18	41.049
15-Jan	5,688,200	41.21	40.04	40.19	41.193
16-Jan	7,225,600	40.6	39.15	39.52	41.128
17-Jan	6,679,800	39.3	38.28	38.5	40.924

b) AT&T Wireless

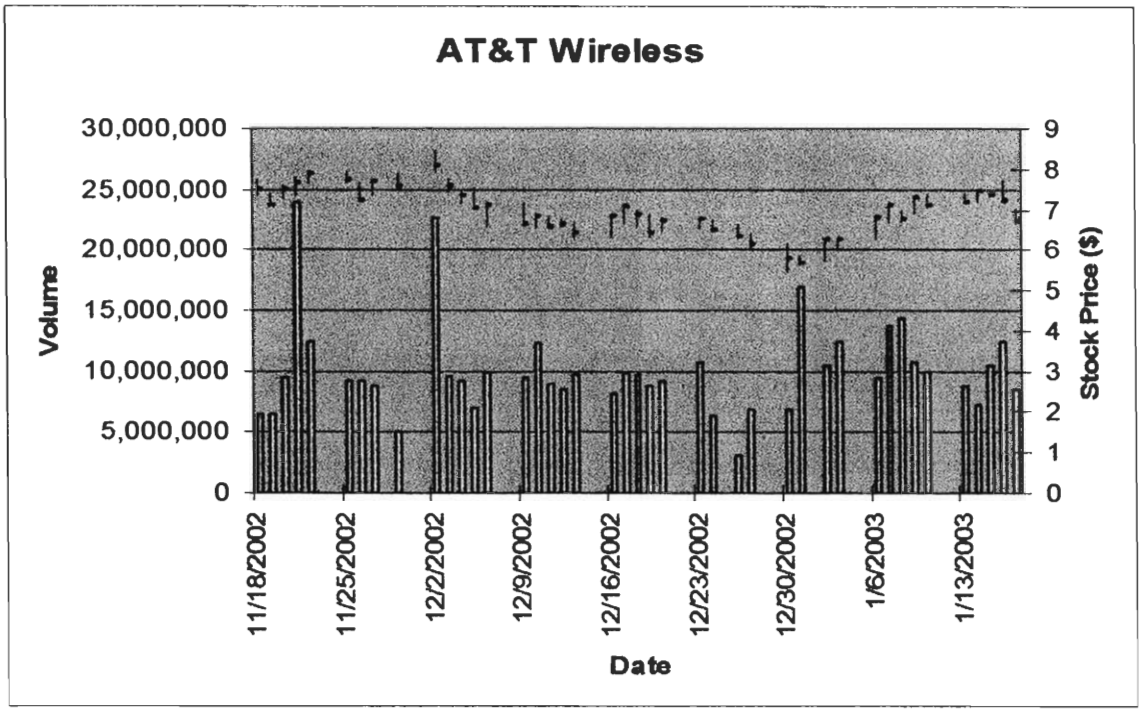


Fig. 6.41 AT&T Wireless Vertical Line Chart with Volume

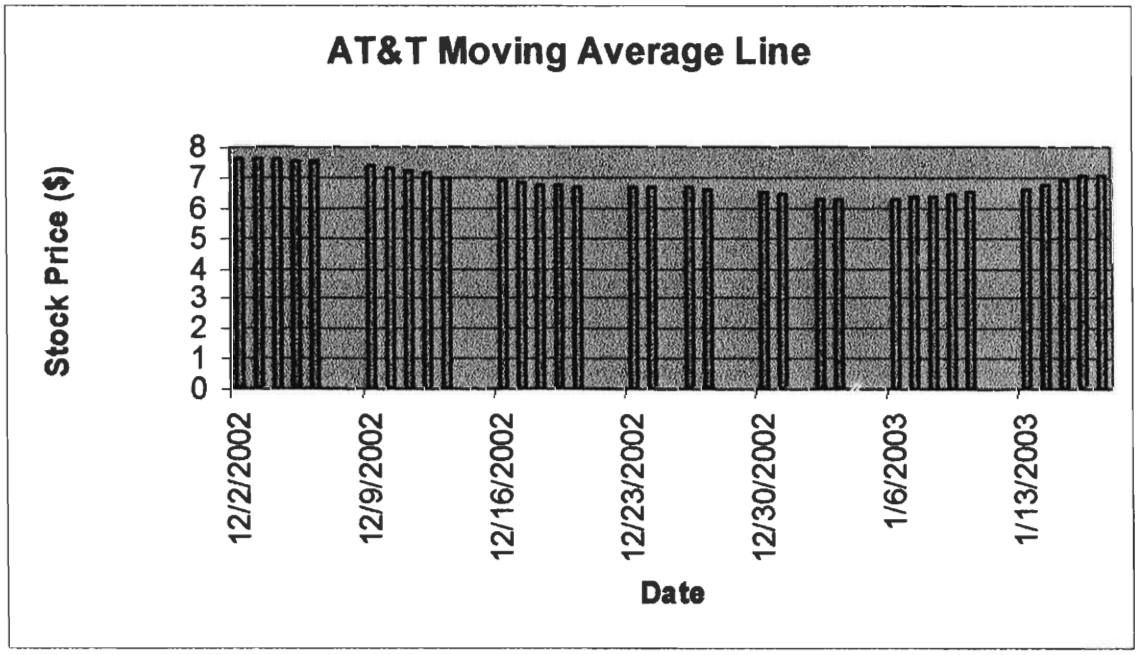


Fig. 6.42 AT&T Wireless Moving Average Line

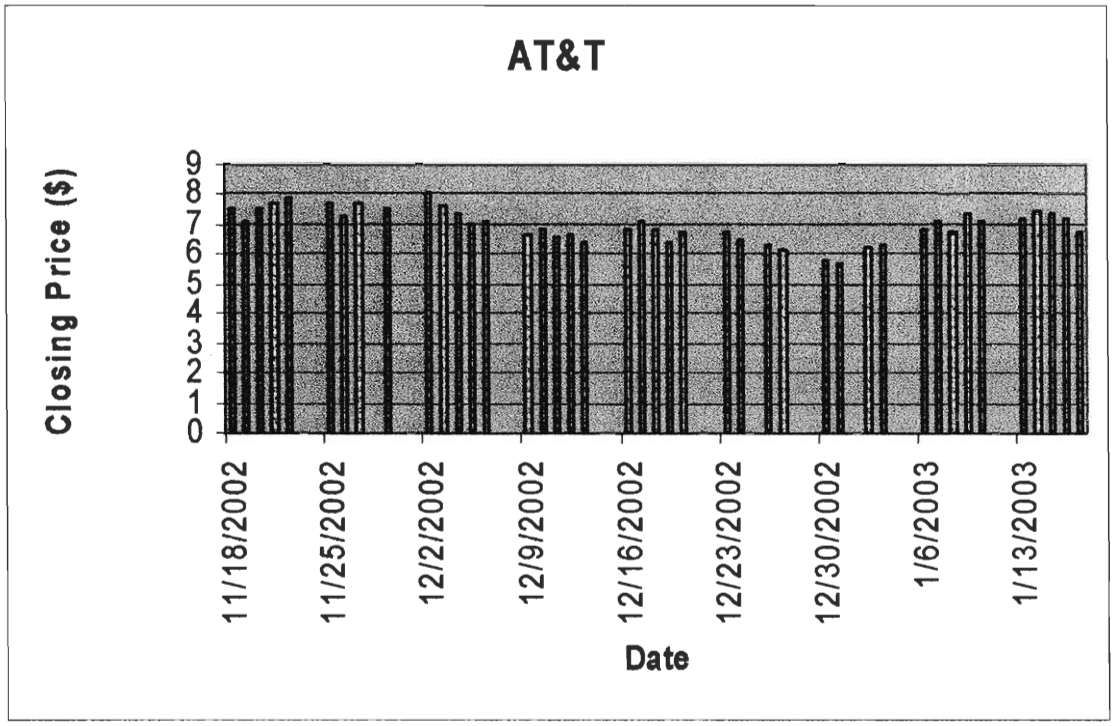


Fig. 6.43 AT&T Wireless Closing Price Graph

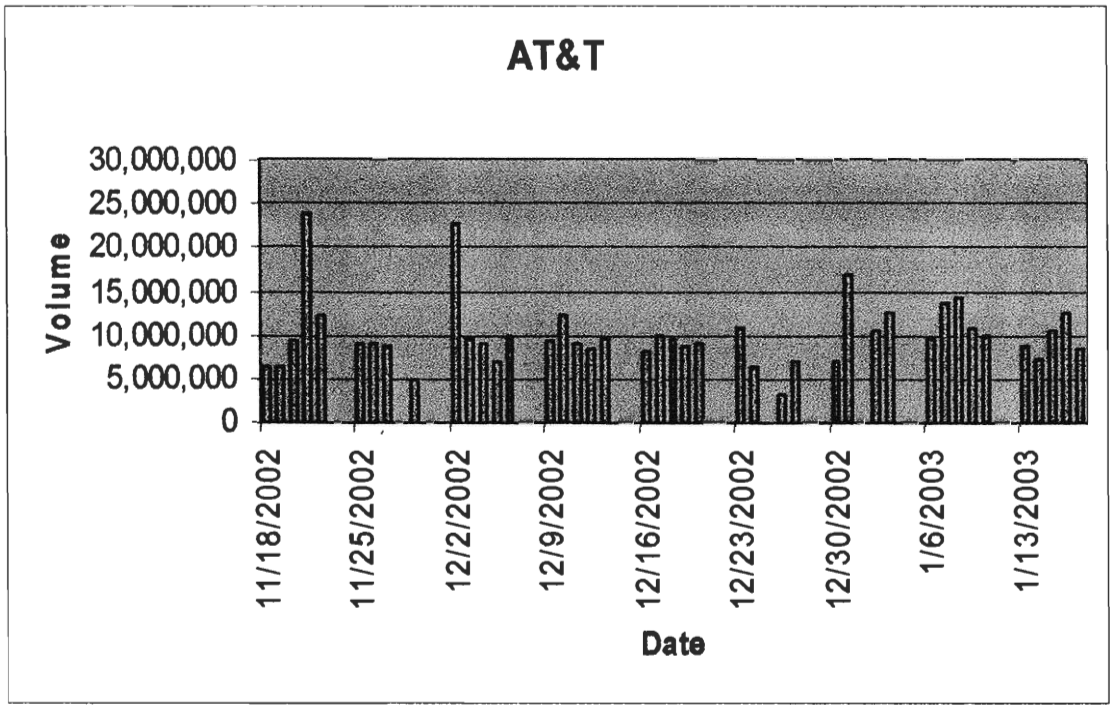


Fig. 6.44 AT&T Wireless Volume Graph

Table 6.12 AT&T Wireless Simulation Results

Date	Volume	High	Low	Close	Moving Avg.
18-Nov	6,513,200	7.75	7.32	7.48	
19-Nov	6,438,300	7.4	7.06	7.11	
20-Nov	9,411,700	7.59	7.25	7.5	
21-Nov	23,916,500	7.8	7.35	7.66	
22-Nov	12,352,200	7.94	7.6	7.89	
25-Nov	9,155,000	7.94	7.65	7.72	
26-Nov	9,157,300	7.7	7.2	7.22	
27-Nov	8,743,700	7.71	7.35	7.69	
29-Nov	5,067,000	7.86	7.5	7.55	
2-Dec	22,602,000	8.44	7.9	8.05	7.587
3-Dec	9,554,900	7.74	7.4	7.57	7.596
4-Dec	9,135,200	7.48	7.15	7.32	7.617
5-Dec	7,019,600	7.53	7.01	7.01	7.568
6-Dec	9,823,400	7.19	6.55	7.08	7.51
9-Dec	9,429,100	7.19	6.6	6.64	7.385
10-Dec	12,315,600	6.9	6.51	6.83	7.296
11-Dec	8,948,900	6.84	6.55	6.57	7.231
12-Dec	8,582,300	6.76	6.55	6.65	7.127
13-Dec	9,740,800	6.66	6.3	6.41	7.013
16-Dec	8,167,500	6.82	6.3	6.82	6.89
17-Dec	9,808,200	7.11	6.63	7.05	6.838
18-Dec	9,687,700	7	6.55	6.85	6.791
19-Dec	8,737,700	6.85	6.3	6.4	6.73
20-Dec	9,145,100	6.79	6.45	6.73	6.695
23-Dec	10,781,300	6.79	6.51	6.75	6.706
24-Dec	6,372,700	6.75	6.45	6.46	6.669
26-Dec	3,082,100	6.65	6.25	6.33	6.645
27-Dec	6,908,500	6.4	6.03	6.11	6.591
30-Dec	6,872,300	6.15	5.44	5.78	6.528
31-Dec	16,891,500	5.85	5.61	5.65	6.411
2-Jan	10,505,200	6.29	5.71	6.24	6.33
3-Jan	12,465,900	6.34	6.06	6.25	6.27
6-Jan	9,490,500	6.88	6.25	6.79	6.309
7-Jan	13,761,300	7.19	6.68	7.1	6.346
8-Jan	14,376,700	7	6.66	6.75	6.346
9-Jan	10,729,800	7.3	6.9	7.3	6.43
10-Jan	10,008,100	7.39	7.03	7.08	6.505
13-Jan	8,764,600	7.4	7.12	7.18	6.612
14-Jan	7,250,700	7.46	7.17	7.44	6.778
15-Jan	10,477,800	7.49	7.3	7.38	6.951
16-Jan	12,409,500	7.72	7.2	7.2	7.047
17-Jan	8,543,700	7.03	6.64	6.7	7.092

c) Summary

Verizon was the big winner of the portfolio during our simulation. Its price started on an upturn and its secondary downturns did not negate the profit from the upturn. The price of Verizon continued to increase during our simulation at a slow rate. AT&T, however, slowly decreased in price during our simulation. There were a few secondary trends, but they were small. The uptrend at the end may have resulted from AT&T's services with its new technology in text messaging. Verizon succeeded with its campaign on better services allowing customers to have three services (long distance, wireless communication, and broadband internet) in one package.

6.4 Conclusion

This chapter presented our results and data from our stock market simulation. This included two indexes and the ten companies in our portfolio. Our results included vertical line charts, moving average lines, closing price graphs, trading volume graphs, and data tables. We explained why upturns and downturns happened through world and business events and we compared the trends to the indexes.

The next chapter will discuss briefly how the stock market was affected by society and how society was affected by the stock market based on our simulation. It will then present the knowledge we gained by doing this IQP and our conclusion.

Chapter 7:

Conclusion: Effects

The previous chapter presented our stock market simulation results. Based on our simulation, this chapter will present the effects of society upon the stock market and vice versa. We will describe the Efficient Market Theory, describe how supply and demand in economics and events affect prices and present a stock flow chart, and describe how panics and crashes affect society. Finally, we will present our conclusion. The conclusion will include what we learned from this IQP and a summary of the important information on our project.

7.1 Efficient Market Theory

The Efficient Market Theory describes one way that society affects the stock market. It describes how stocks are efficiently priced to reflect all available market information because millions of investors having access to the same information will quickly adjust the price to the facts. Stocks will sell for what they are worth. The market anticipates changes in earnings, dividends, etc. If there is a change in the earnings or dividends that surprises investors, the move in the stock is quickly over with making it difficult to take advantage of. There is some predictability in the stock movement. Stocks that are sold heavily by insiders usually decline in price before the announcement is made

and continue the decline for a few months. Stocks bought by insiders tend to outperform the market (Lorie 55)

However, the market is not always efficient in calculating stock prices. There is inefficiency in the market dealing with secondary stock offerings. A secondary stock offering is made by an investor who has had a close relationship to the business such as a venture capital firm that helped with early financing. The inefficiency occurs when poor market performances follow strong ones. Inside trading is also inefficient. Insider trading, whether in the market in modest amounts or as secondary blocks subject to registration requirements are illegal, have to be reported, and are subject to legal restrictions. Insiders are not allowed to take advantage of material information. For example, if people knew that a tender offer was going to be made for a stock, they would be breaking the law if they bought the stock in advance before the announcement was made, no matter how they acquired the information. Another inefficiency in the market is having privileged positions of stock exchange members. They have access to information on sell orders overhanging the market and buy orders under the market. Their actions are reported, but not until two weeks or so after the event.

Major investment opportunities lie in these inefficiencies. The ability of the market participants to evaluate prospects of a company and to reach a sensible conclusion about the stock's value is inconsistent. These inefficiencies make it difficult to keep stock pricing consistent. However, these efficiencies and inefficiencies in society affect the stock prices greatly (Lorie 65).

7.2 How Society Affects the Market

Efficiencies are not the only contributor in society that affects the market. According to the fundamental approach, world events, business activities, and company activities change the outlook of the stock market. The economy is also a factor in the prices of stocks. An individual stock's price changes because the stock market itself goes up or down. If the stock market falls because of bad news, then most stocks fall. If the stock market rises because of good news, then most stocks rise. However, unique news only affects few stocks. During our simulation, news of a war possibility affected the market. As previously mentioned in the previous chapter, when news of a possible UN resolution to the Iraq situation was nearing, the DJIA and NASDAQ reached high levels. However, when news that a resolution was going to take more time, war worries emerged and stocks plummeted.

Some fundamentalists believe there are two factors involved in stock prices: the market itself and the component stock company. If the market and component go up, then the price goes up. If the market and component go down, then the price goes down. However if the market and component go in different directions, it is hard to predict what will happen to the stock (Crowell 50). In our simulation, when the indexes went up (market) and sales increased for the companies (component) the stock price went up. This happened during the holiday season. When the indexes went down and sales decreased, the price went down. This happened after the holiday season in the end of December and beginning of January. However, with certain companies that did not follow the indexes such as Hewlett Packard, the stock price was hard to justify.

Other fundamentalists believe there are three factors involved in the movement of stock prices: a) general market, b) industry factors, and c) company related information. The stock prices move up and down with these factors and include the categories of railroads and metals. However, some stock categories like tobacco, utilities, and retail stores do not move closely with the market. These factors rely on the time period (Lorie 22). These three factors (explained below) are similar to the previously mentioned two factor belief. Sometimes, these beliefs are inconsistent. In our simulation, our retail store chains moved closely with the market.

The market factor is important to follow. It gives prospects for the economy. Analyzing the market leads to important questions. Where do the leading indicators point to? How will the financial factors like interest rates and money supply develop? What are the social and political trends? The market gives an outlook for the free enterprise system in the United States and the rest of the world.

The industry factors are also important to consider. Analyzing the industry leads to an important question as well. What is likely to happen to special factors affecting the industry's profitability? For example, interest rates are critical for the building industry and oil prices are important for the energy group.

The company information needs to be analyzed. In the industry, is the company losing or gaining in competition? How fast do the earnings grow? Are the finances strong? Are there any company problems like labor troubles, antitrust, regulatory or special problems?

The market and real economy relate to each other because they move together in cyclical patterns. The market is an economic indicator. Changes in the market precede changes in the economy by an average of four months. The relationship between the market and economy provide details on the factors that determine price levels. Three determinants of price levels are the expected level of earnings (weighted average), the degree of investor uncertainty in estimating what future earnings will be, and the rate at which a prospective stream of certain earnings is discounted to determine its present value. The present value is affected by the rate at which it is discounted - the higher the rate, the lower the value (Lorie 2).

Supply and demand in economics also affect the market. One reason for a market's behavior prior to an economic downturn is that investors believe a downturn may become a depression. A pattern can be drawn (see second stock flow chart in appendices). As a recession ends, the economy grows. The growth feeds on itself and prosperity emerges. Prosperity continues to expand to other communities and soon, demand for goods and services increase. One example is housing. Demands for housing increase which result in demand for building materials and labor. This provides more jobs, and higher employment means more income. More income means more demand for products and services. More demand means more expenditures, income, and demand. Eventually, demand exceeds supply since production cannot keep up. This leads to shortages, and companies order in advance to meet the demands. This excess demand puts pressure on prices, and inflation occurs. The government tries to slow down the economy until supply meets demand. It tries taxes which lead to more expensive goods and services which slow down demand. However, during this time, someone in the chain

stops buying causing sales to decrease and inventories to increase. As profits and sales lessen, unemployment increases. The company needs to cut its prices and workers and the downturn happens.

7.3 How the Market Affects Society

Another relationship between the economy and market is the money supply. The changes in the money supply predict changes in both economic conditions and stock prices. Three observations can be made from the money supply: (Lorie 6)

1) Changes in the money supply growth rate have a "usually decisive" effect on business conditions and stock prices.
2) Competent monetary analysis can detect relevant changes in monetary policy by reviewing Federal Reserve Board policy statements and by analyzing current changes in the money supply and other monetary statistics.
3) Understanding the relationship between the money stock and the real economy can contribute to solving the timing problem (when to invest funds in or withdraw funds from the market), but finding the solution will continue to be difficult, and its value may diminish if cyclical fluctuations in stock prices diminish.

Stock price changes result from monetary variable changes i.e. monetary changes lead stock prices.

The stock market in microeconomics is known to be a bubble. A bubble is a volatile system that may pop at any time. The stock market is known to have panics and crashes that worry society. Other times it has jumps which excite society. The first panic was in 1857. Collapse of the Ohio Life Insurance & Trust Company precipitated the Panic of 1857. Prices dropped eight to ten percent in the course of a single trading session, the culmination of a 45% decline in market value since the beginning of the year. This caused people to panic as the market dropped. It caused chaos when investors tried to buy before prices rose again or sell before prices further sank. Another panic happened in 1907. Rumors of financial problems at Knickerbocker Trust, a leading New York bank, triggered a run on banks throughout the city. This began the Panic of 1907, regarded as America's most severe financial crisis to date. The panic was stemmed almost single handedly by J.P. Morgan, Sr., who orchestrated a massive operation to infuse cash into banks and shore up the stock market.

Other occurrences in the market make society either rejoice or worry. For example, news of index levels can easily excite society. On March 16, 2000, the DJIA experienced its largest one-day gain - 499.19 points - to close at 10,630.60. Many investors were ecstatic. However, their feelings changed a month later when on April 14, 2000, the DJIA plummeted 617.78 points, closing at 10,305.77 - its steepest decline in a single day. As mentioned in the previous chapter, rejoicing helps consumers enter a buying mood which in turn helps companies grow in sales. This can lead to an upturn. However, worries can threaten sales which may lead to a downturn (NYSE 1).

7.4 Project Conclusion

Our IQP described the stock market. We described the history and background information of the stock market and some strategies that analysts developed. We took these strategies and interacted with the market through a simulation. From the simulation, we gathered information about the effectiveness of the strategies and about how the market affected society and vice versa.

Chapter 1 described our objectives, plans, and structure of the project. Our objectives included educational value, the testing of strategies, and the effects of the stock market. Our educational value objective consisted of learning the background information of the stock market and to present it in our project. This would help us understand the market. Our testing of strategies objective followed our research of different strategies. We wanted to test certain strategies in a simulation. Our effects of the stock market objective followed from the results of the simulation. We were able to see how the market was affected from events during our simulation.

Chapter 2 described the background information of the stock market. This included the history of the New York Stock Exchange, American Stock Exchange, and Wall Street. This chapter also included methods of how stocks are valued: value weighting and equal weighting. Finally, information on important indexes was given. We followed two of these indexes during our simulation, the DJIA and NASDAQ.

Chapter 3 described how to get started in the market. This included sources of information, common terms to know, how the floor works in the exchanges, stock categories, and information on portfolios. Sources of information included internet sites

and periodicals such as the *Wall Street Transcript*. Common terms included words that were described in our project such as dividends, stocks, and volume. These are important to know when investing. We described how trading works in the NYSE, from the investor's order to the confirmation of that order. The hidden details of how the order is managed were given. The stock categories were listed: Basic, Consumer, Technology, Energy, Interest Sensitive, Inflation Beneficiaries, and Miscellaneous. Finally, details on what a portfolio and where to manage one were given.

Chapter 4 described some strategies. This included three approaches, each with its own strategies. The technical approach deals with the market itself and includes strategies like Dow's Theory, Moving Average Line, and Trading Volume method. The fundamental approach deals with statistics and includes strategies like Vertical Line Chart, buy and sell tactics, and 80:20 Theory. The random walk approach deals with the volatility of the market and includes strategies like risk and speculation. The final section of this chapter included stock selection methods. This described three stock types: value, growth, and hot stocks.

Chapter 5 described our simulation. This included background information on our portfolio companies: Wal-Mart, Amazon.com, Target, Best Buy, Verizon, AT&T Wireless, Dell, Hewlett Packard, Hasbro, and Mattel. We then described our simulation and the strategies we used: Dow's Theory, Moving Average Line, Trading Volume, Vertical Line Chart, and speculation. We also explained the reasons for our transactions.

Chapter 6 described our simulation results. This included Vertical Line Charts, Moving Average Lines, and data tables of the DJIA and NASDAQ indexes; and Vertical Line Charts, Moving Average Lines, closing price graphs, trading volume graphs, and

data tables of the companies in our portfolio. We analyzed our results and explained why these results happened through world events and company activities.

Chapter 7 described the effects of the stock market upon society and vice versa. This chapter described the Efficient Market Theory, the factors in society that affect the market, and the market as a bubble. It summarized the project and described our accomplishments and what we learned.

We accomplished our objectives during this IQP. We learned about the stock market, its history, and background information. We were then able to use certain strategies to test the market through a simulation. Based on the simulation, we were able to find out how society affects the market and vice versa.

After learning about significant information on the stock market such as the exchanges and indexes, we further researched information on how to get started in the market. We learned important terms and how the floor worked. We then researched important strategies that we could use during our simulation. We achieved our educational objective.

Our simulation achieved good results since we made a profit. However, we believe that this does not necessarily mean that the strategies we used are perfect for investing. We are not sure that these strategies are effective after only one test. This may have just been a coincidence. If we had more time, we would test these again to be more confident in this group of strategies. We believe the market is volatile and that we were lucky with our simulation. Even though we could not conclude that the strategies are fully effective, we learned that they can be useful if used properly. Vertical Line Charts

are useful in detecting uptrends and downtrends although it is harder to predict what future prices would be from using them. They were more useful to study before and after the simulation (before: when picking companies, after: when seeing the trends) rather than during the simulation since according to Dow's Theory, there may be secondary trends that counter the uptrends at any time. Moving Average Lines are useful in indicating how the stock price changes during a period. Trading Volume method is useful when the volume is unusually high or unusually low. These are usually indicators when to sell or buy, respectively. Speculation is useful only if an investor is aware of the risks involved. We knew that sales during the holiday season would increase for only a few companies, but we took the chance to invest in four retail chains as well as companies that have products that might sell better. Speculation must be used with confidence and at the right time. Based on one simulation test, we obtained our objective of deciphering these strategies.

Finally, from our simulation and its results, we were able to find the effects of the stock market and society upon each other. We were able to see that world events and company events are factors in the status of the market. War resolutions help the market, while war worries do not. Increased company sales during the holiday season help the market. Optimism helps the market. When the market reaches high levels, society is optimistic. When the market reaches low levels, there is panic in society. There is a cycle as worries cause pessimism which in turn does not help the market and causes more pessimism. Optimism causes society to be in a better buying mood which helps the market and optimism further grows. Society and the market are linked. They affect each

other directly. The simulation was an effective tool to decipher the strategies as well as finding the effects of the market and society.

Appendices

Appendix A Glossary

The following are definitions of the terms used in this IQP as well other terms which may be useful in dealing with the stock market.

A

Analyst: an analyst is a person with the knowledge in evaluating financial investments. He performs investment research and makes recommendations to investors to buy, sell, or hold. Most analysts concentrate on a single industry and are helpful in getting company data. Analysts can be referred to as brokers.

Assets: an asset is any possession that has value in an exchange. It can be money, stocks, bonds, or property.

C

Characteristic Line: a characteristic line relates the return on an asset or portfolio to the return on a market index. The slope measures volatility.

D

Dispersion: dispersion is the spread of a distribution about its average, or mean value. The greater the spread, the greater the variability. It can be measured either absolutely or relatively.

Diversification: diversification is the spreading of investments over more than one company or industry to reduce the uncertainty of future returns caused by unsystematic risk.

Dividend: a dividend is the distribution of earnings to share holders, divided by the class of security and issued in the form of money, stock, property, etc. The amount is decided by the Board of Directors and is usually paid quarterly. Mutual fund dividends are paid out of income from the fund's investments.

E

Earnings Per Share (EPS): EPS is the portion of a company's profit allocated to each outstanding share of common stock. Reported or estimated net income for a period of time is divided by the total number of shares outstanding during that period.

Efficient Market: an efficient market is one in which prices always fully reflect all available, relevant information. Adjustment to new information is virtually instantaneous.

Efficient Portfolio: an efficient portfolio is one that is fully diversified. For any given rate of return, no other portfolio has less risk, and for a given level of risk, no other portfolio provides superior returns. All efficient portfolios are perfectly correlated with a general market index.

Expected Rate of Return: the expected rate of return on an asset or portfolio is the weighted arithmetic average of all possible outcomes, where the weights are the probabilities that each outcome will occur. It is the expected value or mean of a probability distribution.

Equity: an equity is an ownership interest in a corporation in the form of stock. It is also the total assets minus the total liabilities.

G

Geometric Mean: the geometric mean is the n^{th} root of the product of n observations. It is the correct measure to use when averaging annual rates of return, compounded annually, over time.

I

Intrinsic Value: the intrinsic value of an asset is the value that asset "ought" to have as judged by an investor. Discrepancies between current value and intrinsic value are often the basis for decisions to buy or sell the asset.

M

Market Portfolio: the market portfolio includes all risky assets in proportion to their market value.

Market Value: the market value is the market price. The market price is the price buyers and sellers trade similar items in an open marketplace. The market value is the current market price of a security as indicated by the latest trade recorded.

Median: the median of a distribution is the value that divides the number of observations in half. If the distribution is normal, the mean and median will coincide. If the distribution is not normal and has positive skewness, the mean will exceed the median. If the skewness is negative, the mean will be below the median.

N

Nominal Return: the nominal return on an asset is the rate of return in monetary terms, that is, unadjusted for any change in the price level. The nominal return is contrasted with the real return, which is adjusted for changes in the price level.

P

Price/Earnings Ratio (P/E): the P/E a statistic in which the current price of a stock is divided by the earnings per share for a particular year. It is also called the "multiple". Reports show the P/E of the most recent year for actual figures, estimated value of the current year, and projected value of the following year. Investors compare the P/E's of stocks with past P/E's and present P/E's of other stocks or with market averages. The P/E is a measure of price. It does not tell whether a stock should sell at a market multiple or higher or lower than that.

Probability Distribution: a probability distribution is a distribution of possible outcomes with an indication of the subjective or objective probability of each occurring.

R

Random Selection: random selection is similar to picking stocks by throwing darts at a stock listing. It means that each element in the relevant population has a known and positive probability of selection.

Random Walk: a random walk implies that there is no discernible patter of travel. The size and direction of the next step cannot be predicted from the size and direction of the last or even from all the previous steps. It is a term used in mathematics and statistics to describe a process in which successive changes are statistically independent.

S

Sampling: sampling is the process of selecting a subset of a population. It can be random. The usefulness of a sample depends upon its representativeness, or the degree to which one can make inferences about the excluded population on the basis of the sample. Many stock market indexes use sampling in their calculations.

Security: a security is an investment instrument issued by an organization which offers evidence of debt or equity. It is any note, stock, bond, etc and can be property which is pledged as collateral for a loan.

Shares Outstanding: shares outstanding are the shares of a corporation's stock that have been issued and are in the hands of the public. Also called outstanding stock

Short Selling: selling a security that is not owned, but purchasing it at a later time for delivery. The sale would be made in anticipation of a fall in the share price.

Skewness: skewness is a measure of the asymmetry of a distribution. A normal distribution is symmetrical and has no skewness. If there are more observations to the left of the mean, it is positive. If there are more on the right, it is negative.

Stock: a stock is an instrument that signifies ownership in a corporation, and represents a claim on its proportional share in the corporation's assets and profits. Ownership in a company is determined by the number of shares a person owns divided by the total number of shares outstanding.

Stock Dividend: a stock dividend is issued capital given to stockholders. It is paid as additional shares of stock rather than as cash. Cash dividends are taxable while stock dividends are not taxed until the shares are sold.

Stock Splits: a stock split is the subdividing of outstanding stocks without changing the issued equity.

V

Volatility: volatility is the degree of price fluctuation for a given asset, rate, or index. It is usually expressed as a variance or standard deviation.

Volume: volume is the number of shares, bonds, etc, traded during a given period, for a security or an entire exchange.

W

Weighting: weighting is the specification of the relative importance for each item in a group. For example, stocks included in indexes may be weighted equally or according to value.

Y

Yield: yield is a return on an investor's capital investment. The yield is calculated by dividing the dividend by price. It is a bond term, taking into the account any discount or premium in price of a bond compared to the par value it will pay at maturity. A high yield may mean the dividend is in trouble.

Appendix B Timeline of the NYSE

1600's

1685 – Wall Street Laid Out

1700's

1790 – U.S. investment markets born

1800's

1817 – NY Brokers form New York Stock & Exchange Board

1857 – Panic of 1857

1863 – New York Stock & Exchange Board becomes New York Stock Exchange

1865 – The Exchange closes for more than a week after Abraham Lincoln's assassination; The NYSE moves to 10-12 Broad Street, its first home

1873 – NYSE closes for ten days as a severe financial panic grips the nation

1900's

1903 – NYSE moves to 18 Broad Street where the current trading floor is bigger

1907 – Panic of 1907

1914 – World War I starts; NYSE closes for four and half months, the longest shutdown in its history

1922 – NYSE expands in building space with a new trading room

1929 – Black Thursday: stock prices fall sharply October 24 with a record volume of nearly 13 million shares. Five days later, the market crashes on volume of over 16 million shares marking the beginning of the Great Depression

1938 – William McChesney Martin, Jr., becomes the first full time salaried president of the exchange

1939 – The NYSE opens its trading floor gallery to the public and is known as the Interactive Education Center

1943 – Women work on the trading floor for the first time ending the tradition of men only

1945 – NYSE closes on August 15th to August 16th for V-J Day

1954 – NYSE launches "Own Your Share of American Business" educational and marketing program, aimed at expanding public participation in the stock market

1955 – President Eisenhower suffers a heart attack on September 24, creating a wave of selling at the NYSE, both recover quickly

1961 – International Federation of Stock Exchanges is organized

1963 – President Kennedy is assassinated; NYSE closes early to avoid panic selling

1967 – First woman member joins NYSE

1970 – First black member joins NYSE

1971 – NYSE is incorporated as a not-for-profit corporation

1972 – NYSE's Board of Governors replaced by Board of Directors

1976 – First Non-US Member joins NYSE

1987 – The DJIA experiences its largest one day drop in history, 508 points on October 19; Volume surges to 604 million shares, the next day it reaches 608 million shares

1992 – Bicentennial: NYSE celebrates 200th anniversary

1997 – DJIA plummets 554 points on October 27 triggering the "circuit breaker" rule for the first time; trading halts at 3:30pm

2000's

2000 – DJIA closes at an all time high of 11,722.98 on January 14

2000 – DJIA experiences its largest one day gain of 499.19 points to close at 10,630.60 on March 16

2000 – DJIA experiences its largest one day loss of 617.78 points to close at 10,305.77 on April 14

2001 – Terrorist attacks destroy World Trade Center on September 11; NYSE closes for four days, the longest since 1933 and reopens on September 17 setting a record volume of 2.37 billion shares

Appendix C Reversal Patterns

The following are examples of reversal patterns. There are two types: top and bottom.

Top Reversal Patterns

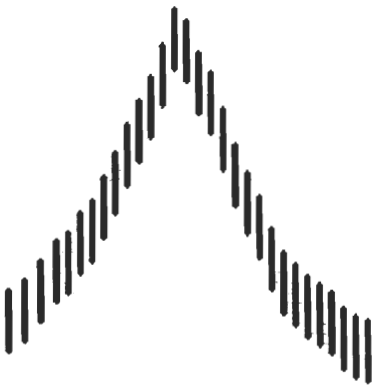


Fig. C.1 Spike Top

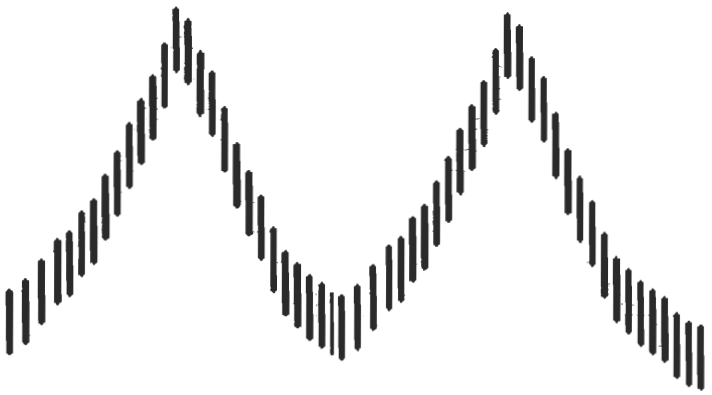


Fig. C.2 Double Top

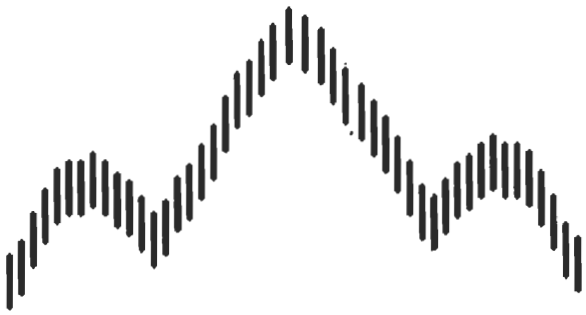


Fig. C.3 Head-and-Shoulders Top

Fig. C.4 Rounded Top

Bottom Reversal Patterns

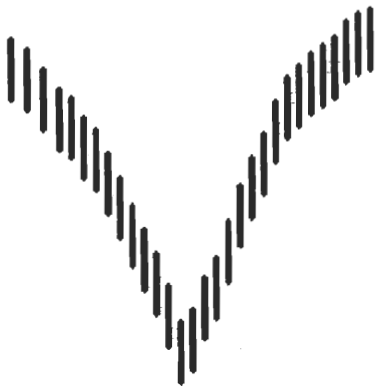


Fig. C.5 V-Bottom

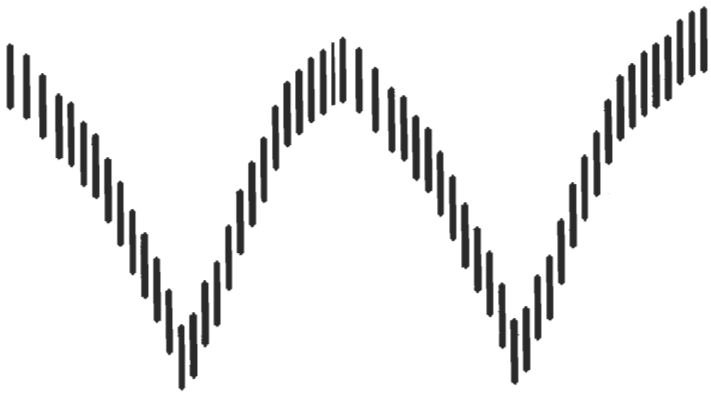


Fig. C.6 Double Bottom

Fig. C.7 Head-and-Shoulders Bottom

Fig. C.8 Saucer Bottom

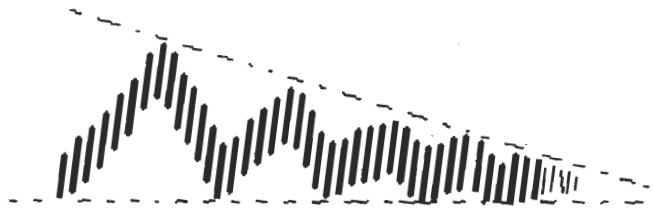


Fig. C.9 Coil Bottom

Appendix D Stock Flow Charts

NOTE: Boxes represent stocks (microeconomic term for something that has quantity, this does not refer to stocks in the stock market) and arrows represent flows. Plusses and minuses in parentheses represent positive and negative feedback loops respectively. Plusses mean directly proportional and minuses mean inversely proportional.

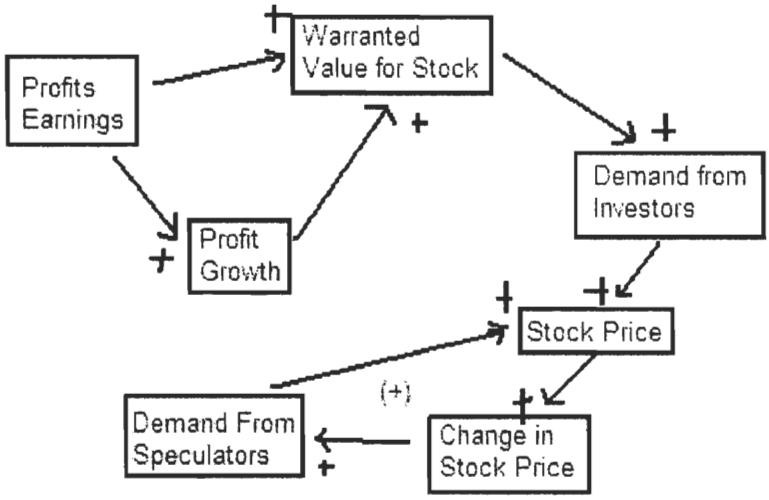


Fig. D.1 Stock Flow Chart of Stock Market Prices

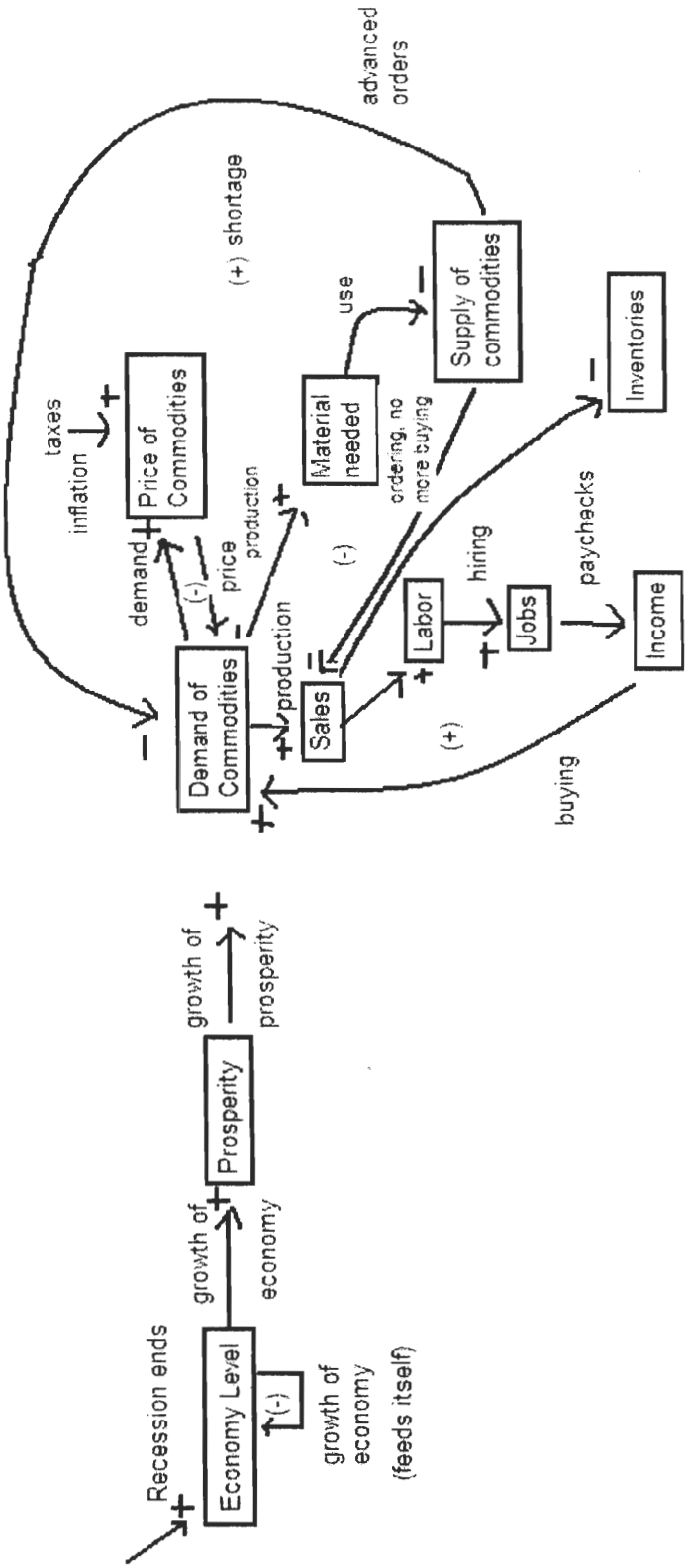


Fig. D.2 Stock Flow Chart of Supply/Demand Effects

References/Bibliography

1. Crowell, Richard A. Stock Market Strategy. New York: McGraw-Hill Inc., 1977.

2. Duclaux, Denise. "Stocks Sink; Dow, S&P 500 at 3-Month Lows." January 24, 2003.

3. Gelsi, Steve. "Dow rallies on big-cap push Wal-Mart, GM weigh in as 2003 gains resume." Available [Online] http://www.quicken.com/investments/news_center/story/?story=NewsStory/cbswatch/20030109/DE862AAC-9A64-4D01-BF9F-980661D6F104.var&column=P0DST , January 9, 2003.

4. Jenks, Jeremy. Stock Selection. New York: John Wiley and Sons, 1984.

5. Krow, Harvey A. Stock Market Behavior: The Technical Approach to Understanding Wall Street. New York: Random House, 1969.

6. Lorie, James H. The Stock Market: Theories and Evidence. Homewood, IL: Dow Jones – Irwin, 1985.

7. NASDAQ Index. Available [Online] http://www.ameritrade.com/educationv2/fhtml/stockmarket/nasdaq.fhtml, 2003.

8. NYSE. Available [Online] http://www.nyse.com/about/timeline/1610.html, 2003.

9. NYSE Trading Floor. Available [Online] http://www.nyse.com/floor/floor.html, 2003.

10. Reuters CA. "Hewlett Packard Offers AOL's Instant Messaging." January 22, 2003.

11. Reuters CT. "Online Stores Face Holiday Fraud Losses." December 11, 2002.

12. Reuters WA. "The Online Retail Sales Rose in Third Quarter." November 22, 2002.

13. S&P 500 Index. Available [Online] http://www.ameritrade.com/educationv2/fhtml/stockmarket/sandp.fhtml, 2003.

14. Stevenson, Reed. "Amazon Posts Profit for 2nd Time." January 23, 2003.

15. Stock Market History. Available [Online] http://www.stocks-investing.com/stock-market-history.html, 2002-2003.

16. Thomas, Roger. "The Dow Doesn't Tell the Whole Story." Available [Online] http://www.investoradvice.org/Articles/rthomas5.htm, 2002.

17. Amazon.com. www.amazon.com

18. AT&T Wireless. www.att.com/wireless

19. Best Buy. www.bestbuy.com

20. CNN Portfolio. www.money.cnn.com

21. Dell. www.dell.com

22. Hasbro. www.hasbro.com

23. Hewlett Packard. www.hp.com

24. Mattel. www.mattel.com

25. Quicken Portfolio. www.quicken.com

26. Target. www.target.com

27. Verizon. www.verizon.com

28. Wal-Mart. www.walmart.com