Stock Market Simulation

An Interactive Qualifying Project Report:
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by

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Abstract

A ten-week stock market simulation was conducted to examine different investing strategies. Each strategy has unique trading methods which were employed in the stock simulation. Different risk/reward factors of each strategy were analyzed. Through this investigation, the project team has become more knowledgeable about the stock market and better prepared for future investing.

Acknowledgement

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1. Introduction

1.1 Goals

The main goal we have for this project is to become knowledgeable investors. This will include the different types of investments and ways of investing as well as the risk of investing. This knowledge should help us become more profitable investors in the future. Secondly, we would also like to be able to predict trends in the stock market and be able to plan accordingly. Being able to predict trends before they happen should allow us to make more money then we lose, which is always helpful. Another goal that we have is that, during this simulation we hope to have successful results. However, even if we lose and learn from our mistakes this project will be a great investment of our time. Learning the stock market with no risk is much better then learning by losing money. Another goal of this project is to improve our understanding of the charts and be able to use these charts to invest better in the future.

1.2 Stock Market Background

The history of stock market trading in the United States started over two hundred years ago. The colonial government financed the war by selling bonds, government notes promising to pay out at profit at a later date. Private banks began to raise money by issuing stocks, or shares of the company to raise their own money. This was a new market, and a new form of investing money. In 1792, a meeting of twenty-four large merchants resulted into a creation of a market known as the New York Stock Exchange (NYSE). At the meeting, the merchants agreed to meet daily on Wall Street to daily trade stocks and bonds.

In the mid-1800s, the United States was experiencing rapid growth and companies needed funds to assist in the expansion required to meet the new demand. Companies also realized that investors would be interested in buying stock in the company. Stocks had facilitated the expansion of the companies and the great potential of the stock market was becoming increasingly apparent to both the investors and the companies.

This created opportunities for the NYSE. It acted as a more stable investment alternative, for people interested in the stock market arena. The smaller companies making up the stock market formed into what eventually became the American Stock Exchange (AMEX). Contrary to the 80-year old history, today the NYSE, AMEX, NASDAQ and hundreds of other exchange markets make significant contributions to the national and global economy.

The growth of market participants required the government to regulate the stock market more and protect those investing in stock. History was made in 1934, when following the Great Crash, Congress passed the Securities and Exchange Act. This act formed the Securities and Exchange Commission (SEC), which regulates American stock market trading with the help of the exchanges. It also includes overseeing the requirements for a company to issue stock shares to the public and ensures that the company offers relevant information to potential investors. The SEC also oversees the daily actions of market exchanges and how they trade the securities offered. Investing in stocks was a "hobby" for the rich but the average person has come to realize the value of the investing in stocks [9].

1.3 Types of Investments

This section will outline the different options investors have when they decide on an investment plan. The types in this section are very vague, but explain the different paths of investment one may explore.

1.3.1 Mutual Funds

Mutual funds are essentially premade portfolios compiled by fund managers. They will rarely make substantial gains because fund managers over-diversify the funds. This causes some companies to gain and some fall off the charts. They remain popular, however, because most of the research and work was done by the manager. This attracts new investors or those who do not wish to play the market on their own. These investors are then hit with commission fees that could have been avoided if they had just created their own portfolio. Overall, mutual funds are a decent option for certain types of investors because they are relatively safe and very easy to deal with.

1.3.2 Certificates of Deposit

Certificates of deposit, commonly referred to as CD's, are one of the safest forms of investment one can choose. They offer a guaranteed rate of return while being FDIC insured. This ensures that they will never perform sporadically or surprise anyone. All certificates work on a time frame, usually on the scale of months or years. The longer the CD is for, the higher the rate of return. However, one must wait for the time period to end to receive the money. The only real risk involved is the possibility of the rate of return being less than the rate of inflation. The money invested would still gain its interest but would essentially be a loss of money due to

the increase in the value of money. This can also be avoided, however, with inflation-insured certificates.

1.3.3   Bonds

Bonds are effectively a way for the issuer to fund an investment by borrowing money from the investor and agreeing to pay back the principal and interest over a specified period of time. That period of time is referred to as the maturity of the bond. Risks vary between different types of bonds. Some, insured by the government, have no risk whereas others, focused on companies, may default if the company cannot pay back the agreed amount of principal and interest. This is not very common and can be avoided by researching the company being invested in. Minimum investment will usually be very large, resulting in a rarity in bond portfolios. However, there are bond funds offered that will offer more of a diversified solution while keeping the total investment reasonable.

1.3.4   Money Market

The money market is a shorter term form of bonds. It is based on the same debt system. These are usually not insured, so there is a risk involved but it is very low. The market caters to those who want to borrow or lend for about a year or less with the same structure of guaranteed rates of return and specified maturities.

1.3.5   Stock Market

The stock market is a large system where companies can go public and sell shares of their companies, returning any growth to those investors while leaving the burden of losses on the investor as well. It's a massive system allowing anyone to obtain partial ownership of any

company. There are many different exchanges one can choose to trade in, such as the NYSE or the NASDAQ. The performance will, over time, outperform any of the aforementioned types of investment but is also definitely the most risky. Companies crash on the market all the time, but many companies also rise at generous rates. It is definitely the most demanding and intensive method outlined due to the variety of options and the risks involved, but for those investors looking for a sizable payday, the stock market is the favorite by far [1].

1.4   Risks of Investing

There are many different types of risk that should be considered when thinking about any kind of investment. Every type of investment has some degree of risk associated with it such as; certificates of deposit or government issued bonds carry low risk, other forms such as a stock carry a much higher risk and research must be done in order to assure that one will not lose money. Generally the higher the risk the greater the return will be, but there is more room for failure when there is more risk so one might incur a loss when taking a higher risk. This is often referred to as the risk/reward ratio. Low risk venture, such as a certificate of deposit, are usually played out over a long period of time because their annual return is smaller but steady whereas a high risk venture, such as a stock, is a relatively short investment because the return is not guaranteed if you stay in for a long period of time [8].

The difference between investing and speculation is quite large but usually not fully understood. Speculation is when you take an above average risk because you think something will pay off in the end with a high reward. Day trading is a perfect example of speculation because you are buying stocks in hopes that they will rise in price over a short period of time. A person can make an intelligent speculation, through research they've done and not be at such a

high risk of failure. An investment is a low to average risk that has an average return generally over a long period of time. This does not mean that all investments are risk free; research must still be done to help guarantee a return on your investment [13].

A person must consider their financial standing if they are interested in investing. One should be sure to have enough money set aside so that if an emergency occurs they could be set for a few months without the need to disrupt their investment. It is also advisable that all of one's investments are not in a single entity, but distributed out over a range of investments to minimize the risk of losing all or a large majority of their money. Time is also something that someone should consider when they are interested in investing because research is a critical role in a successful portfolio. Investing on your own may be more profitable for oneself because they do not have to pay a brokerage firm, but it is also more risky because you cannot devote as much time to research as a company would [13].

2. Investment Methods

2.1 *Overview*

This section will cover the main categories of investing that we will be running simulations on. The first three are typical stock-trading strategies that all contrast each other. Following those two are mutual funds and bonds. Those are longer term deals and will be dealt with in a different manner because they aren't consisting of individual stock trades. Finally, the long-term investment method will involve individual stocks, but will be run differently from the first three because no trading will be allowed once the simulation has begun.

2.2 *Value Investing*

Value investing is an investment technique where one buys shares that are believed to be undervalued in hopes that the true (higher) value of the stock will be realized. Therefore, value investing requires more of a long-term outlook. To determine if a stock in undervalued, investors who opt for value investing typically look for low price-to-earnings ratios and low price-to-book values. Value investing is not as focused on technical analysis as it is on the stock's fundamentals. This means that value investing examines the stock's current market value and the company's intrinsic value. Investors should settle on a formula that works for them, but it will probably include as a minimum these elements:

- A Price Earnings Ratio (P/E) in the bottom 10 percent of its sector.
- A PEG of less than one. A PEG of less than one may indicate the stock is undervalued.
- A Debt to Equity Ratio of less than one.

- Strong earnings growth over an extended period. A realistic number might be in the 6% - 8% range over 7 to 10 years.

- A Price to Book ratio of one or less.

- Don't pay more that 60% to 70% of the stock's intrinsic per share price.

A big challenge for the value investor, and all investors for that matter, is reconciling market value and book value [11].

2.2.1   Advantages

The major advantages of using information saving value investing are:

1) The performance of the exact investment strategy can be tested ahead of implementation by reproduced return experience.

2) The costs of implementing the investment strategy are low with respect to data gathering and analysis.

3) It is easier to diversify the portfolio on multiple stocks in order to avoid liquidity issues when trading.

The major advantage of using value investing is that it produces a better estimate of the true fundamental value of the stock thereby enabling higher gross investment returns [7].

2.2.2   Disadvantages and Risks

The first disadvantage to this method is that these are long term investments. The value investing technique requires you to hold onto your stocks for around 3-5 years on average. The investor could also sell after this time thinking that the stocks have had ample time to grow when if the investor waited another five years the value of these stocks would have increased further.

Book value also does not reflect the market's current state. Like that of all investing, there is an inherited risk of losing money instead of gaining money but this strategy is not high risk[12].

2.2.3   Who Uses This Method?

Someone who believes the market overreacts to good and bad news, which can cause stocks to be traded for less value than they are worth, might be more prone to value investing. Those who engage in value investing get out when they think the market has corrected the price. The investor that wants to "sit and hold" their stocks would use this method, investing in a few stocks and rarely trading or selling.

2.3   Growth Investing

This section will cover the strategy of growth investing. It includes advantages and disadvantages, as well as the type of investor that would be likely to use this tactic, in the following subsections.

2.3.1   Advantages

Growth investing involves choosing stocks based on their growth patterns rather than their price. The advantages here circle solely around the growth pattern. The investors that choose this strategy base their success on stocks that have previously followed a very consistent growth trend. These, along with every other stock strategy, are imperfect but will often result in gains because all stocks selected are on the rise and have exhibited that pattern for a significant amount of time. Most stocks on this pattern will continue but, obviously, cannot be counted on regularly. The real advantage to this strategy is the fact that all portfolios rely on growth and all

stocks selected under this strategy have shown signs of growth prior to and at the time of investment [5].

2.3.2   Disadvantages and Risks

Although many stocks tend to follow trends and stick to their prior tendencies, the stock market is so unreliable due to its volatility. Obviously, many strategies may work for investors, but the market has always shown a tendency over the years to vary and occasionally kill trends. The risk behind growth investing is the fact that many stocks may exhibit a trend of growth but all companies will eventually have a downward fall. This strategy is one of the more commonly chosen and favorable investments, but it is not always a profitable decision. It is a relatively safe play but the risk may not always outweigh the advantage [5].

2.3.3   Who Uses This Method?

This method is a very common strategy and attracts many investors.   It is a strategy that does involve some research but not as much as many others. A novice investor could begin with this and just refer to charts of stocks over the past year and determine growth patterns. The patterns they are looking for usually correspond to their desired investment period. Therefore, an investor looking for a 3-month stock will refer to the prior 3 months and invest corresponding to the growth on those charts.   Most professional investors will incorporate this strategy, occasionally along with other strategies, to diversify their portfolio. However, most pros will use more complex strategies to invest to increase their chance of success. Despite its upside, it is a fairly basic strategy and it will not be as successful as some professional strategies.

2.4   GARP Investing

GARP, growth at a reasonable price, investing is a combination of both growth and value investing. GARP investors look for companies that are both somewhat undervalued but and sustainable growth potential. GARPers, people who invest in these kinds of stocks, look for companies that won't necessarily fall into either growth or value criteria.

2.4.1   Advantages

One advantage of GARP investing is that it is generally fairly steady in all types of markets. The GARP strategy may not produce as well when compared to growth or value strategies in some markets but when they are not doing as well the GARP strategy will not lose as much money. GARP investing is a very consistent performer with somewhat predictable returns [2].

2.4.2   Disadvantages and Risks

GARP investing can be fairly misleading. It seems to be a fairly simple type of investment but if someone is not very careful in their stock selection they could lose money. A person should be fairly competent in value and growth investing before they decide to try GARP. Some people feel that GARP is a very wishy-washy style of investing and therefore not credible because it does not have meaningful standards. If the market is in a face where strictly value or growth investing is profiting very high, it will not see as high returns [2].

2.4.3   Who Uses This Method?

Many people like this method of investing because it is more consistent and has more predictable returns then just value or growth investing. People also like this method because it

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does not keep all of the funds in one sole situation where if the market is doing poorly they will do poorly. This strategy is also very numbers friendly so people like this because they can go based off of numbers more easily than other forms of investing. One of the most well-known GARP investors is Peter Lynch. He used this strategy over many years and had a twenty-nine percent annual return over that period [4].

2.5   Mutual Funds

Mutual fund investing has become very popular over recent years because they are not very volatile and fairly simple. Since a mutual fund is already a diversified portfolio very little research has to be done which is another reason it is very popular.

2.5.1   Advantages

The main advantage of mutual funds is that they are very stable and simple for the common investor. These portfolios are usually overlooked by a professional manager that can be hired by an investor to manage their portfolio. Another advantage is that the portfolios are diversified, which is another important factor, so when one segment of the market is down it does not affect your whole portfolio [3].

2.5.2   Disadvantages and Risks

One disadvantage of mutual funds is that they are not very high in return so if someone is looking to make a lot of money quickly this is not the place to do it. Another disadvantage is that one must pay someone to manage these portfolios along with other fees that are associated with some funds [3].

2.5.3 Who Uses This Method?

Many people who would like to have some form of investment choose this option because it will give you a well diversified portfolio without much research and time spent. This is a very smart investment for someone who can afford to put money away and not touch it for long periods of time because that will earn the most money [13].

2.6 Bonds

Bonds are effectively a way for the issuer to fund an investment by borrowing money from the investor and agreeing to pay back the principal and interest over a specified period of time. That period of time is referred to as the maturity of the bond. Risks vary between different types of bonds. Some, insured by the government, have no risk whereas others, focused on companies, may default if the company cannot pay back the agreed amount of principal and interest. This is not very common and can be avoided by researching the company being invested in. Minimum investment will usually be very large, resulting in a rarity in bond portfolios. However, there are bond funds offered that will offer more of a diversified solution while keeping the total investment reasonable.

2.6.1 Advantages

The bond market is no exception to this rule. Bonds in general are considered less risky than stocks for several reasons:

- Bonds carry the promise of their issuer to return the face value of the security to the holder at maturity; stocks have no such promise from their issuer.

- Most bonds pay investors a fixed rate of interest income that is also backed by a promise from the issuer. Stocks sometimes pay dividends, but their issuer has no obligation to make these payments to shareholders.

- Historically the bond market has been less vulnerable to price swings or volatility than the stock market.

The average returns from bond investments have also been historically lower, if more stable, than average stock market returns.

2.6.2 Disadvantages and Risks

There are several risks with bonds. First there is the interest rate risk, when interest rates rise; bond prices fall; when rates decline, bond prices rise. The longer the time to a bond's maturity, the greater risk involved. Then there is the reinvestment risk, when interest rates are declining, investors have to reinvest their interest income and any return of principal, whether scheduled or unscheduled, at lower prevailing rates. There is also an inflation risk, inflation causes tomorrow's dollar to be worth less than today's. Inflation also leads to higher interest rates, which in turn leads to lower bond prices. Inflation-indexed securities such as Treasury Inflation Protection Securities (TIPS) are structured to remove inflation risk. The market risk is the risk that the bond market as a whole would decline, bringing the value of individual securities down with it regardless of their fundamental characteristics.

2.6.3 Who Uses This Method?

Bond funds offer a convenient and affordable way to invest in a diversified portfolio of bonds. The investor buys shares in a portfolio of bonds that is created or managed to pursue a

specific investment objective such as current income, current tax-exempt income, total return, or to match the performance of a market index. The portfolio might invest in a particular type of bond (government, municipal, mortgage or high-yield) or a particular maturity range (short-term: three years or less; intermediate term: three to 10 years; or long-term: usually 10 years or longer). By diversifying the portfolio the risk of investing is decreased.

2.7   Long Term Investing

This section gives an outline of the strategy of buying stocks and holding on to them for long periods of time. This strategy will allow us to sit on some stocks for the entirety of the ten-week simulation. Its advantages and disadvantages, as well as an idea of what type of investor employs this method, is contained in the following subsections.

2.7.1   Advantages

Long term investing has an obvious advantage, which does not correspond to any investment strategy. Its advantage is that the market will always grow. This doesn't mean every stock will grow. However, over time in a well-diversified portfolio, long term investing will usually pay off. This is less of a strategy than a guideline, but will almost always result in benefits. Most strategies combined with this theory will grow in their profits. For our purpose, it will demonstrate the usefulness of leaving stocks alone while they flow with the market. Obviously, due to its lack of strategy, it is a very unreliable system, but with the appropriate investments made, it may make the profits maximize more than short-term investments [6].

2.7.2　　Disadvantages and Risks

The big disadvantage to this method is the fact that all stocks are very volatile. It's true that most stocks will eventually rise with time in the stock market, but many stocks will crash. This method relies on educated investments. The market will rise, but the stocks that rise are almost always stocks that have some value or growth trends. In short, stocks will not just rise because an investor holds onto it for an extended period of time. The only benefit to this method is that it allows the stock to play out its growth trend rather than trading it away before it reaches its potential. Therefore, many stocks will drop during the long term that is being invested in [6].

2.7.3　　Who Uses This Method?

This method is fairly universal. However, many new investors will implement this strategy due to the fact that it is much safer than short term investing. It ensures that all stocks in a portfolio are given a chance to reach their potential. Short term investors will trade on trends so that they catch a stock on a growth spurt and sell before it has a chance to fall again. These long term investments are for those that do not have that level of research or knowledge. They are much safer because they focus on long, slow trends, whereas those shorter investments will rely on spurts of mere days.

3.   Simulation

In this chapter of the report we focused on the simulation. We discussed the selection of our stocks, mutual funds, and bonds, along with an investment overview. Once the simulation was completed we did a technical analysis for each section. Final results were then done to show the profit or losses for each type of trading strategy.

3.1   Value Investing

This section of the report will cover how the value stocks were selected, which value stocks were selected, the performance of the stocks as well as a general background on the company and the technical analysis of the value stocks.

3.1.1   Selection

The ideal value stock is as follows; a Price Earnings Ratio (P/E) in the bottom 10 percent of its sector, a PEG of less than one, a PEG of less than one may indicate the stock is undervalued, a debt to Equity Ratio of less than one, strong earnings growth over an extended period, a realistic number might be in the 6% - 8% range over 7 to 10 years, a Price to Book ratio of one or less, and don't pay more that 60% to 70% of the stock's intrinsic per share price [11].

The first stock selected was ACE limited. "ACE limited and its subsidiaries provide a range of property and casualty insurance and reinsurance products to commercial and individual customers worldwide. It operates in four segments: Insurance North American, Insurance Overseas General, Global Reinsurance, and Life Insurance and Reinsurance. The Insurance North American segment provides general liability, excess property, workers' compensation, general and automobile liability, professional lines, aerospace, and accident and health coverage,

as well as claims and risk management products and services. This segment also provides various personal accident, health, and travel insurance coverage; and medical managed care, integrated disability services, preloss control and risk management services, and other related services. The Insurance Overseas General segment writes property, casualty, professional lines, marine, energy, aviation, political risk, consumer-oriented products, and accident and health coverages primarily in the Asia Pacific, the Far East, Latin America, and Europe. The Global Reinsurance segment provides property catastrophe reinsurance to insurers of commercial and personal property; proportional property; and per risk excess of loss treaty reinsurance products; traditional and specialty property, casualty, marine, aviation, and medical malpractice reinsurance products. The Life Insurance and Reinsurance segment provides traditional life reinsurance and various life insurance products, including whole life, endowment plans, universal life, personal accident, and term life policies. The company distributes its products through retail and wholesale brokers, general agents, independent agents, managing general agents, managing general underwriters, direct marketing operations, and Internet distribution channels. ACE Limited was founded in 1985 and is headquartered in Hamilton, Bermuda [14]." The performance can be seen in Figure 1.
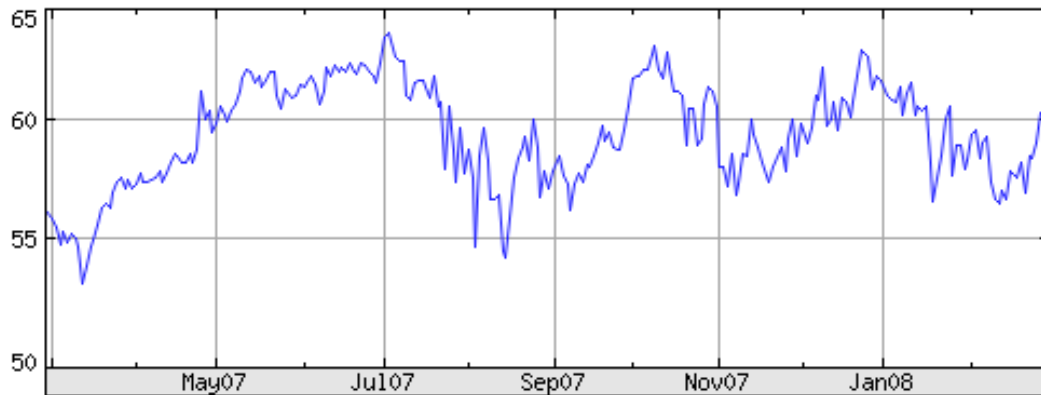
Figure 1: ACE Ltd. 1 year Performance

The second stock selected was American Financial Group, Incorporated. "American Financial Group, Inc., through its subsidiaries, underwrites property and casualty insurance products in the United States. It also sells various retirement products, primarily fixed, indexed, and variable annuities; life; and supplemental health insurance products. The company primarily offers property and transportation insurance that comprise inland and ocean marine products, agricultural-related products, and commercial automobile insurance; specialty casualty products, which consist of executive and professional liability, umbrella and excess liability, and excess and surplus; and specialty financial products that include fidelity and surety bonds, and collateral protection; as well as and workers' compensation. It serves individuals, families, associations, and small businesses through independent property and casualty insurance agents and brokers. The company was founded in 1872 and is based in Cincinnati, Ohio [14]."   The performance on the AFG stock can be seen in Figure 2.

[31]
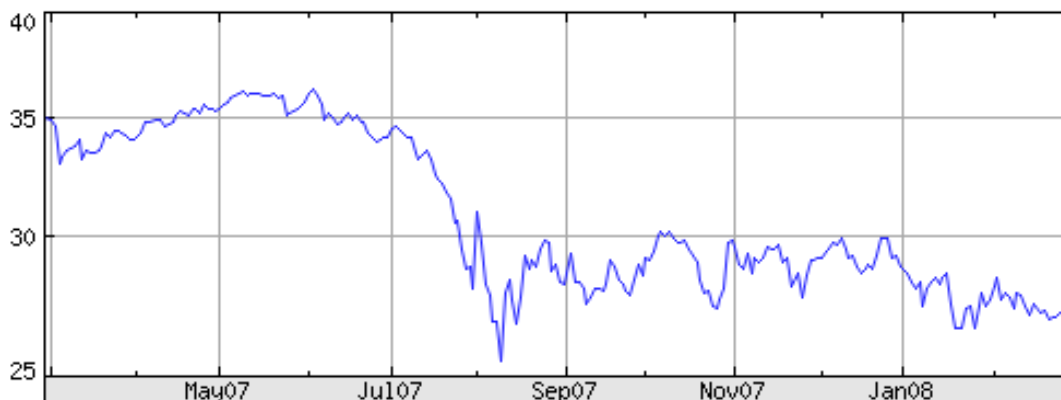
Figure 2: AFG 1 year Performance

The third stock selected was W. R. Berkley Corporation. "W. R. Berkley Corporation, through its subsidiaries, operates property casualty insurance business in the United States and internationally. It has four segments: Specialty, Regional, Alternative Markets, and Reinsurance. The Specialty segment underwrites third-party liability risks, principally within excess and surplus lines, and its lines of business includes premises operations, professional liability, commercial automobile, products liability, and property lines. The Regional segment provides commercial insurance products to small-to-mid-sized businesses and state and local governmental entities primarily in the United States and the District of Columbia. The Alternative Markets segment specializes in insuring, reinsuring, and administering self-insurance programs and other alternative risk transfer mechanisms to employers, employer groups, insurers, and other groups seeking alternative ways to manage their exposure to risks. It also provides various fee-based services, including claims, administrative, and consulting services. The Reinsurance segment underwrites property casualty reinsurance on both a treaty and a facultative basis, which include professional liability, umbrella, worker's compensation, commercial automobile, and trucking. The company's international operations include commercial and personal property casualty insurance, and savings and life products, which include professional

[32]

indemnity, director's and officer's liability, medical malpractice, general liability and personal accident, and travel business in Europe, South America, and the Philippines. W. R. Berkley Corporation was founded in 1967 and is based in Greenwich, Connecticut [14]." The performance of the BER stock can be seen in Figure 3.
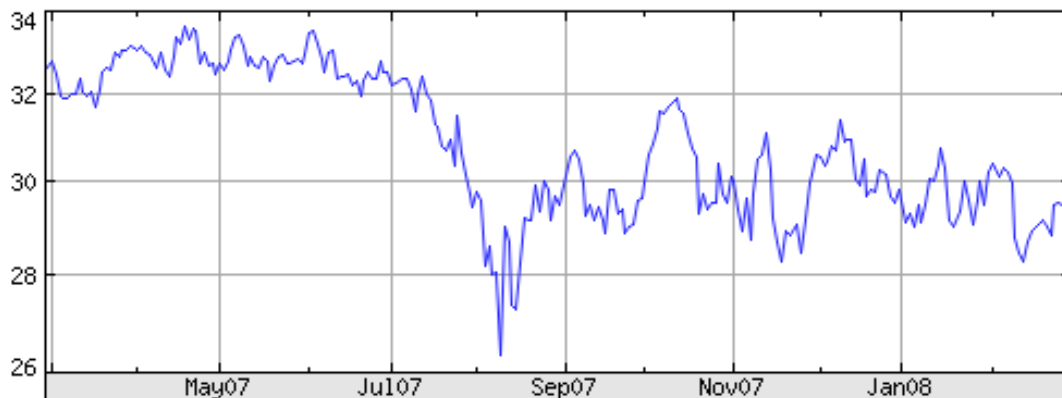
Figure 3: BER 1 year Performance

The fourth stock selected was Microsoft Corporation. "Microsoft Corporation provides software products for computing devices worldwide. Its Client segment engages in technical architecture, engineering, and product delivery of Windows product family comprising Windows Vista; Windows XP Professional and Home; Media Center Edition; Tablet PC Edition; and other Windows operating systems. The Server and Tools segment offers integrated server infrastructure and middleware software that support software applications and tools built on the Windows Server operating system. Its products include Windows Server operating system; Microsoft SQL Server; Microsoft Enterprise Services; product support services; Visual Studio; System Center products; Forefront Security products; Biz Talk Server; MSDN; and TechNet. The Online Services Business segment offers personal communications services, such as email and instant messaging, and online information through MSN Search; MapPoint; MSN Internet Access; MSN Premium Web Services; Windows Live; and MSN Mobile Services. The

[33]

Microsoft Business Division offers Microsoft office product set consisting of enterprise content management, collaboration, unified communications, and business intelligence products; and Microsoft Dynamics products that provide business solutions for financial management, customer relationship management, supply chain management, and analytics applications. The Entertainment and Devices Division develops, produces, and markets the Xbox video game system, such as consoles and accessories, third-party games, games published under the Microsoft brand, and Xbox Live operations. It also offers Zune digital music and entertainment device; PC software games; online games; Mediaroom, an Internet protocol television software; and other devices. In addition, the company offers online advertising and publishing solutions. It has an alliance with Siemens VDO Automotive AG to develop vehicle navigation system. Microsoft was founded in 1975 and is headquartered in Redmond, Washington [14]." The performance of MSFT can be seen in Figure 4.

Figure 4: MSFT 1 year Performance

The next stock selected was The Hanover Insurance Group, Incorporated. "The Hanover Insurance Group, Inc., through its subsidiaries, provides a range of insurance products and services primarily in the United States. The company primarily offers property and casualty insurance products and services that include personal lines, such as personal automobile,

homeowners, and other personal coverages; and commercial lines, including multiple perils, commercial automobile, workers' compensation, and other commercial coverages, such as bonds and inland marine business. It also engages in the business of financing property and casualty insurance premiums to commercial customers; markets management services to institutions, pension funds, and other organizations; and provides traditional life insurance products, group retirement products, as well as owns and operates a guaranteed investment contract business. The company, formerly known as Allmerica Financial Corporation, was founded in 1844. The Hanover Insurance Group is headquartered in Worcester, Massachusetts [14]." The performance of THG can be seen in Figure 5.
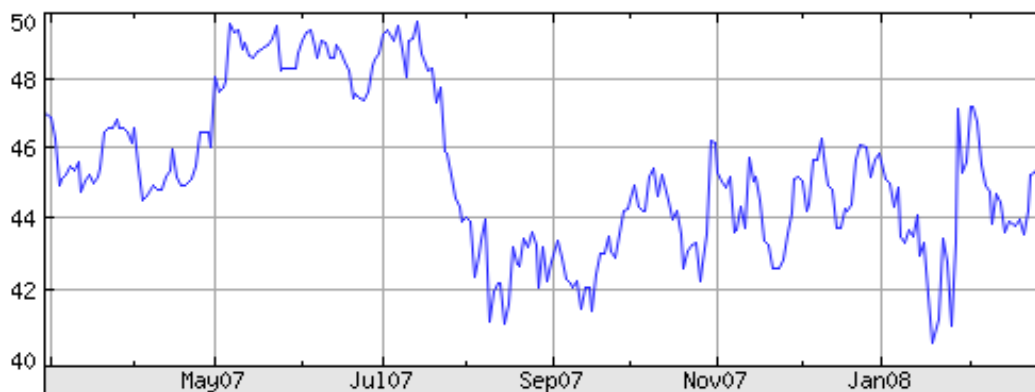
Figure 5: THG 1 year Performance

The next stock selected was Aspen Insurance Holdings Limited. "Aspen Insurance Holdings Limited, through its subsidiaries, provides insurance and reinsurance products and services principally in the United Kingdom, Bermuda, and the United States. It operates through four segments: Property Reinsurance, Casualty Reinsurance, Specialty Insurance and Reinsurance, and Property and Casualty Insurance. Property Reinsurance segment offers treaty catastrophe, which includes protection against losses from earthquakes and hurricanes, as well as from other natural and man-made catastrophes, such as floods, tornadoes, fires, and storms;

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treaty risk excess; treaty pro rata; and property facultative. Casualty Reinsurance segment provides U.S. treaty insurance, which includes workers compensation, medical malpractice, and professional liability for regional lawyers, accountants, architects, and engineers; non-U.S. treaty that consists of automobile liability, workers' compensation, employer's liability, public and product liability, fidelity business, and professional indemnity; casualty facultative that comprises umbrella and general liability. Specialty Insurance and Reinsurance segment offers marine, energy, and liability insurance; aviation insurance; and specialty reinsurance, which consists of marine and aviation reinsurance, as well as terrorism, nuclear, personal accident, crop, and satellite insurance. Property and Casualty Insurance segment includes commercial property insurance; and commercial liability insurance that focuses on employer's liability coverage and public liability coverage. Aspen Insurance Holdings distributes its products through brokers and reinsurance intermediaries. The company was founded in 2002 and is based in Hamilton, Bermuda [14]." The performance of AHL can be seen in Figure 6.

Figure 6: AHL 1 year Performance

The next stock selected was AmCOMP Incorporated. "AmCOMP Incorporated, through its subsidiaries, operates as a property and casualty insurer in the United States. It specializes in

providing workers' compensation insurance products. The company offers insurance coverage for the statutorily prescribed wage replacement and medical care benefits for employees who are injured in the course of their employment. Its loss prevention specialists provide various services, including identifying and eliminating unsafe working conditions, accident and illness prevention, safety awareness training, and sound employee hiring practices. The company's claims management services comprise return-to-work programs, case management by teams of registered nurses and experienced claims adjusters, and management of medical provider services and billings. AmCOMP Incorporated markets and sells its products through independent insurance agents. The company was incorporated in 1995 and is based in North Palm Beach, Florida [14]." The performance of AMCP can be seen in Figure 7.

Figure 7: AMCP 1 year Performance

The next stock selected was Continental Airlines, Inc. "Continental Airlines, Inc., an air carrier, engages in the transportation of passengers, cargo, and mail. As of December 31, 2006, the company's fleet consisted of 366 mainline jets and 272 regional jets. It flew to 136 domestic and 126 international destinations, as well as offered additional connecting service through alliances with domestic and foreign carriers. Continental Airlines operates its domestic route

[37]

system primarily through its hubs at Newark Liberty International Airport in the New York metropolitan area; George Bush Intercontinental Airport in Houston, Texas; and Hopkins International Airport in Cleveland, Ohio. The company directly serves destinations throughout Europe, Canada, Mexico, Central and South America, and the Caribbean, as well as Tel Aviv, Delhi, Hong Kong, Beijing, and Tokyo. Continental Airlines was founded in 1934 and is based in Houston, Texas [14]." The performance of the CAL stock can be seen in Figure 8.
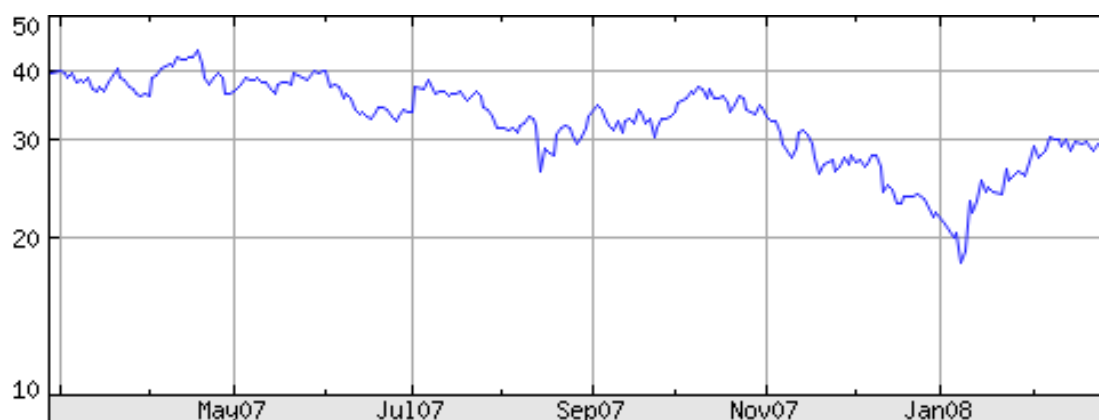
Figure 8: CAL 1 year Performance

The next stock selected was Air France-KLM. "Air France-KLM, through its subsidiaries, provides passenger and cargo transportation services worldwide. The company also engages in aeronautics maintenance and other air-transport related activities, including catering and charter services. As of March 31, 2007, it operated a fleet of 569 aircraft. The company was founded in 1933 and is based in Paris, France [14]."

The next stock selected was E*TRADE Financial Corporation. "E*TRADE Financial Corporation, through its subsidiaries, offers financial solutions to retail and institutional customers worldwide. It provides retail investments and trading, which include automated order placement, and execution of market and limit equity, futures, options, exchange-traded funds,

[38]

mutual funds, and bond orders, as well as offers quick transfer, wireless account access, extended hours trading, quotes, and research and advanced planning tools. The company also offers interest-earning checking, money market, savings, sweep deposit, and certificates of deposit products, as well as provides access to deposit account balances and transactions. In addition, it offers mortgage, home equity, and margin and credit card products; real estate loans; and various consumer loans, including recreational vehicle, marine, commercial, automobile, and credit card loans. The company provides advisory and asset management services to retail clients. E*TRADE Financial primarily provides services through its Web site at www.etrade.com. The company also offers services through its network of customer service representatives, relationship managers, and investment advisors. It provides branded retail Web sites in the United States, Canada, Denmark, Finland, France, Germany, Hong Kong, Iceland, Italy, Sweden, the United Arab Emirates, and the United Kingdom. E*TRADE Financial was founded in 1982 and is based in New York, New York [14]." The performance of ETFC can be seen in Figure 9.

Figure 9: ETFC 1 year Performance

The next stock selected was Group 1 Automotive, Inc. "Group 1 Automotive, Inc. operates in the automotive retail industry. The company markets and sells a range of automotive

[39]

products and services, including new and used vehicles and related financing; vehicle maintenance and repair services; replacement parts; and warranty, insurance and extended service contracts. As of August 3, 2007, it owned and operated 99 dealerships, 136 franchises, and 28 collision service centers in the United States; and 3 dealerships, 6 franchises, and 2 collision centers in the United Kingdom offering 32 brands of automobiles. The company was founded in 1995 and is based in Houston, Texas [14]." The performance of GPI can be seen in Figure 10.

Figure 10: GPI 1 year Performance

The next stock selected was Helen of Troy Limited. "Helen of Troy Limited engages in the design, development, and distribution of brand-name consumer products in North America and internationally. It operates through two segments, Personal Care and Housewares. The Personal Care segment offers hair dryers, straighteners, curling irons, hair setters, women's shavers, mirrors, hot air brushes, home hair clippers and trimmers, paraffin baths, massage cushions, footbaths, body massagers, brushes, combs, hair accessories, liquid hair styling products, men's fragrances, men's deodorants, foot powder, body powder, and skin care products.

[40]

The Housewares segment markets products, including kitchen tools, cutlery, bar and wine accessories, household cleaning tools, tea kettles, trash cans, storage and organization products, hand tools, gardening tools, kitchen mitts and trivets, barbeque tools, and rechargeable lighting products. Helen of Troy Limited sells its products directly, as well as through mass merchandisers, drug chains, catalogs, specialty stores, grocery stores, warehouse clubs, and beauty supply retailers and wholesalers. The company was founded in 1968. It was formerly known as Helen of Troy Corporation and changed its name to Helen of Troy Limited in 1994. Helen of Troy Limited is headquartered in Hamilton, Bermuda [14]." The performance HELE can be seen in Figure 11.

Figure 11: HELE 1 year Performance

The next stock selected was Ambac Financial Group, Inc. "Ambac Financial Group, Inc., through its subsidiaries, provides financial guarantee products and other financial services to clients in the public and private sectors worldwide. It operates in two segments: Financial Guarantee and Financial Services. The Financial Guarantee segment offers financial guarantee insurance and other credit enhancement products, such as credit derivatives for public finance and structured finance obligations. It also provides financial guarantees for bond issues and other

forms of debt financing. This segment sells its products in the U.S. public finance market, the U.S. structured finance and asset-backed market, and the international finance market. The Financial Services segment provides financial and investment products comprising investment agreements, funding conduits, interest rate, currency, and total return swaps, principally to clients of the financial guarantee business, which includes municipalities and other public entities, health care organizations, investor-owned utilities, and asset-backed issuers. The company was founded in 1971 and is headquartered in New York, New York. [14]" The performance of ABK can be seen in Figure 12.

Figure 12: ABK 1 year Performance

The next stock selected was AmeriCredit Corp. "AmeriCredit Corp., an auto finance company, engages in purchasing and servicing automobile sales finance contracts in the United States and Canada. It also originates operating leases on automobiles. The company specializes in purchasing retail automobile installment sales contracts originated by franchised and select independent dealers in connection with the sale of used and new automobiles, as well as in making loans directly to consumers buying new and used vehicles. Its loan servicing activities consist of collecting and processing customer payments; responding to customer inquiries;

[42]

initiating contact with customers who are delinquent in payment of an installment; maintaining the security interest in the financed vehicle; monitoring physical damage insurance coverage of the financed vehicle; and arranging for the repossession of financed vehicles, liquidation of collateral, and pursuit of deficiencies. The company services its loan portfolio at regional centers using automated loan servicing and collection systems. It offers automobile lending programs to customers who have limited access to automobile financing. The company uses a combination of a branch office network and dealer relationship managers to market its indirect financing programs to selected dealers. As of June 30, 2007, it operated a network of 65 branch offices. The company was founded in 1986 and is based in Fort Worth, Texas [14]." The performance of ACF can be seen in Figure 13.

Figure 13: ACF 1 year Performance

The next stock selected was CNA Financial Corporation. "CNA Financial Corporation, through its subsidiaries, provides property and casualty insurance products in the United States. It offers property insurance products, including standard and excess property coverage, marine coverage, and boiler and machinery; and casualty insurance products, such as workers' compensation, general and product liability, and commercial auto coverage to various businesses.

The company also provides property and casualty insurance to small and medium size businesses in Europe, Latin America, Canada, and Hawaii. It offers management and professional liability insurance and risk management services to various professional firms, including architects, realtors, small and mid-sized accounting firms, law firms, and technology firms. In addition, CNA Financial provides small, medium, and large contract and commercial surety bonds; and vehicle warranty service contracts, as well as information and claims administration services. It markets its products and services through independent agents, brokers, managing general agents, and direct sales. The company was founded in 1853 and is based in Chicago, Illinois. CNA Financial Corporation is a subsidiary of Loews Corp [14]." The performance of CNA can be seen in Figure 14.

Figure 14: CNA 1 year Performance

The next stock selected was FirstFed Financial Corp. "FirstFed Financial Corp., operates as a holding company for First Federal Bank of California that provides various banking services in California. The bank engages in generating deposits and originating loans. Its deposit products include passbook, money market deposit, interest-bearing checking, non interest-bearing checking, and fixed-term certificate accounts. The bank's loan portfolio comprises adjustable

mortgage, residential, commercial, industrial, construction, and consumer loans. It also provides trust and insurance brokerage services. As of March 12, 2007, the bank had 33 banking branches and 6 additional lending offices throughout Southern California. FirstFed Financial Corp. was founded in 1929 and is based in Santa Monica, California [14]." The performance of FED can be seen in Figure 15.

Figure 15: FED 1 year Performance

3.1.2 Investment Overview

The Stock Market simulation was run during the time-span from October 1st, 2007 to December 7th, 2007. In this simulation stocks were chosen based on the criteria for value stocks and $20,000 was used to buy the five initial stocks. Each of stock has as many shares bought as possible keeping the total under $4,000. A $10 fee for each trade was also considered for each transaction. All the transactions were recorded in with information such as price, shares, symbol, net costs/proceeds, profit/loss, total cash, and total profit. This information gauged the status of success in the overall simulation.

The chosen stocks were tracked on a daily basis. If the stocks were performing well or not losing much money they ran a course of two to three weeks before being replaced. When a stock needed to be replaced, after sorting stocks by the criteria needed to be a value stock past performance was looked at to determine which stocks were selected. Looking at recent trends it was easy to choose a few new stocks.

When stocks were sold there was also a $10 fee involved. After deducting this fee all of this money was then invested into the new stock. The new stock was then tracked and based on performance was kept or sold. This process occurred until the end of the simulation. At the end of the simulation all stocks were sold and the total was how much money we ended with. Comparing this total with the totals from other investing strategies provides a good comparison for different methods of stock investment.

3.1.3   Technical Analysis

The selection of value stocks took into consideration all of the following: a Price Earnings Ratio (P/E) under 10, a PEG of less than one and a Price to Book ratio of one or less. The first five stocks (ACE, AFG, BER, MSFT and THG) were chosen to meet these criteria. After two weeks I sold four of the stocks (ACE, AFG, BER and THG) because they had made some money and were starting downward trend. I then chose three new stocks (CAL, AHL and AMCP) which met the criteria described above and invested more into MSFT. After three weeks I sold all four of my stocks because their value had been consistently dropping. I picked a new group of four stocks (AKH, ETFC, HELE and GPI) which all fit the criteria considered in selecting a value stock. After two weeks of pretty good performance I sold these stocks to invest

in four new stocks because there was only two more weeks left in the simulation and I wanted to give the new stocks a chance to make money. The new stocks (ABK, ACF, CNA and FED) were chosen because they fit the criteria of a value stock. After two weeks the simulation ended and these stocks were sold. The value stock selection process seemed to work well as a good amount of money was made during this simulation. Of the sixteen value stocks that were selected, only four of them did not make money.

3.1.4   Results

The results of the value investing can be seen in Table 1. Of the sixteen stocks that were selected only four lost money, none lost more than five hundred dollars. The other twelve stocks gained money; eight of them gained over three hundred dollars. This shows that value stocks tend to be a good selection for investors interested in low-risk, low-reward stocks. Over the ten week period the value stocks make almost seven thousand dollars.

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
10/1/2007							$20,000.00	
10/1/2007	ACE	Buy	$60.57	66	$3,997.62		$15,992.38	
10/1/2007	AFG	Buy	$28.52	140	$3,992.80		$11,989.58	
10/1/2007	BER	Buy	$29.63	135	$4,000.05		$7,979.53	
10/1/2007	MSFT	Buy	$29.46	135	$3,977.10		$3,992.43	
10/1/2007	THG	Buy	$44.19	90	$3,977.10		$5.33	
10/12/2007	ACE	Sell	$62.60	66	$4,131.60	$133.98	$4,126.93	$133.98
10/12/2007	AFG	Sell	$29.89	140	$4,184.60	$191.80	$8,301.53	$325.78
10/12/2007	BER	Sell	$31.93	135	$4,310.55	$310.50	$12,602.08	$636.28
10/12/2007	THG	Sell	$45.41	90	$4,086.90	$109.80	$16,678.98	$746.08
10/15/2007	CAL	Buy	$36.75	106	$3,895.50		$12,773.48	
10/15/2007	MSFT	Buy	$30.09	158	$4,754.22		$8,009.26	
10/15/2007	AHL	Buy	$28.54	140	$3,995.60		$4,003.66	
10/15/2007	AMCP	Buy	$10.01	398	$3,983.98		$9.68	
11/9/2007	CAL	Sell	$32.46	106	$3,440.76	($454.74)	$3,440.44	$291.34
11/9/2007	MSFT	Sell	$37.06	293	$10,858.58	$2,127.26	$14,289.02	$2,418.60
11/9/2007	AHL	Sell	$27.30	140	$3,822.00	($173.60)	$18,101.02	$2,245.00
11/9/2007	AMCP	Sell	$9.84	398	$3,916.32	($67.66)	$22,007.34	$2,177.34
11/12/2007	AKH	Buy	$32.70	168	$5,493.60		$16,503.74	
11/12/2007	ETFC	Buy	$3.55	1550	$5,502.50		$10,991.24	
11/12/2007	HELE	Buy	$17.87	308	$5,503.96		$5,477.28	
11/12/2007	GPI	Buy	$29.35	186	$5,459.10		$8.18	
11/23/2007	AKH	Sell	$37.73	168	$6,338.64	$845.04	$6,336.82	$3,022.38
11/23/2007	ETFC	Sell	$4.57	1550	$7,083.50	$1,581.00	$13,410.32	$4,603.38
11/23/2007	HELE	Sell	$17.96	308	$5,531.68	$27.72	$18,932.00	$4,631.10
11/23/2007	GPI	Sell	$28.11	186	$5,228.46	($230.64)	$24,150.46	$4,400.46
11/26/2007	ABK	Buy	$25.55	235	$6,004.25		$18,136.21	
11/26/2007	ACF	Buy	$10.41	577	$6,006.57		$12,119.64	
11/26/2007	CNA	Buy	$33.45	180	$6,021.00		$6,088.64	
11/26/2007	FED	Buy	$31.64	190	$6,011.60		$67.04	
12/7/2007	ABK	Sell	$26.84	235	$6,307.40	$303.15	$6,364.44	$4,703.61
12/7/2007	ACF	Sell	$11.38	577	$6,566.26	$559.69	$12,920.70	$5,263.30
12/7/2007	CNA	Sell	$35.87	180	$6,456.60	$435.60	$19,367.30	$5,698.90
12/7/2007	FED	Sell	$38.41	190	$7,297.90	$1,286.30	$26,655.20	$6,985.20

Table 1: Results of Value Stocks

ACE was purchased on the first day of the simulation, October 1, 2007, and was sold on October 12, 2007. It ended up gaining $2.03 per share, which is a 3.35% increase. Figure 16 shows its performance while it was in the portfolio.

Figure 16: ACE Performance

AFG was purchased on the first day of the simulation, October 1, 2007, and was sold on October 12, 2007. It ended up gaining $1.27 per share, which is a 4.8% increase. Figure 17 shows its performance while it was in the portfolio.

Figure 17: AFG Performance

BER was purchased on the first day of the simulation, October 1, 2007, and was sold on October 12, 2007. It ended up gaining $1.27 per share, which is a 4.8% increase. Figure 18 shows its performance while it was in the portfolio.

Figure 18: BER Performance

AFG was purchased on the first day of the simulation, October 1, 2007, and was sold on November 9, 2007. It ended up gaining $7.60 per share, which is a 25.8% increase. Figure 19 shows its performance while it was in the portfolio.

Figure 19: MSFT Performance

THG was purchased on the first day of the simulation, October 1, 2007, and was sold on October 12, 2007. It ended up gaining $1.22 per share, which is a 2.76% increase. Figure 20 shows its performance while it was in the portfolio.

Figure 20: THG Performance

AHL was purchased on the first day of the simulation, October 15, 2007, and was sold on November 9, 2007. It ended up losing $1.24 per share, which is a 4.54% decrease. Figure 21 shows its performance while it was in the portfolio.

Figure 21: AHL Performance

[53]

AMCP was purchased on the first day of the simulation, October 15, 2007, and was sold on November 9, 2007. It ended up losing $0.17 per share, which is a 1.73% decrease. Figure 22 shows its performance while it was in the portfolio.

Figure 22: AMCP Performance

CAL was purchased on the first day of the simulation, October 15, 2007, and was sold on November 9, 2007. It ended up losing $4.29 per share, which is a 13.22% decrease. Figure 23 shows its performance while it was in the portfolio.

Figure 23: CAL Performance

AKH was purchased on the first day of the simulation, November 12, 2007, and was sold on November 23, 2007. It ended up gaining $5.03 per share, which is a 15.38% increase. Figure 24 shows its performance while it was in the portfolio.

Figure 24: AKH Performance

ETFC was purchased on the first day of the simulation, November 12, 2007, and was sold on November 23, 2007. It ended up gaining $1.02 per share, which is a 28.7% increase. Figure 25 shows its performance while it was in the portfolio.

Figure 25: ETFC Performance

GPI was purchased on the first day of the simulation, November 12, 2007, and was sold on November 23, 2007. It ended up losing $1.24 per share, which is a 4.41% decrease. Figure 26 shows its performance while it was in the portfolio.

Figure 26: GPI Performance

HELE was purchased on the first day of the simulation, November 12, 2007, and was sold on November 23, 2007. It ended up gaining $0.09 per share, which is a 0.5% increase. Figure 27 shows its performance while it was in the portfolio.

Figure 27: HELE Performance
[58]

ABK was purchased on the first day of the simulation, November 26, 2007, and was sold on December 7, 2007. It ended up gaining $1.29 per share, which is a 5.04% increase. Figure 28 shows its performance while it was in the portfolio.

Figure 28: ABK Performance

ACF was purchased on the first day of the simulation, November 26, 2007, and was sold on December 7, 2007. It ended up gaining $0.97 per share, which is a 9.31% increase. Figure 29 shows its performance while it was in the portfolio.

Figure 29: ACF Performance

CNA was purchased on the first day of the simulation, November 26, 2007, and was sold on December 7, 2007. It ended up gaining $2.42 per share, which is a 7.23% increase. Figure 30 shows its performance while it was in the portfolio.

Figure 30: CNA Performance

FED was purchased on the first day of the simulation, November 26, 2007, and was sold on December 7, 2007. It ended up gaining $6.77 per share, which is a 21.4% increase. Figure 31 shows its performance while it was in the portfolio.

Figure 31: FED Performance

3.2　*Growth Investing*

This section will outline the entire process of the ten-week simulation for our portfolio containing growth stocks. It shows all of the stocks selected and the final results for each stock.

3.2.1　Selection

The ideal growth stock is as follows; EPS growth is above 5%, projected growth rate is above 10% (made by analysts), return on equity is greater than 15%, and a debt to equity ratio is below 0.2 [5].

The first stock chosen was TiVO Incorporated. The company makes the popular television recording devices that are becoming a necessity in many people's homes. They began with the simple units that could record shows like a VCR but in a digital format. Now they've progressed to all-purpose units with network capabilities, DVD burning, and a much improved user interface. TiVO produces one of the most ground-breaking and iconic devices in the technology industry over the past five years [14]. The company's shares had great value years back but have fallen into a lower, yet consistent, trend. Lately, with the further development of units and the increasing popularity, the company has exhibited a growth trend. The shares are very cheap and have much room for growth. The chart showing its past performance is shown below in Figure 32.

Figure 32: TIVO 1 Year

The next stock chosen was FMC Technologies Inc. The company is based out of Houston, TX and Chicago, IL. They produce mostly oilfield equipment in Houston. The Chicago branch focuses on machinery and food equipment. They also produce a popular line of airplane passenger loading bridges [14]. This was by far the most expensive stock purchased, which is usually not a strong point for growth stocks, but it exhibited many characteristics that

would lend it to this strategy. The chart of its past year's performance is shown below in Figure 33.

Jan 29th, 2007 Open: 29.87 High: 30.21 Low: 29.40 Close: 29.625

Figure 33: FTI 1 Year

The third stock selected in this portfolio is Cenveo Inc. They are a communication services company that offers both print and visual communications. The print side of their company caters to businesses for envelopes, letterheads, and other such products. The other side is focused around presentation materials and advertising. They're headquartered in Stamford, CT [14]. Their chart of the last year is shown below in Figure 34.

Jan 29th, 2007 Open: 22.96 High: 23.49 Low: 22.91 Close: 23.45

Figure 34: CVO 1 Year

[63]

The fourth stock from the first transaction in this portfolio is Warren Resources Inc. The company was founded and is based in New York. Their business ventures are focused in the western half of the country. They develop natural gas reserves in the Rocky Mountain region [14]. Their past year's chart is below in Figure 35.
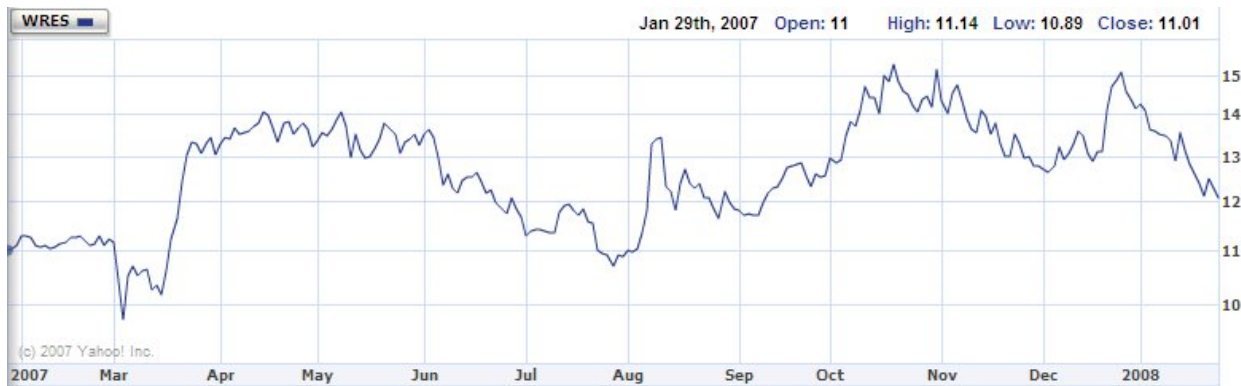
Figure 35: WRES 1 Year

The final stock from the first purchase in this portfolio is Fortress Investment Group LLC. They are a public investment management firm. The firm is based in New York City but has offices all over the world. They've been in business since 1998[14]. Their performance chart for the past year is below in Figure 36.

Figure 36: FIG 1 Year

[64]

After all of the stocks from that first purchase were sold, five new stocks were selected. The first of which was American Eagle Outfitters. They are a clothing company with retail stores all over North America. The company was founded in 1972 and is headquartered in Pittsburgh, Pennsylvania. Now, they operate over 900 stores to sell their products that are geared towards teens and young adults [14]. The performance chart for the past year is shown in Figure 37.

Figure 37: AEO 1 Year

The second stock selected for this purchase was Sunoco, Inc. The company was started in 1886 and is now based in Philadelphia, Pennsylvania. They manufacture and market both petroleum products and various chemicals. They own thousands of miles of pipelines for refining their oil and have many plants which manufacture the chemicals they provide. Many gas stations have been established by the company across the country [14]. Figure 38 shows the stock's performance over the past year.

Figure 38: SUN 1 Year

TD Ameritrade Holding Company was the third stock selected in this transaction. They are a brokerage firm that provides financial services in the United States. Their primary means of brokerage is via their website. This method has taken over as the favorite as the internet has developed. They offer an array of services that cater to a wide variety of investors. Everyone from casual, low-investment buyers to CEOs of major corporations have a means of investing through this company. They've been around since 1971 and are based in Omaha, Nebraska [14]. Their past year's performance is shown below in Figure 39.

Figure 39: AMTD 1 Year

Nutrisystem, Inc. was the fourth stock involved in this purchase. They offer weight management products and services. The products offered are often sold in month supplies and contain all the food necessary for a person on their diet system during that time. In addition, they offer a counseling service both over the telephone and in person for weight-loss purposes. They were founded in 1972 and are headquartered in Horsham, Pennsylvania [14]. Figure 40 shows the stock's performance over the past year.

Figure 40: NTRI 1 Year

Reliance Steel and Aluminum Co. was the final stock selected in this second purchase. They operate over 160 metal processing plants internationally. They're in the business of processing services and distribution of over 100,000 metal products. They offer a plethora of metal processing services, such as bending, machining, threading, and welding. They were founded in 1939 and are now based in Los Angeles, California [14]. Their performance over the past year is shown in Figure 41.

Figure 41: RS 1 Year

Hewlett Packard Co. was the first stock in the final purchase group. They provide many services and products. Their products range from personal computers and networking equipment to IT services and end-user software solutions. This is one of the larger and more successful companies that was selected as a growth stock. They also have an entire division that is dedicated to imaging and printing products that is very successful. They were founded in 1939 and are based in Palo Alto, California [14]. Their past performance is displayed in Figure 42.

Figure 42: HPQ 1 Year

The second stock of this final set was Qualcomm Incorporated. They design and manufacture many products for use in mobile technologies. They make integrated circuits for

use in devices such as cell phones and GPS units, as well as software for similar applications. They focus around their CDMA technology, which allows many products to wirelessly transmit and receive data. They also designed one of the leading technologies for internet on mobile phones. They were founded in 1985 and are headquartered in San Diego, California [14]. Figure 43 below illustrates the stock's performance over the past year.

Figure 43: QCOM 1 Year

The third stock in this set was UnitedHealth Group Incorporated. They provide health care services in the United States. They have options for individuals, companies, and even school plans. Their biggest sector is their employee benefit offerings. They were founded in 1974 and are now based in Minnetonka, Minnesota [14]. Their past performance is shown in Figure 44.

UNH ▬   Jan 29th, 2007 Open: 51.35 High: 52.01 Low: 51.35 Close: 51.73

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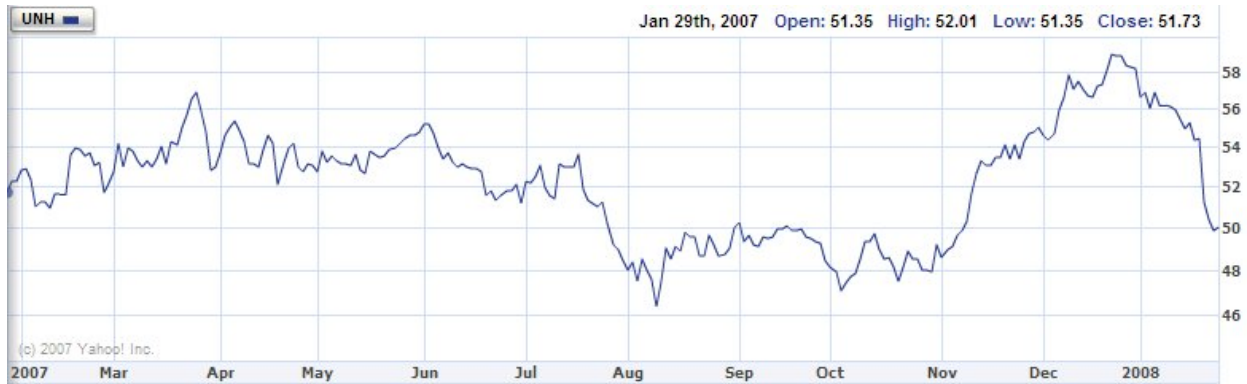
Figure 44: UNH 1 Year

The fourth stock in this purchase was The Walt Disney Company. They operate in many different segments. They own many television stations, including The Disney Channel and ABC Family. They also own and operate over 40 radio stations, including Radio Disney and ESPN Radio. They have their theme park segment that operates their various large parks including the hotels and resorts. They have a cruise line for families. Their licensing section spreads their popular trademarked characters around into different mediums, such as video games and books. They also have a live show branch that produces a few different kinds of shows for different entertainment venues such as the Disney on Ice series. A very large portion of their company is their movie division that produces both feature films and made-for-TV movies. They were founded in 1923 and are based in Burbank, California [14]. Their performance over the past year is charted in Figure 45.

Figure 45: DIS 1 Year

The final stock purchased was Cadence Design Systems, Inc. They design software that allows users to design and develop integrated circuits and other electronic systems. They offer various software solutions, such as a package that is geared towards implementing a circuit in a nanometer-scaled solution. They were founded in 1983 and are now headquartered in San Jose, California [14]. Figure 46 is the chart of the past year for this company.

Figure 46: CDNS 1 Year

3.2.2   Investment Overview

This portfolio was created using the same $20,000 limit that the other simulations used. We did not restrict ourselves in how we invested here, but ended up using the standard strategy

of investing in five stocks evenly. The transactions occurred whenever we felt it was necessary, and resulted in emptying out the portfolio and rebuilding from scratch.

The ten week simulation was completed in early December. The stocks that were purchased were selected because of their performance at the time of purchase. As the portfolio was tracked daily throughout the simulation, its performance was monitored. This often was not as strong as expected and that caused the occasional revamp of the entire set. They were monitored by both charts and tables showing their profits. The tables enabled us to see exact numbers to determine their progress and the charts showed an overall trend that was very useful in judging their usefulness. None of the stocks over the period showed a strong positive trend, and therefore, none of the stocks stayed in the portfolio for very long.

The common theme here was mediocrity. Almost every single stock that was invested in refused to perform exceptionally. Any stocks that did gain over their stay in the portfolio did not turn a very large profit. However, luckily, the same was true for damage done by stocks that lost money.

3.2.3   Technical Analysis

The technical analysis for this portfolio was done with the help of Bollinger Bands. These bands are placed on the chart of the stock to depict the value plus or minus two standard deviations throughout the period of the chart. It is said that a good selling point is when the stock crosses below the lower line, whereas a good buying point is when the stock surpasses the upper line. This is essentially saying buy when a stock is performing well and sell when it is losing. These charts are occasionally used by traders to make buying and selling decisions.

These charts were not considered during the ten-week simulation, so the actual buy and sell dates may not line up with what the charts recommend, but this is a good way to compare the actions of the simulation to a popular, modern stock-trading strategy. Also, the simulation for these growth stocks was done in waves. The stocks were bought and sold all together. Therefore, using Bollinger Bands during the simulation would likely have changed our actions.

TiVO was bought when the stock was above the upper band. However, as it was on the decline, we sold the stock. It was approaching the lower band, but it was sold with all of the first round stocks on that day. This probably saved us money, rather than waiting for it to dip even lower before selling. The chart showing this is below in Figure 47.

Figure 47: TIVO Bollinger Bands

FTI was traded under very similar circumstances to TiVO. It was purchased while the stock was near the upper band. As it plummeted in its final days in the portfolio, we sold it preemptively. This, again, most likely saved us a bit of money. The Bollinger Bands for FTI are shown in Figure 48.

[73]
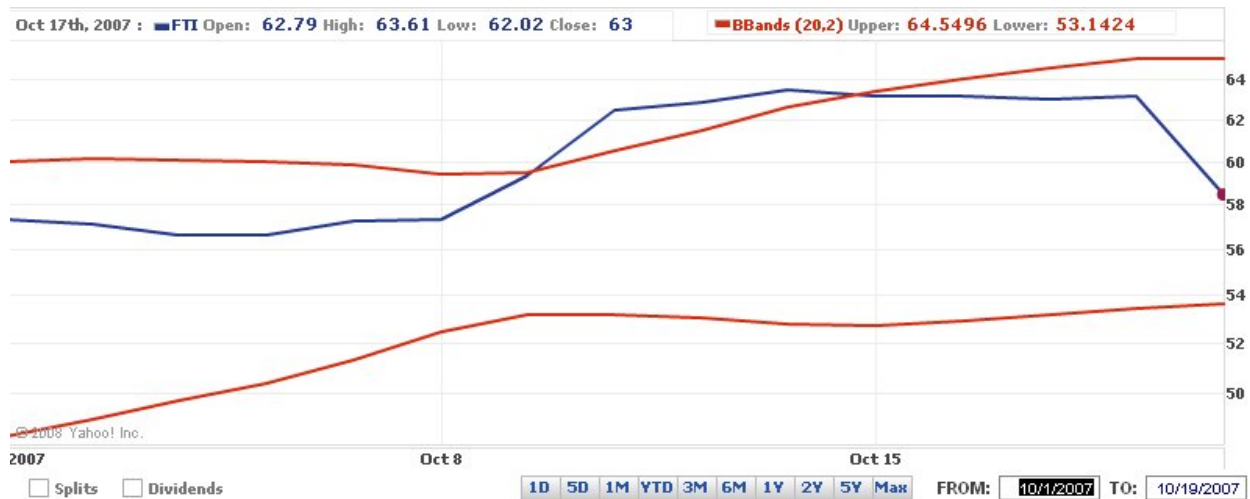
Figure 48: FTI Bollinger Bands

The Bollinger Bands in Figure 49 for CVO also show a similar buy/sell trend. It was purchased above the top band and sold about half-way down on its plummet in the final few days of its stay in the portfolio.

Figure 49: CVO Bollinger Bands

The situation for WRES was a bit different from the prior three stocks. It started much the same, being bought right near the top band. However, its performance differed from the

others, in that it kept on gaining so that it hovered around the top band for a while. When it was sold, it was still up there. Even though the strategy does not match here, that is a profitable play. The only thing that can be said, though, is that if it was held onto, it may have made even more money. That probably would have been the case. Figure 50 shows the Bollinger Bands for WRES.

Figure 50: WRES Bollinger Bands

FIG was another stock that was purchased at a high point and sold as it crashed down towards the lower band. Again, this probably saved us money compared to waiting for it to drop below the band. The bands are shown below in Figure 51.

[75]
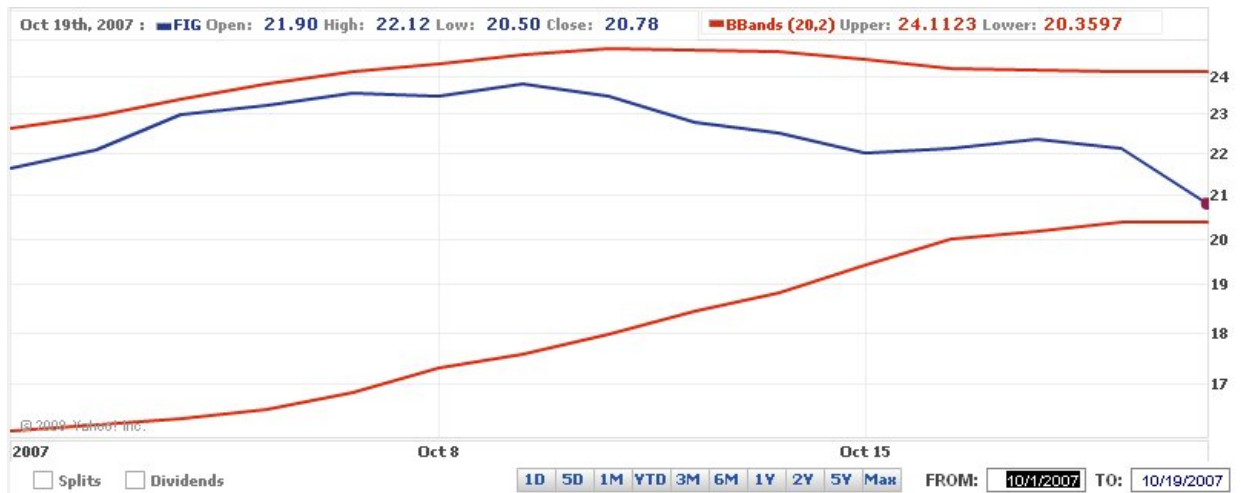
Figure 51: FIG Bollinger Bands

This is the first stock we purchased near the lower band. AEO then began to head up towards the upper band, but ended up floating around the middle for the remainder of the time we owned it. It did not cross either band the entire time it was in the portfolio. The chart is below in Figure 52.

Figure 52: AEO Bollinger Bands

Sunoco was purchased while it was between the bands. It remained there for most of the time. It did cross below the lower line once, which indicates a selling situation, but it was held onto. That worked out in our favor because it rebounded after that and climbed about three dollars higher than we would have sold it at. The bands are shown in Figure 53.

Figure 53: SUN Bollinger Bands

TD Ameritrade acted exactly the same as Sunoco. It was purchased in the middle, dipped below the bottom band but was held onto, and then gained some money before we actually sold it. The chart is shown below in Figure 54.

Figure 54: AMTD Bollinger Bands

Nutrisystem was purchased in the middle of the bands as well. The bands narrowed very quickly for this stock and caused the stock to hover around the lower band for a long time. If we had sold it the first time it crossed the lower band, we could have saved a bit of money. However, this is the first time this is true, so that strategy would not have always helped. Therefore, using it probably would have lost us more money than it would have gained. The chart for NTRI's Bollinger Bands is in Figure 55.

Figure 55: NTRI Bollinger Bands

Reliance Steel stayed between the bands for most of the time. It did dip below the lower band near the end, and had we sold there, we may have saved a very small amount of money. Overall, this stock was sold at a very reasonable spot, even though it lost money. The chart showing this is in Figure 56.

Figure 56: RS Bollinger Bands

Hewlett-Packard was purchased near the middle of the bands and began to grow. It reached up and hit the upper band shortly before being sold. The stock never came very close to the lower band. This transaction favored us by selling near its peak. The chart is below in Figure 57.

Figure 57: HPQ Bollinger Bands

Qualcomm was purchased in the middle of the bands and managed to stay pretty steady in there for the duration. When it was sold, it was almost perfectly in the center of the bands. The chart is shown in Figure 58.

Figure 58: QCOM Bollinger Bands

UnitedHealth stayed near the top band for the entire time. It was purchased when it was just underneath it, and was sold right after it had crossed above it. This did make us money, albeit a relatively small amount. The chart is shown in Figure 59.

Figure 59: UNH Bollinger Bands

Disney was purchased underneath the lower band, but it quickly rose above it. From there, it kept increasing towards the upper band. It began to level out and was sold between the bands, but closer to the upper. This chart is shown in Figure 60.

Figure 60: DIS Bollinger Bands

CDNS was bought in the middle and it stayed in the middle. It was a very average stock the entire time and never really made any significant change, for better or worse. The chart depicting this is below in Figure 61.

Figure 61: CDNS Bollinger Bands

3.2.4 Results

TiVO was purchased on the first day of the simulation, October 1, 2007, and was sold on October 19, 2007. It ended up gaining $0.20 per share, which is a 3.12% increase. Any profit is acceptable, so although this is a relatively small gain, the stock performed favorably. Figure 62 shows its performance while it was in the portfolio.

Figure 62: TIVO Performance Chart

[83]

FTI was in the first purchase set, lasting in the portfolio from October 1, 2007 to October 19, 2007. The stock lost $0.06 per share over that period, which is a 0.1% loss. That's a very small loss, resulting in just over $4 overall. Therefore, it essentially broke even. The chart of its performance over that period is shown below in Figure 63.

Figure 63: FTI Performance Chart

CVO was purchased on October 1, 2007 and was sold on October 19, 2007 for a loss of $0.25 per share. That is a 1.16% loss. That isn't too big of a hit for our portfolio, as we are still turning a profit overall at this point. The chart showing this performance slump is below in Figure 64.

Figure 64: CVO Performance Chart

WRES was purchased on October 1, 2007 and was sold on October 19, 2007. This was the best performing stock in this set. It posted a profit of $2.23, which is a 17.74% gain. That is very high for owning it just three weeks. This gain pushed us even further into the green, leaving our total profit at about $783. This stock alone accounted for about $709 of that. The chart showing this growth is below in Figure 65.

Figure 65: WRES Performance Chart

FIG was purchased on October 1, 2007 and sold on October 19, 2007. This stock posted a small loss of $0.37 per share. That is a 1.75% loss. This again is fairly small and only affects the portfolio to a small degree. Nonetheless, the majority of our stocks in this first selling of stocks have posted losses. We were saved by one monster gain, but we can't rely on anything like that in the future. The chart showing the performance of FIG is in Figure 66.

Figure 66: FIG Performance Chart

After the sale of all of the initial stocks, American Eagle was purchased on October 22, 2007 and was kept until November 16, 2007. When it was sold on that date, it posted a loss of $0.30 per share, which is about a 1.34% decline. This results in us losing about $55 on this stock. This also continues our trend of small losses. Its chart for that period is shown below in Figure 67.

Figure 67: AEO Performance Chart

Sunoco was purchased on October 22, 2007 and was sold on November 16, 2007. At the time of sale, it had gained $0.94 per share since its addition. This is a welcome victory after so

many poor-performing stocks, even though it's only a 1.33% gain. Its chart is shown below in Figure 68.

Figure 68: SUN Performance Chart

TD Ameritrade was purchased on October 22, 2007 and sold on November 16, 2007. It also posted a gain of $0.95 per share. However, this resulted in a much bigger profit because that gain is about 5.15%. This added over $200 to our overall total profit, which now stands around $926. Overall, this portfolio has been performing very well. The chart for AMTD is shown below in Figure 69.

Figure 69: AMTD Performance Chart

[87]

NutriSystem was purchased on October 22, 2007 and was sold on November 16, 2007. This stock plummeted while in the portfolio and was devastating to our net worth. Over the four weeks it was in the portfolio, it lost $4.17 per share. That equates to a 15.16% loss, totaling over $630 in damage. This devastated our profits, but we are still above even. Its poor performance is illustrated in Figure 70 below.

Figure 70: NTRI Performance Chart

The final stock in this set was Reliance Steel. It was purchased on October 22, 2007 and sold on November 16, 2007. This stock also lost money, dropping $2.40 per share. That is equal to a 4.59% decline. That loss combined with the previous one has left all of our big gains shattered. We are lucky to still be profitable, standing at around $100 above even. The chart for Reliance is below in Figure 71.

Figure 71: RS Performance Chart

The first stock in this final set was Hewlett Packard. It was purchased on November 19, 2007 and sold on December 7, 2007. When sold, it had gained $2.40 per share since the time of purchase, which is a 4.85% increase. This helped our portfolio immensely after those crippling losses. The chart depicting this gain is shown below in Figure 72.

Figure 72: HPQ Performance Chart

Qualcomm was purchased on November 19, 2007 and was sold on December 7, 2007. When sold, it had lost $1.63 per share, which is about 3.9%. This loss almost completely negates the previous gain. Still, however, we are profiting. The chart showing Qualcomm's progress over those last three weeks is in Figure 73 below.

[89]

Figure 73: QCOM Performance Chart

UnitedHealth was purchased on November 19, 2007 and was sold on December 7, 2007. It, at time of sale, had gained $3.16 per share, which is about 5.9%. This was a big gain for us as this simulation came to a close. It pushed our profit up to over $370. The chart showing UnitedHealth posting large gains in the very last week is shown below in Figure 74.

Figure 74: UNH Performance Chart

Disney was purchased on November 19, 2007 and was sold on December 7, 2007. This stock also posted a large gain, rising $1.54 per share. That's a 4.93% gain. This, being the second-to-last stock to be sold in the simulation, put us into a healthy overall gain of around $576. The chart depicting its progress over that period of time is shown below in Figure 75.

[90]

Figure 75: DIS Performance Chart

Cadence Design was purchased on November 19, 2007 and was sold on December 7, 2007. This stock posted a modest gain of $0.32 per share, equaling 1.92%. This just adds to our profit, leaving us with a decent sum at the end. The graph of progress for this stock is shown below in Figure 76.

Figure 76: CDNS Performance Chart

After all three sets of stocks got their time to make money, our results were very positive. We finished with an overall gain of over $650. That isn't a monstrous gain, but very acceptable because of the nature of the market. It amounts to about a 3.3% profit over ten weeks. Ten weeks is a very short simulation for a market of this nature, so any profit is a considerable

[91]

victory. Table 2 shows a complete summary of all transactions that occurred within this simulation.

DATE	SYMBOL	BUY/ SELL	PRICE	SHARES	NET COST/PROCEEDS	PROFIT/ LOSS	TOTAL CASH	TOTAL PROFIT
10/1/2007	TIVO	Buy	$6.39	625	$3,993.75		$16,006.25	
10/1/2007	FTI	Buy	$58.47	68	$3,975.96		$12,030.29	
10/1/2007	CVO	Buy	$21.57	185	$3,990.45		$8,039.84	
10/1/2007	WRES	Buy	$12.57	318	$3,997.26		$4,042.58	
10/1/2007	FIG	Buy	$21.15	189	$3,997.35		$45.23	
10/19/2007	TIVO	Sell	$6.59	625	$4,118.75	$125.00	$4,163.98	$125.00
10/19/2007	FTI	Sell	$58.41	68	$3,971.88	($4.08)	$8,135.86	$120.92
10/19/2007	CVO	Sell	$21.32	185	$3,944.20	($46.25)	$12,080.06	$74.67
10/19/2007	WRES	Sell	$14.80	318	$4,706.40	$709.14	$16,786.46	$783.81
10/19/2007	FIG	Sell	$20.78	189	$3,927.42	($69.93)	$20,713.88	$713.88
10/22/2007	AEO	Buy	$22.45	184	$4,130.80		$16,583.08	
10/22/2007	SUN	Buy	$70.55	58	$4,091.90		$12,491.18	
10/22/2007	AMTD	Buy	$18.43	224	$4,128.32		$8,362.86	
10/22/2007	NTRI	Buy	$27.50	152	$4,180.00		$4,182.86	
10/22/2007	RS	Buy	$52.31	79	$4,132.49		$50.37	
11/16/2007	AEO	Sell	$22.15	184	$4,075.60	($55.20)	$4,125.97	$658.68
11/16/2007	SUN	Sell	$71.49	58	$4,146.42	$54.52	$8,272.39	$713.20
11/16/2007	AMTD	Sell	$19.38	224	$4,341.12	$212.80	$12,613.51	$926.00
11/16/2007	NTRI	Sell	$23.33	152	$3,546.16	($633.84)	$16,159.67	$292.16
11/16/2007	RS	Sell	$49.91	79	$3,942.89	($189.60)	$20,102.56	$102.56
11/19/2007	HPQ	Buy	$49.44	81	$4,004.64		$16,097.92	
11/19/2007	QCOM	Buy	$41.75	96	$4,008.00		$12,089.92	
11/19/2007	UNH	Buy	$53.49	75	$4,011.75		$8,078.17	
11/19/2007	DIS	Buy	$31.25	129	$4,031.25		$4,046.92	
11/19/2007	CDNS	Buy	$16.69	241	$4,022.29		$24.63	
12/7/2007	HPQ	Sell	$51.84	81	$4,199.04	$194.40	$4,223.67	$296.96
12/7/2007	QCOM	Sell	$40.12	96	$3,851.52	($156.48)	$8,075.19	$140.48
12/7/2007	UNH	Sell	$56.65	75	$4,248.75	$237.00	$12,323.94	$377.48
12/7/2007	DIS	Sell	$32.79	129	$4,229.91	$198.66	$16,553.85	$576.14
12/7/2007	CDNS	Sell	$17.01	241	$4,099.41	$77.12	$20,653.26	$653.26

Table 2: Transaction Summary for Growth Stocks

3.3   GARP Investing

This section will cover the selection, investment overview, technical analysis, and results using the GARP strategy for investing. The selection of the stocks is based on a set of criteria outlined in Chapter 3.3.1, which is used to filter stocks. The investment overview will describe the process as a whole. A technical analysis will be performed using Bollinger Bands as a guide and the results will quantify the investment strategy.

3.3.1   Selection

GARP stock selection is a somewhat confusing process. An investor looks for many of the characteristics of both growth and value investing. The ideal GARP stock is a compromise between growth and value traits such as follows; a P/E ratio from 15-25, a PEG of about .50 which indicates that the stock is undervalued and has growth potential, an earnings growth rate between 10-20%, a P/B ratio that is low and if possible below industry average, and a high ROE figure [10].

To search for stocks we used filters to narrow our search results so we could better find a company that fit the profile we were looking for. We first began by searching for companies that had a P/E ratio between 15 and 25. This gave us a large number of stocks that did not fit the other criteria. We then filtered these stocks for a PEG less than 1. This narrowed our results even further but we were still not satisfied. We then searched for stocks with a 5 year earnings growth above 10%. After this search we were confident that we could find good stocks with earning potential. We sorted the results by PEG and tried to select stocks that had as close to a .5 as possible, while also looking at their P/E ratio and earnings growth. The five stocks that we selected are listed in the table below [14].

		Shares	Price Per Share
FBTX	Franklin Bank Corp	433	9.20
BRP	Brasil Telecom Participacoes S/A	53	74.62
CRK	Comstock Resources Inc.	129	30.84
AAON	AAON Inc.	202	19.73
SCRX	Sciele Pharma Inc.	153	26.02
Value			19883.34

Table 3: Original GARP Stock Selection

The first stock that we selected was the Franklin Bank Corp (FBTX). This stock was selected because it had a very good PEG even though its' earnings potential was a little high; we still feel it was a good selection. This is the holding company of the Franklin Bank, S.S.B., which is a savings bank that operates 37 offices throughout Texas. This company, which operates in the financial sector of the market, in the industry of Savings & Loans, had a market cap of 237.28M, and an enterprise value of 2.02 B. They are members of the S&P 600 SmallCap and the S&P 1500 Super Comp. The bank provides service to the community and commercial customers through many different options. The company employs 627 fulltime employees in these offices which provides consumer banking products, including checking, money market, and savings accounts, certificates of deposit, auto loans, home improvement loans, home equity loans, and mortgage loans, as well as investment services. The company, formerly known as BK2, Inc., was founded in 1993 and is based in Houston, Texas [14].
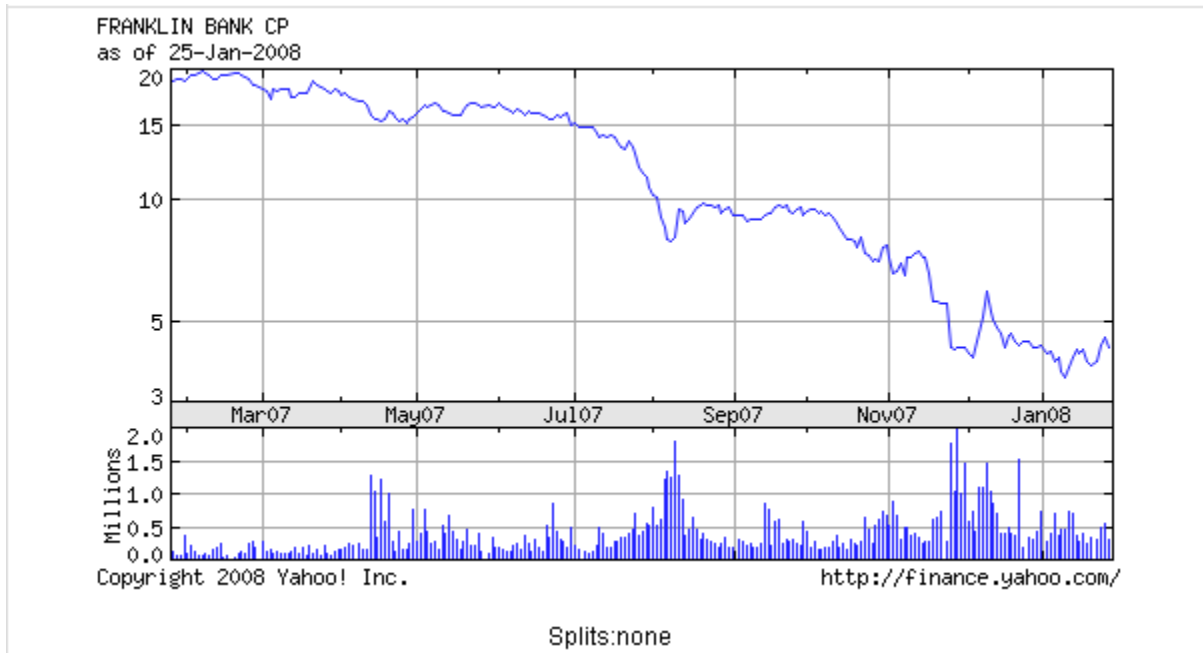
Figure 77: FBTX 1 Year Value

The second GARP stock that was selected was Brasil Telecom Participacoes S/A (BRP). We selected this stock based on the fact that it met all of the criteria; PEG, P/E ratio, earnings growth and seemed to have a good history. Brasil Telecom Participacoes S/A is in the Technology sector of the market and in the industry of Telecom Services - Foreign. The company has a total Market Cap of roughly of 5.66 billion and an enterprise value of 6.20 billion. This company is a holding company that provides fixed-line telecommunications in Brazil. They offer local fixed-line telecommunications services, including calls that originate and terminate within a single local area. They also provide installation, monthly subscription, public telephones, and supplemental local services. Along with these services they also provide international long distance calling, wireless services, data transmission, and network services. The company boasts about 3.4 million mobile users, 8.4 million local fixed-lines, and about 275,000 public telephones.

[95]

The company was founded in 1998 but it was formerly known as Tele Centro Sul Participacoes S.A. and changed its name to Brasil Telecom Participacoes S.A. in 2000 [14].

Figure 78: BRP 1 Year Value

Comstock Resources Inc. (CRK) was the third stock that we selected. We selected this stock because it had a very good PEG, an earnings growth on the lower end of what we were looking for, and a P/E ratio on the high end of what we were looking for. It is in the Basic Materials sector of the market, in the industry of Independent Oil &Gas, and has 130 fulltime employees. The company had a Market Cap of 1.53 billion and an Enterprise value of 2.09 billion. This company specializes in on and offshore operations of oil and natural gas wells and owns about 1800 producing wells. The company currently explores, acquires, develops, and produces natural gas and oil onshore Texas and Louisiana. It also has offshore operations in the Gulf of Mexico and has in its reserves about 32,500 million barrels of oil and 657,000 million cubic feet of natural gas. The company was founded in 1919 and is based in Frisco, Texas [14].

[96]

Figure 79: CRK 1 Year Value

The fourth stock that was selected by the group was AAON Inc. (AAON). We selected this stock because it met the all of the criteria fairly well. It was not the ideal choice but was more than acceptable. This company is in the Industrial Goods sector of the market and in the General Building Materials industry. This company operates with 1,368 full time employs, is based out of Tulsa, Oklahoma, and was founded in 1987. It has a Market Cap of 387 million and an Enterprise value of 384 million. AAON Inc. specializes in the manufacturing and sales of air-conditioning and heating equipment. The company's products are used for commercial and industrial purposes and are mainly distributed to property owners and contractors. The company's product line includes; standardized and custom rooftop units, chillers, make-up air units, heat recovery units, air-handling units, condensing units, and boilers [14].

[97]

Figure 80: AAON 1 Year Value

The last stock that we chose for GARP investing was Sciele Pharma Inc. (SCRX). The

group chose this stock because it had a very good PEG and P/E ratio, but it also had a higher

than normal earnings percent that we decided would be interesting to see how it faired compared

to the other stocks.   Sciele Pharma Inc. is in the Healthcare sector and in the Drug

Manufacturers- other industry. This company is also a part of the S&P 600 SmallCap and the

S&P 1500 Super Comp. Sciele Pharma Inc. is a pharmaceutical company that employs 782

people to develop, market, and sell prescription products for cardiovascular/diabetes diseases and

women's health. The company has a Market Cap of 989 million and an Enterprise value of 1.08

billion. Some of their products include Sular, Fortamet, Altoprev, Triglide, and Nitrolingual

spray, which are sold to wholesalers, chain drug stores, other retail merchandisers, and directly to

pharmacies. The company was founded in 1992 in Atlanta, Georgia and was formally known as

[98]

First Horizon Pharmaceutical Corporation, but changed its name to the present name in 2006 [14].

Figure 81: SCRX 1 Year Value

On October 18th, the first trade was made for the GARP simulation. All 433 shares of FBTX were sold for $8.05 per share. The shares were sold because the stock value had been decreasing over a period of time. With the money gained from the sale of those shares, a purchase of 10 shares of RTP at $354.45 per share was completed on the same day. The third trade was made on October 26th where 202 shares of AAON were sold for $17.79. These shares again were not performing as expected so they were sold. On the same day 121 shares of TWGP for $29.39. The fifth trade done for the GARP simulation was the selling of 153 shares of SCRX at $23.38 per share and November 2nd. This stock was showing no signs of improvement and had only declined in price since it was bought. The money gained from this trade was used to buy 1096 shares of ITI at $3.26 per share on the same day. The seventh trade was the sale of 53

shares of BRP on November 7th for a price of $75.73. This stock had been down for a period and rose dramatically so the decision was made to sell and cut losses. The money that was gained from this trade was used to buy 876 shares of NOVA for $4.56 per share. An overview of all the trades can be seen in the figure below.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total Profit
10/1/2007							$40,000.00	
10/1/2007	FBTX	Buy	$9.20	433	$3,993.60		$36,006.40	
10/1/2007	BRP	Buy	$74.62	53	$3,964.86		$32,041.54	
10/1/2007	CRK	Buy	$30.84	129	$3,988.36		$28,053.18	
10/1/2007	AAON	Buy	$19.73	202	$3,995.46		$24,057.72	
10/1/2007	SCRX	Buy	$26.02	153	$3,991.06		$20,066.66	
10/1/2007	ATIBX	Buy	$16.02	623	$9,990.46		$10,076.20	
10/1/2007	ACDVX	Buy	$21.95	455	$9,997.25		$78.95	
10/18/2007	FBTX	Sell	$8.05	433	$3,475.65	($517.95)	$3,554.60	-$517.95
10/18/2007	RTP	Buy	$354.45	10	$3,554.50		$0.10	
10/26/2007	AAON	Sell	$17.79	202	$3,583.58	($411.88)	$3,583.68	-$941.87
10/26/2007	TWGP	Buy	$29.39	121	$3,566.19		$17.49	
11/2/2007	SCRX	Sell	$23.38	153	$3,567.14	($423.92)	$3,584.63	-$1,353.75
11/2/2007	ITI	Buy	$3.26	1096	$3,582.96		$1.67	
11/7/2007	BRP	Sell	$75.73	53	$4,003.69	$38.83	$4,005.36	-$1,314.92
11/7/2007		Buy	$4.56	876	$4,004.56		$0.80	

Figure 82: GARP Stock Transactions

Rio Tinto plc (RPT) was bought on 10/18 after FBTX was sold. It is a company that finds, mines, and processes mineral resources. They have a market cap of $153.61B and an enterprising value of $156.22B. They are based out of London but work around the world. The company was founded in 1873 and operates as a subsidary of the Rio Tinto Group. Some of their products include aluminum, copper, gold, and diamonds. They also produce energy products; such as coal and uranium; industrial minerals, including borax, titanium dioxide, salt, and talc; and iron ore which are found primarily in North America, Europe, Asia, Australia, and New Zealand [14].

RIO TINTO ADR
as of 25-Jan-2008

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Splits:none

Figure 83: RPT 1 Year Value

Tower Group Inc (TWGP) was purchased on 10/26 after AAON was sold. The company has a market cap of $708.05M and an enterprising value of $744.12M. This company, through its subsidiaries offers various forms of insurance, reinsurance, and insurance services to businesses and individuals. The company operates in New York, New Jersey, Massachusetts, and Pennsylvania, but is based out of New York City. The company was founded in 1989. The company offers specialized property and casualty insurance to its customers [14].

[101]

Figure 84: TWGP 1 Year Value

Iteris Inc (ITI) was acquired on 11/2 after SCRX was sold. This company is based in Anaheim, CA and was founded in 1969 under the name of Odetics, Inc. before it changed its name to Holdings, Inc. in 2003 and then it Iteris Inc in 2004. The company has a market cap of $102.32M and en enterprising value of $115.30M. The company's main business is providing outdoor machine vision systems and sensors in North America. They produce roadway sensors, automotive sensors, and transportation systems with a variety of services offered under each category [14].

[102]
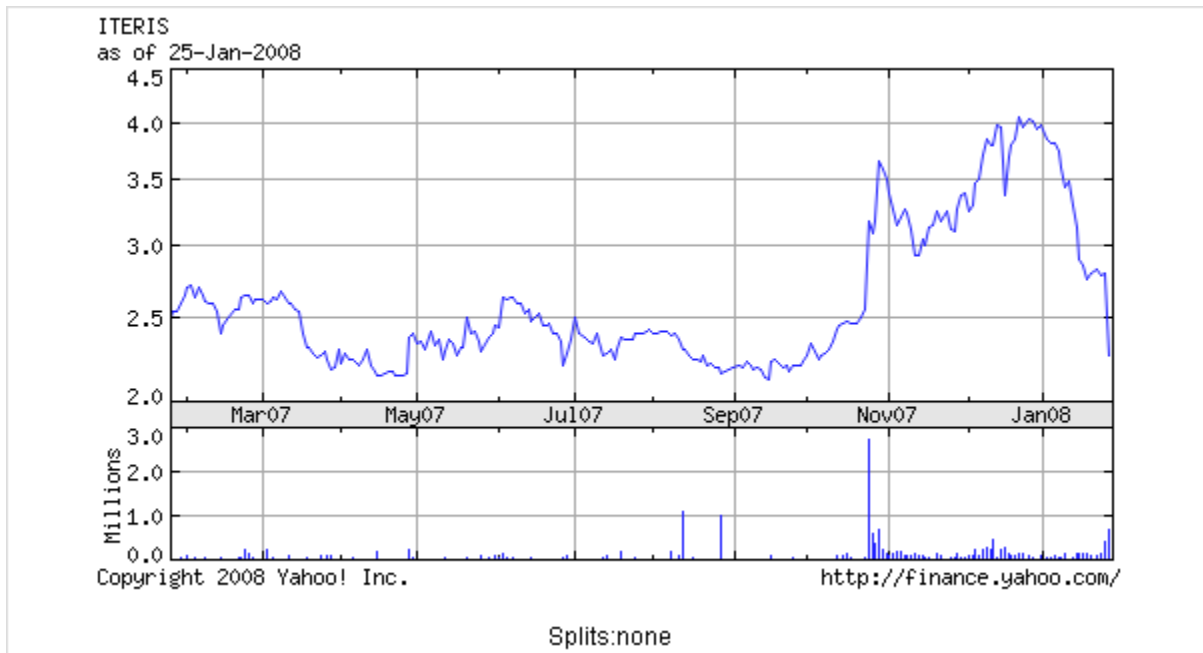
Figure 85: ITI 1 Year Value

NovaMed Inc (NOVA) was bought on 11/7 after BRP was sold. The company has a market cap of $109.72M and an enterprise value of $209.59M. This company engages in health services activities such as the acquisition, development, and operation of ambulatory surgery centers (ASCs) in the United States. The company was formerly known as NovaMed Holdings, Inc. when it was founded in 1995, changed its name to NovaMed Eyecare, Inc in 1999 and then to NovaMed Inc, in 2004. The surgery centers provide a wide range of procedures from cosmetic to gastroenterology to pain management. The company also owns an optical laboratory that surfaces, finishes, and distributes corrective lenses and eyeglasses [14].

[103]

Figure 86: NOVA 1 Year Value

3.3.2   Investment Overview

The GARP simulation was run from October 1st, 2007 to December 7th, 2007. In this simulation $20,000 was used to buy 5 initial stocks. $4,000 was allotted for each stock and as many shares were bought with that money as possible, while also considering the $10 trade fee. A record of all the transactions was kept in a Microsoft Excel file which included information such as price, shares, symbol, net costs/proceeds, profit/loss, total cash, and total profit. This information was used to gauge the status of the shares and the overall simulation.

The daily activities of the simulation included tracking the stock prices, researching future stocks, reviewing graphs, and keeping records up to date. Researching future stocks was the most important daily activity because if a stock that was owned did not perform well, there

[104]

were many stocks to choose from which were already known and could be used in a pinch. Reviewing graphs was also fairly important because it is much easier to spot trends by looking at a graph then looking at a Microsoft Excel file full of numbers. The stock prices were tracked for each of the stocks that were owned and the price were recorded in the Microsoft Excel file for quick and easy reference.

When a stock was determined to be not performing well enough to be kept it was sold and a new stock was bought with the money that was made from the trade. It was especially important to remember the $10 trade fee for the selling of the old stock and the buying of the new stock. The traded stock was also tracked after it was sold to determine if the decision to sell it was correct, which was helpful in spotting trends.

At the end of the simulation all of the stocks were sold back including a $10 trade fee for each transaction. By using the Excel file it was easy to see exactly how much money was made or lost in the simulation, which stocks made or lost the most money, and how much cash was available at any one time. That made the writing of the results section much easier to be done.

3.3.3   Technical Analysis

A technical analysis of the GARP trading strategy stocks was done by analyzing the stock's performance with the help of Bollinger Bands. Bollinger bands help a trader buy and sell stocks by signaling points at which they should buy or sell. Traders can buy when price rises above the upper Bollinger Band or sell when price falls below the lower Bollinger Band. The use of Bollinger Bands is not only limited to stock traders; most notably implied volatility traders, sell options when Bollinger Bands are historically far apart or buy options when the Bollinger Bands are historically close together, in both instances, expecting volatility to revert

back towards the average historical volatility level for the stock [14]. For all the stocks, points will be shown where we should have made a trade, whether it was to buy or sell. The figures below show the price of the stock along with the Bollinger Band over the course of the simulation. The date it was bought and date sold will also be marked on the figure. These strategies were not used during the course of the simulation, but now can be used to judge the performance of buys and sells.   A green dot indicates when a stock should have been bought. A red dot indicates when a stock should have been sold. A blue dot indicates the actual date it was bought. An orange dot indicates when the stock was actually sold.
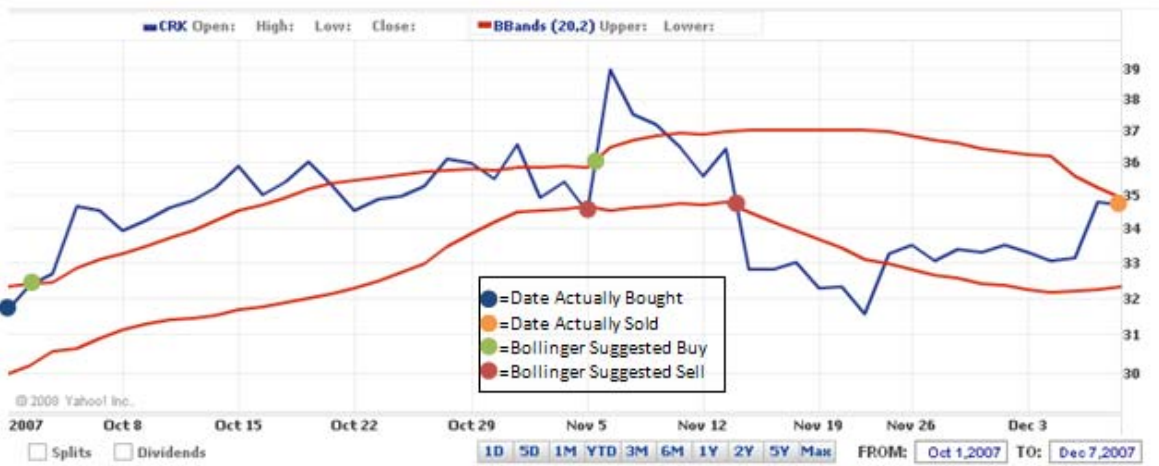
Figure 87: CRK Technical Analysis

This stock was bought relatively close to a suggested buy point but was kept through two sell points. At the time CRK was sold it looked as though it would reach another buy point in the near future.

Figure 88: FBTX Technical Analysis

This stock was bought when the price was between Bollinger bands and was sold in between two suggested sell points. FBTX went through 3 sell points after it was actually sold.
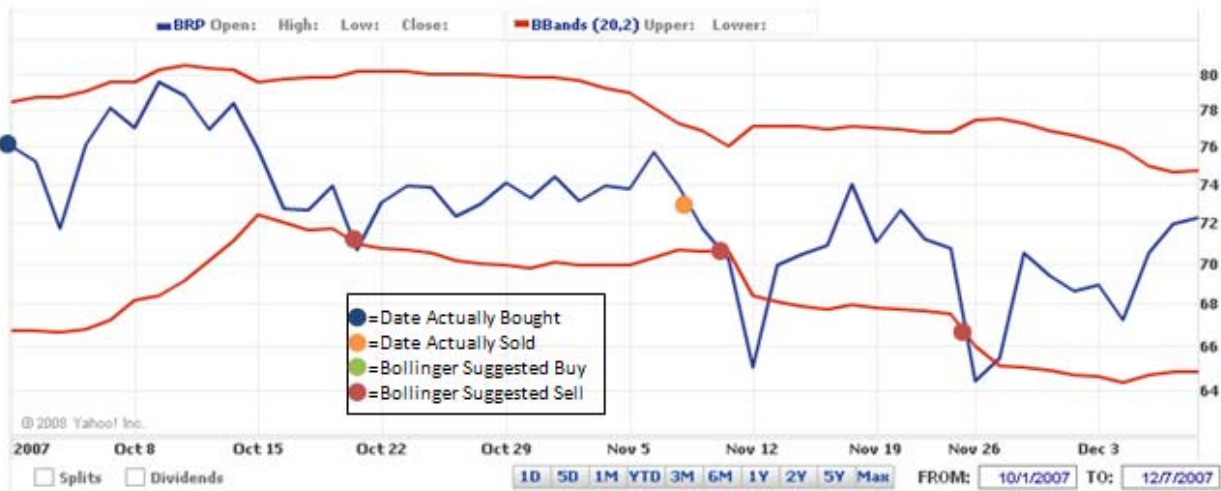
Figure 89: BRP Technical Analysis

BRP never had any suggested buy points and had one suggested sell point in the middle of its simulation. It was sold just before a suggested sell point after a turbulent simulation.

[107]

Figure 90: AAON Technical Analysis

This stock was bought when there was neither a suggested buy or suggested sell in close proximity. AAON was sold after a suggested sell but far too late. There was a suggested buy close to the end of the overall simulation.
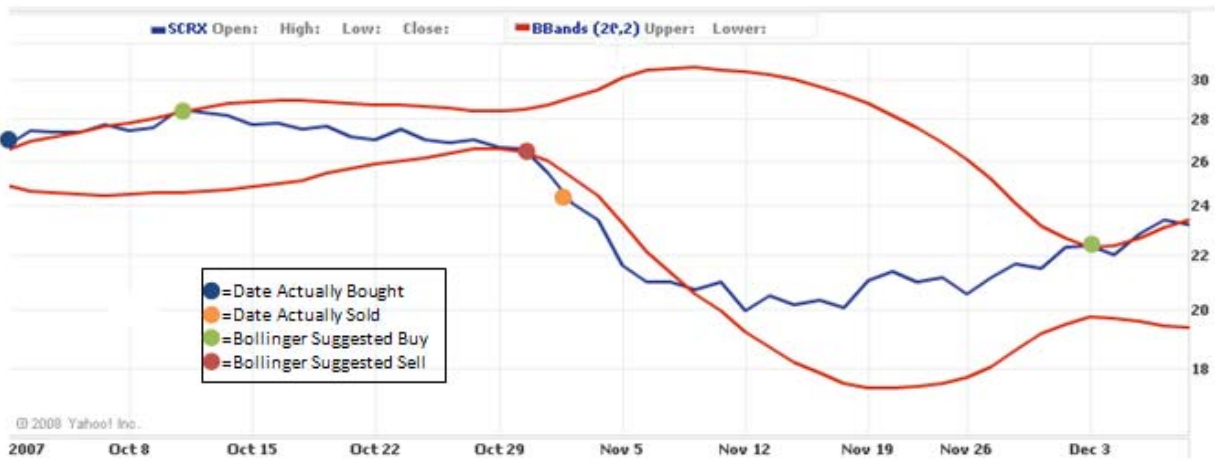
Figure 91: SCRX Technical Analysis

[108]

This stock was bought just after a suggest buy and experienced another suggested buy shortly after that. SCRX was sold just after a suggested sell but could have been bought later in the overall simulation which is indicated by the suggested buy

Figure 92: RTP Technical Analysis

This stock was bought while the price was between the Bollinger Bands. RTP experienced a suggested buy about halfway through its simulation and was sold close to another.

Figure 93: TWGP Technical Analysis

TWGP was bought before a suggested buy, while it was between the Bollinger Bands. It was sold while the price was between the Bollinger Bands.

Figure 94: ITI Technical Analysis

This stock was bought after a suggested buy, but after it fell back between the Bollinger Bands. ITI had a suggested buy just before it was sold at the end of the simulation.

[110]

Figure 95: NOVA Technical Analysis

This stock had a suggested buy at the beginning of the overall simulation, but was bought just after a suggested sell. NOVA recovered and spent the majority of its simulation between the Bollinger Bands.

3.3.4 Results

Comstock Resources Inc. was bought on the first day of the simulation, October 1st, 2007. This stock was kept for the duration of the simulation. This stock had an overall profit of $475.36, which was one of the more profitable stocks chosen. The table below shows the tracking of this stock. Overall this stock performed well. This stock could have been more profitable if it had been traded about halfway through the simulation, which can be seen in the figure below. The graph represents the time period over which the simulation was run for this stock.

[111]

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/1/2007	CRK	Buy	$30.84	129	$3,988.36	
12/7/2007	CRK	Sell	$34.68	129	$4,463.72	$475.36

Table 4: CRK Transactions

Figure 96: CRK Prices Throughout Simulation

Franklin Bank Corp. was bought on the first day of the simulation, October 1st, 2007. This stock was kept until October 18th, 2007 and was sold. This stock had an overall loss of $517.95, which was one of the biggest losses. The table below shows the tracking of this stock. Overall this stock did not perform well at all. This stock was a poor selection when it was initially selected. This stock lost money from the time it was bought to the time it was sold, which can be seen in the first figure below. The graph represents the time period over which the simulation was run for this stock. The stock performance if it had not been sold but kept throughout the simulation can be seen in the second figure below. As one can see it was a wise decision to sell, as this stock nearly dropped in price by half.

[112]

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/1/2007	FBTX	Buy	$9.20	433	$3,993.60	
10/18/2007	FBTX	Sell	$8.05	433	$3,475.65	($517.95)

Table 5: FBTX Transactions

Figure 97: FBTX Prices from Date Bought to Date Sold

Figure 98: FBTX Prices throughout Entire Simulation

Brasil Telecom Participacoes S/A was bought on the first day of the simulation, October 1st, 2007. This stock was kept until November 7th, 2007 and was sold. This stock had an overall profit of $38.83. The table below shows the tracking of this stock. Overall this stock performed below average but was sold at the correct time to negate losses. This stock performed well for a short time but then took a nose dive which can be seen in the first figure below. The graph represents the time period over which the simulation was run for this stock. The stock performance if it had not been sold but kept throughout the simulation can be seen in the second figure below.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/1/2007	BRP	Buy	$74.62	53	$3,964.86	
11/7/2007	BRP	Sell	$75.73	53	$4,003.69	$38.83

Table 6: BRP Transactions

Figure 99: BRP Prices from Date Bought to Date Sold

Figure 100: BRP Prices throughout Entire Simulation

AAON Inc. was bought on the first day of the simulation, October 1ˢᵗ, 2007. This stock was kept until October 26ᵗʰ, 2007 and was sold. This stock had an overall loss of profit of -$411.88, which was a rather larger profit loss. The table below shows the tracking of this stock. Overall this stock did not perform well. This stock gained price for a period of time before it took a rapid downfall, which can be seen in the first figure below. The graph represents the time period over which the simulation was run for this stock. The stock performance if it had not been sold but kept throughout the simulation can be seen in the second figure below. If this stock had been kept for the length of the simulation losses would have been very minimal compared to the losses that were suffered when it was sold.

[116]

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/1/2007	AAON	Buy	$19.73	202	$3,995.46	
10/26/2007	AAON	Sell	$17.79	202	$3,583.58	($411.88)

Table 7: AAON Transactions

Figure 101: AAON Prices from Date Bought to Date Sold

[117]

Figure 102: AAON Prices throughout Entire Simulation

Sciele Pharma Inc. was bought on the first day of the simulation, October 1st, 2007. This stock was kept until November 2nd, 2007 and was sold. This stock had an overall loss of profit of -$426.92, which was a larger profit loss. The table below shows the tracking of this stock. Overall this stock did not perform well. This stock gained price for a period of time then stayed at a level price before it took a slow downfall, which can be seen in the first figure below. The graph represents the time period over which the simulation was run for this stock. The stock performance if it had not been sold but kept throughout the simulation can be seen in the second figure below. If this stock had been kept for the length of the simulation losses would have been about the same as for when it was actually sold.

[118]

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/1/2007	SCRX	Buy	$26.02	153	$3,991.06	
11/2/2007	SCRX	Sell	$23.38	153	$3,567.14	($423.92)

Table 8: SCRX Transactions

Figure 103: SCRX Prices from Date Bought to Date Sold
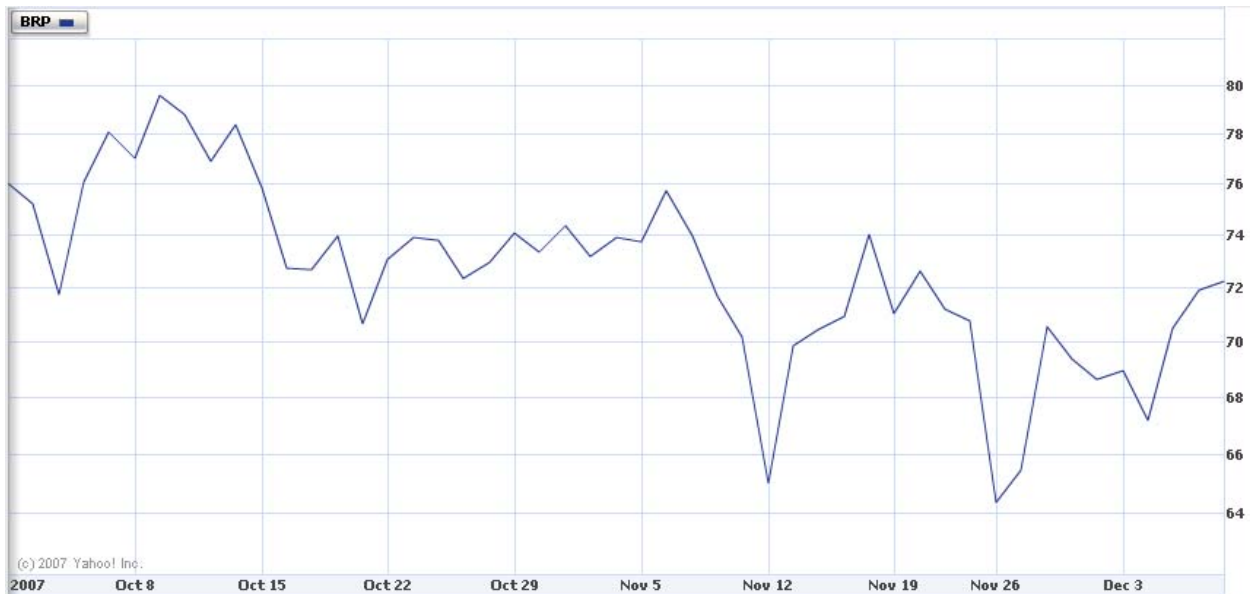
Figure 104: SCRX Prices throughout Entire Simulation

Rio Tinto plc (RPT) was bought on October 18th, 2007 after FBTX was sold. This stock was kept until December 7th, 2007 and was sold. This stock had an overall profit of $1115.50, which was a very large profit. The table below shows the tracking of this stock. Overall this stock performed very well. This stock stayed at a level price for a period of time then rose very dramatically after which it declined but then rose again, which can be seen in the first figure below. The graph represents the time period over which the simulation was run for this stock. The stock performance if it had been initially bought on the first day of the simulation and kept throughout the simulation can be seen in the second figure below. If this stock had been bought at the beginning it would have been bought for about the same price so the profit would be about the same.

[120]

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/18/2007	RTP	Buy	$354.45	10	$3,554.50	
12/7/2007	RTP	Sell	$468.00	10	$4,670.00	$1,115.50

Table 9: RTP Transactions

Figure 105: RTP Prices from Date Bought to Date Sold
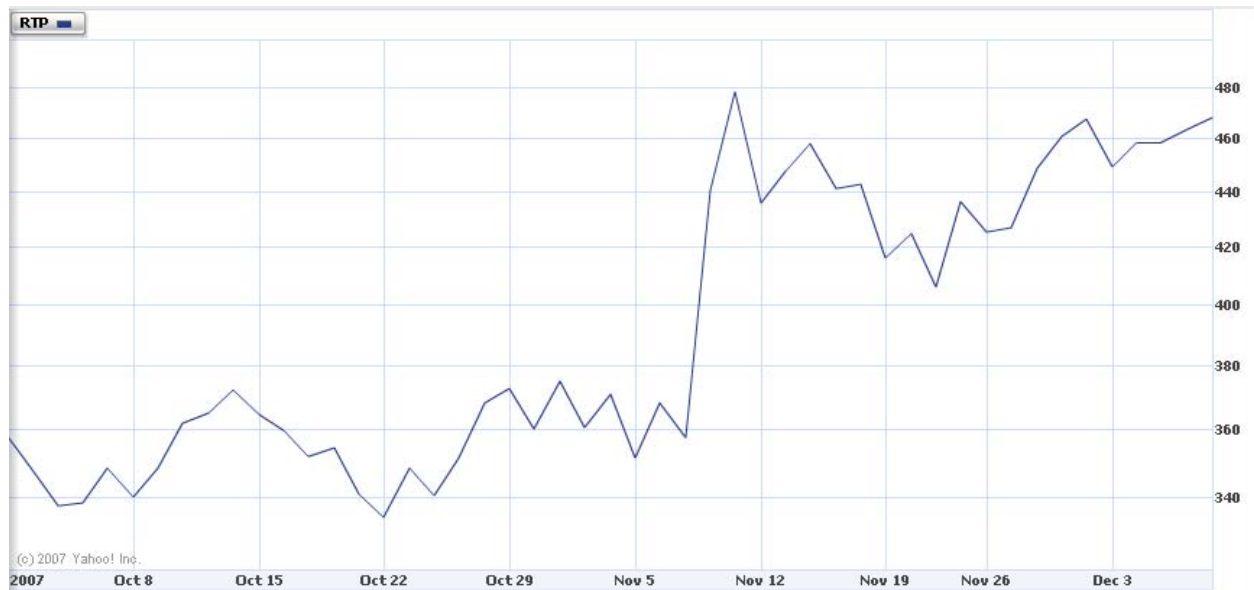
Figure 106: RTP Prices throughout Entire Simulation

Tower Group Inc (TWGP) was purchased on October 26th, 2007 after AAON was sold. This stock was kept until December 7th, 2007 and was sold. This stock had an overall profit of $326.69, which was a good profit. The table below shows the tracking of this stock. Overall this stock performed well. This stock rose slightly after its purchase but then declined for a period before rebounding above its purchase price, which can be seen in the first figure below. The graph represents the time period over which the simulation was run for this stock. The stock performance if it had been initially bought on the first day of the simulation and kept throughout the simulation can be seen in the second figure below. If this stock had been bought at the begging it would have been bought for a price less then it was bought for so a larger profit would have been made, however a large drop in price would most likely have triggered a sale of the stock.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/26/2007	TWGP	Buy	$29.39	121	$3,566.19	
12/7/2007	TWGP	Sell	$32.28	121	$3,895.88	$329.69

Table 10: TWGP Transactions

Figure 107: TWGP Prices from Date Bought to Date Sold

Figure 108: TWGP Prices throughout Entire Simulation

Iteris Inc (ITI) was acquired on November 2nd, 2007 after SCRX was sold.   This stock was kept until December 7th, 2007 and was sold. This stock had an overall profit of $473.20, which was an above average profit. The table below shows the tracking of this stock. Overall this stock performed well. This stock declined in price after its purchase but quickly rebound to rise the rest of the simulation, which can be seen in the first figure below. The graph represents the time period over which the simulation was run for this stock. The stock performance if it had been initially bought on the first day of the simulation and kept throughout the simulation can be seen in the second figure below. If this stock had been bought at the begging it would have been bought for a price less then it was bought for, this would have made a larger profit because the stock experienced a sharp rise in price just before it was purchased.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
11/2/2007	ITI	Buy	$3.26	1096	$3,582.96	
12/7/2007	ITI	Sell	$3.71	1096	$4,056.16	$473.20

Table 11: ITI Transactions

Figure 109: ITI Prices from Date Bought to Date Sold

[125]
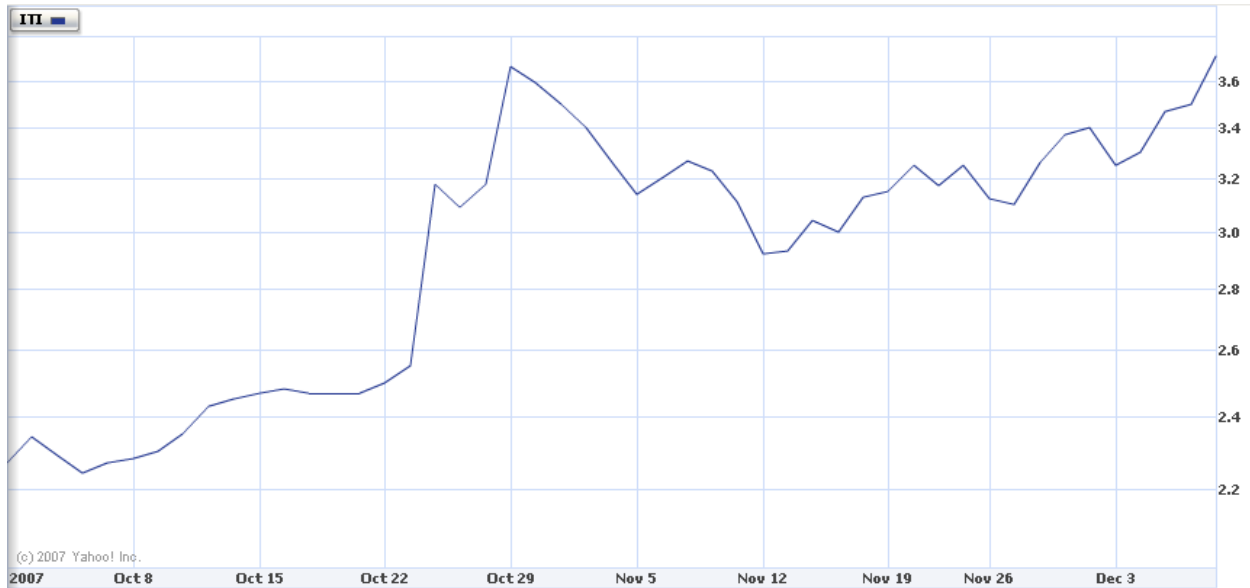
Figure 110: ITI Prices throughout Entire Simulation

NovaMed Inc (NOVA) was bought on November 7th, 2007 after BRP was sold.   This stock was kept until December 7th, 2007 and was sold. This stock had an overall loss of profit of -$11.24, which was a slight loss in profit. The table below shows the tracking of this stock. Overall this stock performed did not quite break even. This stock was sold for more than it was purchased but due to the commission fee it did not break even. This stock dropped in price slightly after it was purchase then rose and stayed fairly constant for the rest of the simulation, which can be seen in the first figure below. The graph represents the time period over which the simulation was run for this stock. The stock performance if it had been initially bought on the first day of the simulation and kept throughout the simulation can be seen in the second figure below. If this stock had been bought at the begging it would have been bought for a price less then it was bought for, this would have made a larger profit because the stock rose very

[126]

dramatically followed by a sharp decline.   The stock would most likely been sold during this

decline for a price higher then it was sold on December 7th, 2007.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
11/7/2007	NOVA	Buy	$4.56	876	$4,004.56	
12/7/2007	NOVA	Sell	$4.57	876	$3,993.32	($11.24)

Table 12: NOVA Transactions

Figure 111: NOVA Prices from Date Bought to Date Sold

[127]

Figure 112: NOVA Prices throughout Entire Simulation

The stocks as a whole performed well. The total profit can be seen in the table below. The profit can be seen after each stock is sold. The stocks made a profit of $1,067.59, which was a rise of 2.67% from the initial amount invested. This averages to be about $106.76 a week over the 10 week simulation. After the initial 3 stocks were sold, there was a loss of over $1,300 but the final stock selections gain all this back plus much more.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total Profit
10/1/2007							$40,000.00	
10/1/2007	FBTX	Buy	$9.20	433	$3,993.60		$36,006.40	
10/1/2007	BRP	Buy	$74.62	53	$3,964.86		$32,041.54	
10/1/2007	CRK	Buy	$30.84	129	$3,988.36		$28,053.18	
10/1/2007	AAON	Buy	$19.73	202	$3,995.46		$24,057.72	
10/1/2007	SCRX	Buy	$26.02	153	$3,991.06		$20,066.66	
10/18/2007	FBTX	Sell	$8.05	433	$3,475.65	($517.95)	$23,542.31	-$517.95
10/18/2007	RTP	Buy	$354.45	10	$3,554.50		$19,987.81	
10/26/2007	AAON	Sell	$17.79	202	$3,583.58	($411.88)	$23,571.39	-$929.83
10/26/2007	TWGP	Buy	$29.39	121	$3,566.19		$20,005.20	
11/2/2007	SCRX	Sell	$23.38	153	$3,567.14	($423.92)	$23,572.34	-$1,353.75
11/2/2007	ITI	Buy	$3.26	1096	$3,582.96		$19,989.38	
11/7/2007	BRP	Sell	$75.73	53	$4,003.69	$38.83	$23,993.07	-$1,314.92
11/7/2007	NOVA	Buy	$4.56	876	$4,004.56		$19,988.51	
12/7/2007	CRK	Sell	$34.68	129	$4,463.72	$475.36	$24,452.23	-$839.56
12/7/2007	RTP	Sell	$468.00	10	$4,670.00	$1,115.50	$29,122.23	$275.94
12/7/2007	TWGP	Sell	$32.28	121	$3,895.88	$329.69	$33,018.11	$605.63
12/7/2007	ITI	Sell	$3.71	1096	$4,056.16	$473.20	$37,074.27	$1,078.83
12/7/2007	NOVA	Sell	$4.57	876	$3,993.32	($11.24)	$41,067.59	$1,067.59

Table 13: GARP Stock Transactions and Total Profit

3.4   Mutual Funds

This section will cover the selection, investment overview, technical analysis, and results for mutual fund investing. The selection of the mutual funds is based on a set of criteria outlined in Chapter 3.4.1, which is used to filter mutual funds. The investment overview will describe the process as a whole. A technical analysis will be performed using Bollinger Bands as a guide and the results will quantify the investment strategy.

3.4.1   Selection

Mutual funds were selected through the help of an online mutual fund screener. We first screened the results for mutual funds that had a Morningstar rating of at least 4.   The Morningstar rating has a max of 5, that being the best, and a minimum of 1 being the worst. This gave us a wide range of results with not much to discern very good funds from okay funds. We

then screened these results for funds that had a high return. This narrowed field of potential

funds down but we were still not satisfied. The next screening was for low risk funds which

narrowed it enough that we could pick a fund knowing it would be good. We selected a mutual

fund that was the highest rated over the past year to see how it would do. In comparison we ran

the same filters for a 4-star, average return, and average risk mutual fund to compare how the

two do [14]. The following are the two Mutual funds selected:

		Shares	Price Per Share
ATIBX	AIM Trimark Small Companies FD	623	16.02
ACDVX	AIM Capital Development Fund CL	455	21.95
Value			19967.71

Table 14: Mutual Funds Selection

The first fund that was selected was the AIM TRIMARK SMALL COMPANIES FD

(ATIBX). This fund had a high return and low risk with a Morningstar rating of 5. This

investment seeks long term growth and is managed by Robert Mikalachki, who has been the lead

manager since 2003. It has net assets of 29.36 million and a year-to-date return of 10.88% [14].

Figure 113: ATIBX 1 Year Value

The second fund we chose AIM Capital Development I (ACDVX). This fund had an average return, average risk, and a Morningstar rating of 4. This fund also seeks long term growth of capital and is managed by Paul J. Rasplick. He has been the lead fund manager on the account since 1998. This fund has a year-to-date return of 9.86 % and net assets of 98.7 million [14].

Figure 114: ACDVX 1 Year Value

3.4.2   Investment Overview

The mutual fund simulation was run from October 1st, 2007 to December 7th, 2007. $20,000 was invested into 2 funds at about $10,000 apiece with an additional $10 for the trade fee. In this simulation most of the work was done before the simulation started with the selection of the funds. The mutual fund prices were tracked daily and recorded in a Microsoft Excel file along with things such as price, shares, symbol, net costs/proceeds, profit/loss, total cash, and total profit.   This information was used to gauge the status of the shares and the overall simulation. The mutual funds were chosen for the length of the simulation because they are meant to be held for long periods of time, as they can see periods of loss during periods of overall gain. With this in mind there was no need to research additional funds during the course of the simulation.

[132]

3.4.3   Technical Analysis

A technical analysis of the mutual funds was done by analyzing the mutual fund's performance with the help of Bollinger Bands. For all the mutual funds, points will be shown were we should have made a trade, whether it was to buy or sell. The figures below show the price of the mutual fund along with the Bollinger Band over the course of the simulation. The date it was bought and date sold will also be marked on the figure. These strategies were not used during the course of the simulation, but now can be used to judge the performance of buys and sells.   A green dot indicates when a mutual fund should have been bought. A red dot indicates when a mutual fund should have been sold. A blue dot indicates the actual date it was bought. An orange dot indicates when the mutual fund was actually sold.
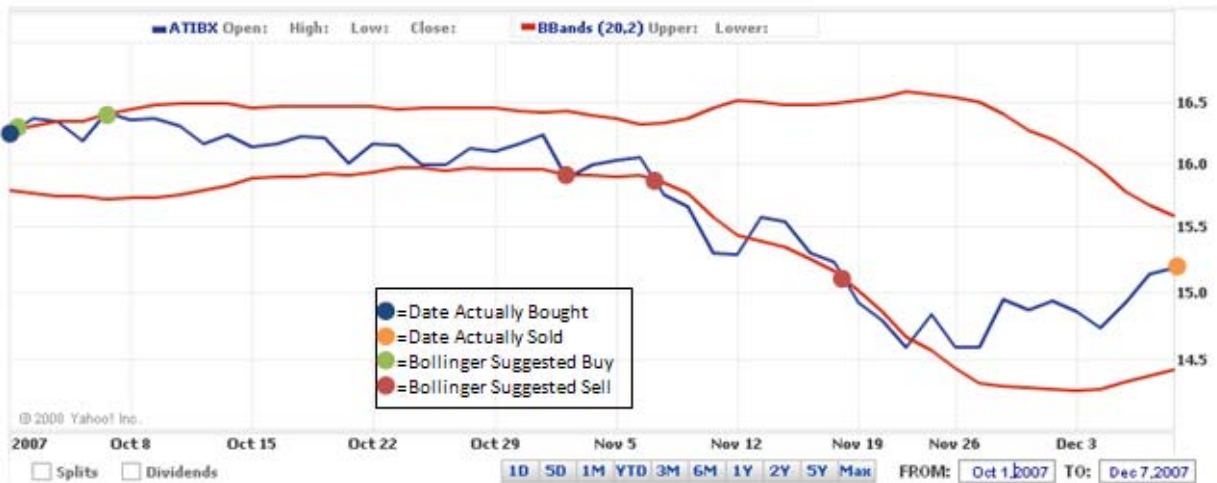
Figure 115: ATIBX Technical Analysis

ATIBX was bought just before a suggested buy but about halfway through the simulation it experienced three suggested buys. It finished the simulation between the Bollinger Bands.

[133]
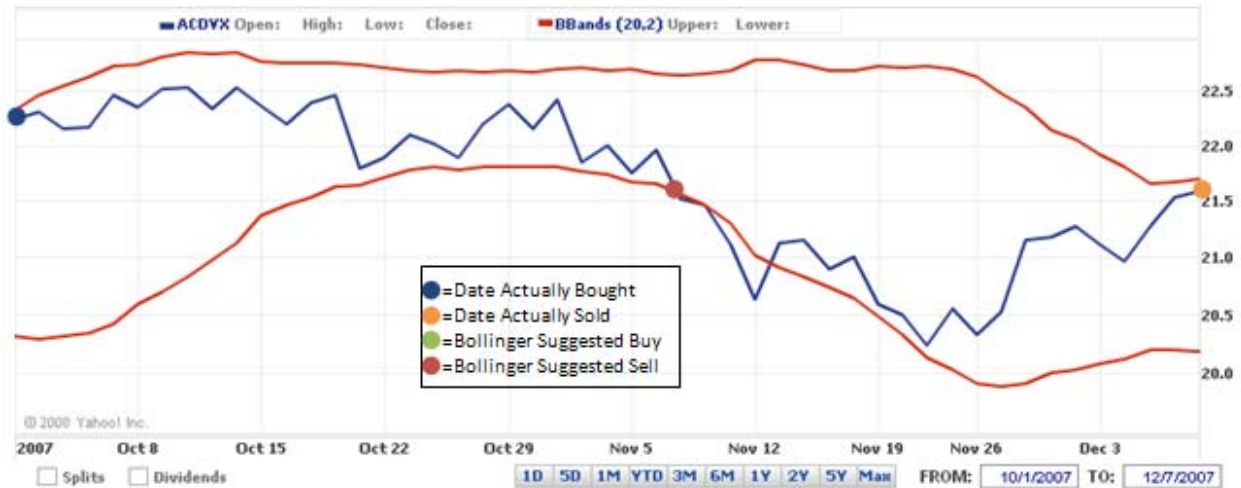
Figure 116: ACDVX Technical Analysis

This mutual fund was bought just after a suggested buy and only experienced one suggested sell before the simulation was completed. ACDVX was sold as it appeared to be heading towards another suggested buy.

3.4.4 Results

AIM TRIMARK SMALL COMPANIES FD was bought on the first day of the simulation, October 1st, 2007. This mutual fund was kept for the duration of the simulation. This mutual fund had an overall loss of $543.32, which did not meet expectations. The table below shows the tracking of this mutual fund. Overall this mutual fund did not perform well. The mutual funds were kept for the duration of the simulation because they are not meant to be traded frequently and go through periods of turbulent prices. The figure below represents the time period over which the simulation was run for this mutual fund. The mutual fund declined in price almost the entire duration of the simulation.

[134]

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/1/2007	ATIBX	Buy	$16.02	623	$9,990.46	
12/7/2007	ATIBX	Sell	$15.18	623	$9,447.14	($543.32)

Table 15: ATIBX Transactions

Figure 117: ATIBX Prices throughout Entire Simulation

AIM Capital Development I was bought on the first day of the simulation, October 1st, 2007. This mutual fund was kept for the duration of the simulation. This mutual fund had an overall loss of $188.35, which was better than the other mutual fund but still did not turn a profit. The table below shows the tracking of this mutual fund. Overall this mutual fund did not perform well. The mutual funds were kept for the duration of the simulation because they are not meant to be traded frequently and go through periods of turbulent prices. The figure below

represents the time period over which the simulation was run for this mutual fund. The mutual fund rose slightly after it was purchased but then went into a slow decline but rose again before it was sold.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss
10/1/2007	ACDVX	Buy	$21.95	455	$9,997.25	
12/7/2007	ACDVX	Sell	$21.58	455	$9,808.90	($188.35)

Table 16: ACDVX Transactions

Figure 118: ACDVX Prices throughout Entire Simulation

The mutual funds were both kept for the duration of the simulation. Both started out fairly well but took steep declines which led both of them to earn a loss in profit. The total loss

[136]

from the simulation was $731.67, which was 3.66% of the initial amount invested.   This

information can be seen in the table below.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total Profit
10/1/2007	ATIBX	Buy	$16.02	623	$9,990.46		$10,009.54	
10/1/2007	ACDVX	Buy	$21.95	455	$9,997.25		$12.29	
12/7/2007	ATIBX	Sell	$15.18	623	$9,447.14	($543.32)	$9,459.43	-$543.32
12/7/2007	ACDVX	Sell	$21.58	455	$9,808.90	($188.35)	$19,268.33	-$731.67

Table 17: Mutual Fund Transactions and Total Profit

3.5   Bonds

This section of the report will cover how the bonds were selected, the performance of the

bonds and the technical analysis of the bond investments.

3.5.1   Selection

For the bonds, we selected Treasury Bonds that mature at the end of December this year.

Each bond costs $100.25 therefore, we bought 199 bonds. Bonds tend to be a low risk long term

investment but low risk also means low reward. The bonds will hopefully rise in value over the

next few months.

3.5.2   Investment Overview

The Stock Market simulation was run during the time-span from October 1st, 2007 to

December 7th, 2007.   In this simulation a government bond was chosen and $20,000 was

invested.   In this simulation the bonds were left alone from the start to the finish of the

simulation. The price of the bonds was tracked weekly and this ten week period is considered a very short duration for bonds to mature. There was no need to sell or buy new bonds on a weekly basis because this was meant to be a long term investment.

3.5.3   Technical Analysis

In the selection of bonds only two things were taken into consideration; the mature date of the bond, we wanted one that ended around the same time of the simulation, and that the bond was government issued. With this in mind we chose a government bond that matured in mid December. This bond did not make or lose any money. The ten week period is a very short time-span for a bond to mature.

3.5.4   Results

The bonds did not have enough time to mature to yield a profit. The bonds did not gain or lose money; they were bought for $100.25 and sold for $100.25. The ten week period only showed that more time is needed when investing in a bond. This method of investment is for those investors who can wait awhile for bonds to mature. Bonds are very safe investments but also very low reward.

Date	Action	Price	Shares	Profit/Loss	Total Cash
10/1/2007	Buy	$100.25	199	--	$40.25
12/7/2007	Sell	$100.25	199	0	$19,980.00

Table 18: Results of Bonds

[138]

3.6   *Long Term Investing*

This section covers the ten-week simulation for our long term investment portfolio. It features everything from selection and purchase to sale and results.

3.6.1   Selection

The long term investment selection is a one-time pick. We picked five stocks for a $20,000 portfolio and we will sit on those stocks until the end of the simulation. The stocks we selected are shown in Table 19 below.

		Shares	Price Per Share
UA	Under Armour Inc.	66	60.16
GOOG	Google	7	571.32
AAPL	Apple Inc.	25	154.24
BUD	Anheuser-Busch Companies Inc.	80	49.805
RL	Ralph Lauren Polo CP	51	77.73
Value			19774.40

Table 19: Long Term Stock Selection

The performance of all of these stocks over the past year is shown in the following charts.

The first is Under Armour. It is shown in Figure 119.
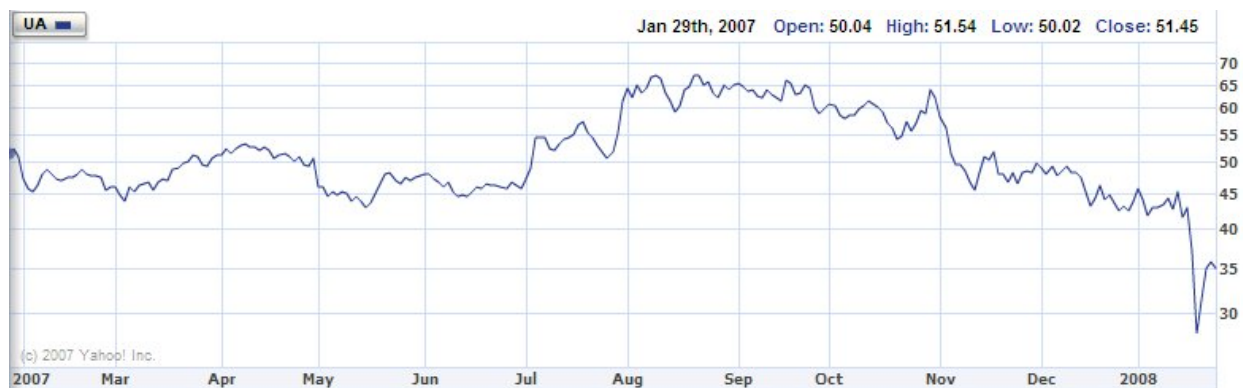
Figure 119: UA 1 Year

[139]

The next stock in the portfolio is Google. Its past year's chart is shown below in Figure 120.

Figure 120: GOOG 1 Year

The past performance for Apple is shown below in Figure 121.

Figure 121: AAPL 1 Year

In Figure 122, the chart for the performance of Anheuser-Busch over the past year is shown.

[140]

Figure 122: BUD 1 Year

Finally, the past performance of the last stock in the portfolio, Ralph Lauren, is shown. It's below in Figure 123.

Figure 123: RL 1 Year

3.6.2   Investment Overview

This portfolio was selected at the very beginning of the ten week simulation. It was decided that the standard $20,000 we used in all other simulations would be used here as well and we stuck with the strategy of diversifying throughout five stocks. Two high-profile stocks in Apple and Google were selected. They seemed to be very strong stocks that have shown that they were growing and worth the high price tag. The portfolio earned very strongly in the first

half of the simulation, but ended up dropping due to the lower-profile stocks losing their value. In the end though, the market did well at the end of our simulation and helped the low-profile stocks climb back up as the high-profile ones continued to grow. The portfolio did end up turning a profit after the ten weeks.

3.6.3   Technical Analysis

Bollinger Bands will be used once again for the technical analysis of a portfolio. They are being used here to show the performance and transaction recommendations throughout the simulation that we could have used. However, because this is the long-term investment portfolio, no transactions were allowed to be made. This section is strictly for analytical purposes.

Under Armour was purchased in the middle of the bands and ended up crossing the bands several times over the ten-week span. Overall, if we sold early as was recommended, we could have saved some money, but the stock had ups and downs. In the end, it flat-lined a bit and was sold for a loss. This chart is shown in Figure 124.

Figure 124: UA Bollinger Bands

Google managed to stay right around the upper band for many weeks to start after being bought right at the upper band. It then plummeted towards the lower band, but never crossed it. It was held onto for a while longer, while it gained its value back. It was sold at a great time, right around its peak for the entire simulation. This chart is shown below in Figure 125.

Figure 125: GOOG Bollinger Bands

Apple acted much the same as Google. It hovered around that top band for many weeks, but then it dipped fast. It even crossed the lower band. If we had sold there, we would have lost a bit of money. However, it was also held onto and it gained its value back so it could end up profiting us over $1000. The chart is shown in Figure 126.

Figure 126: AAPL Bollinger Bands

BUD was all over the charts. It began fairly low and quickly jumped above the upper band and hovered there for a bit. Then it started a steady downward pace towards the lower band. It passed over it multiple times, but we could not sell. Luckily, it made a very strong comeback and jumped back up around the top band, where it stayed to end up turning a profit for us. The chart is shown in Figure 127.

Figure 127: BUD Bollinger Bands

Ralph Lauren was not a favorable stock. It began right between the bands but quickly made a drop for the lower band. If we had been able to sell on the first crossing, we would have salvaged some money. However, it just stayed down almost the entire way. It had one short burst towards the upper band about two-thirds of the way through, but settled back down and ended up losing us money. The chart is shown below in Figure 128.

Figure 128: RL Bollinger Bands

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3.6.4   Results

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
10/1/2007							$20000.00	
10/1/2007	UA	Buy	$60.16	66	$3970.56		$16029.44	
10/1/2007	GOOG	Buy	$571.32	7	$3999.24		$12030.20	
10/1/2007	AAPL	Buy	$154.24	25	$3856.00		$8174.20	
10/1/2007	BUD	Buy	$49.805	80	$3984.40		$4189.80	
10/1/2007	RL	Buy	$77.73	51	$3964.23		$225.57	
12/7/2007	UA	Sell	$48.44	66	$3197.04	($773.52)	$3422.61	($773.52)
12/7/2007	GOOG	Sell	$714.87	7	$5004.09	$1004.85	$8426.70	$231.33
12/7/2007	AAPL	Sell	$194.30	25	$4857.50	$1001.50	$13284.20	$1232.83
12/7/2007	BUD	Sell	$52.79	80	$4223.20	$238.80	$17507.40	$1471.63
12/7/2007	RL	Sell	$68.97	51	$3517.47	($446.76)	$21024.87	$1024.87

Table 20: Long Term Investment Transaction Summary

This portfolio performed very well. The overall profit of $1024.87 in a ten week simulation is pretty strong. Its success can be mainly credited to Google and Apple, which both had about the same profit of over $1000, which is about 25%. That is a very large gain percentage for such a short period of time. The charts for all of these stocks while they were owned are shown below.

The first is the chart for Under Armour in Figure 129. This stock performed the worst out of the five by far.

Figure 129: UA Performance Chart

This second chart is of the strongest stock we owned, Google. It posted a very strong gain. It is shown below in Figure 130.

Figure 130: Google Performance Chart

This next stock also performed very well, falling just shy of the earnings of Google. The chart for Apple is shown below in Figure 131.

Figure 131: Apple Performance Chart

Anheuser-Busch performed fairly well. It did end up gaining money, but did not have a tremendous profit. The chart is shown below in Figure 132.

Figure 132: BUD Performance Chart

The final stock in this portfolio was another one that failed. It lost about $450 of its original investment. The chart of Ralph Lauren's performance is shown below in Figure 133.

Figure 133: RL Performance Chart

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4. Conclusion

We conducted our IQP around a ten week stock market simulation that ran over A and B terms. The simulation was based on six types of portfolios: a value portfolio, a growth portfolio, a GARP portfolio, a mutual fund portfolio, a bond portfolio, and a long term investment portfolio. The results of this simulation resulted in a formal research report that analyzed different investment strategies and portfolio performances. Our background included a history of the stock market and investing, an overview of different types of investment, and the risks associated with investing. Each member of the group managed two portfolios. The value, growth and GARP portfolios where split between the three group members, each member taking responsibility for a single portfolio. To supplement these portfolios, each group member managed one of the following portfolios; mutual fund, bond, and long term. This resulted in each member being responsible for one of the main portfolios along with a minor portfolio.

With the closure of the ten week simulation it was very easy to see which portfolios did not perform the best in this short term simulation. The bond and mutual fund portfolios both lost money. The bonds did not reach maturity therefore they could not realize a profit. The mutual funds lost money which indicates that they were not held long enough because over a long period of time they should gain money. Both are low risk investments and therefore low yield, which needs a longer period of investment to take in profit. At the opposite end of the spectrum, it was very easy to see which portfolio performed the best. The value portfolio performed much better than expected since value trades are expected to last a long time. The GARP, growth, and long term portfolios all performed about the same, with a marginal profit. Our GARP, growth, and value portfolios did not perform as expected relative to each other. This made it very hard to

compare the results between the three portfolios, when the goals were very different. The three portfolios now became demonstrations on the techniques used to analyze and trade using the given technique.

It was determined by comparing the total profits and trading records of the portfolios that the value investment strategy performed the best. The large amount of money that was profited from this strategy could not be overlooked, even though it was not what was expected. This strategy is a long term investment but if money can be made off of it in the short term then we suggest using it. The GARP and growth investment strategies were both also profitable and the strategies also worked to profit money. Much of the successfulness of a strategy is based on how the overall market is performing. There are times when a value strategy can be much more successful than a growth strategy and there are times when a growth strategy can be more successful than a value strategy. To compensate for this, the GARP strategy is used to compensate between the two. This is what showed in our results, with the GARP strategy profit being in between the profits of growth and value strategies. This indicates that the market was in a period where a value strategy would perform better.

The experience that each member of the team has gained from this project will greatly influence our investments in the future. We have gained a wide range of knowledge about trading techniques, research, and analysis of stocks, mutual funds, and bonds. This knowledge came from a large amount of time spent researching and analyzing the stocks that were chosen for this simulation. This report will hopefully help guide others to learn more about the stock market, trading strategies, and investment opportunities from which they can start successfully investing.

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