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# A Stock Market Investigation

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By

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## **Abstract**

Investing money in the stock market is essential for companies to gain capital for operations and services. Stocks are bought and sold all the time and prices fluctuate constantly, opening the possibility of loss to an investor as well as profit. This project watched 27 companies and seeks to compare how large companies's stocks fare against small companies's stocks and how growth stocks fare against value stocks. A stock market simulator was used for trades over about 6 weeks. Internet resources were used to aid in investment decisions and to identify market trends.

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## **Chapter 1 – Introduction**

Investment is an important part of the economy. There are several forms of investment which are explored in Chapter 3. Stocks allow businesses to gain capital for operations and services. The price of company stocks reflects how well the company is doing and how they are expected to do, however the prices can be influenced by the community's sentiment, the state of the economy, and current events. Investors often choose stocks as a way to invest because they generally provide higher returns than other forms of investment/savings options.

Small company stocks generally fluctuate more than those of large companies, leading to larger possible gains and larger possible losses. Similarly, value stocks tend to show greater volatility than growth stocks. Having a diversity of large and small companies and growth and value stocks can reduce large losses. In addition, the investor can choose to diversify in the sectors and industries, further reducing risks. However, there is always a risk that is associated with investing in the stock market.

### **1.1 Goals and Methods**

The project compares four portfolios and their companies (companies sorted between portfolios by their market cap size and whether their stocks are classified as growth or value) in general trends and relative profits, and how these different stocks compare to the general market. When investing in the stock market, an investor wants to buy low and sell high. Some stocks may show faster price gains on a good day or faster losses on a bad day. Individual variation may be a result of news reports relating to the company, its industry, or its sector. Also depending on the state of the economy, the market may swing from bearish to bullish (and vice versa) at any time.

The simulations will be done on Virtual Stock Exchange found at the following website: <http://vse.marketwatch.com/Game/GameOverview.aspx>. This simulator was chosen as it allows the user to manage multiple portfolios at once with relative ease. The simulations begin with \$100,000 and were charged with a commission fee of \$10 per transaction.

## **1.2 Investment Terms**

Terms and definitions were found at <http://www.investmentterms.net/>

*Asset*- represents objects of value which can be exchanged for cash. Can be physical or non-physical items (real-estate vs. company name)

*Bear Market* -market developments that reveal a continuous decline in prices. Investors expect losses and pessimism is present among investors. Can be caused by fearful investors who sell at the sight of a decrease in price. Prices also drop when there is a decrease in profits of corporations.

*Bond* -form of debt security in which the issuer owes a debt to bondholders. The maturity times on bonds vary from around 1 year to 10+. Bondholders are similar to creditors, whereas stock holders are similar to partial owners. Bonds can be issued by companies and the government.

*Bull Market* -market developments that reveal a continuous increase in prices or where they are expected to grow. Optimism is usually found in investors at this time, as they believe the market will have sustained growth. It can be an indication of when the economy has made a recovery and starts to perform better.

*Broker* -an agent who facilitates securities trading. They receive a commission from the investor to compensate for their services.

*Capital* -the money that allows companies to operate. It is raised by a company in order to meet the monetary demand for expansion and growth.

*Common stock* -refers to equity ownership in the form of securities that entitles voting rights. The voting gives investors a say in the election of the management body.

*Depreciation* -the reduction in value of an asset. It is due to the use of the asset, attrition, depletion, time passage, obsolescence, or other factors. Annual depreciation can be calculated if the initial cost of the asset is known. Inflation is the opposite effect.

*Equity* -the interest in assets, distributed among shareholders in a particular corporation. It is the total assets minus all liabilities.

*Fiscal Year* -refers to a time period which a company or organization uses for accounting purposes, usually 12 months.

*Growth Stock* -refers to a stock that has exhibited high growth in the recent past. Investors expect to see similar upward development that will result in higher returns (The return on equity is calculated by dividing the net income by the equity of the company). A company is considered

a growth stock if they have at least a 15% return on their equities. Dividends are not typically paid by growth stocks, because surplus earnings are reinvested. Most technology and high-tech companies are considered growth stocks.

*Interest* -refers to a fee that is charged by a lending institution for a borrowed sum of money and is usually expressed as a percentage of the principal.

*Liabilities* -the obligation of a company or individual to repay their debt.

*Liquidity* -refers to the ease in which an asset can be converted to cash. Real estate is considered an illiquid asset, as it may take months to sell.

*Manipulation* -refers to the interfering with the market, and is illegal. This can occur through insider trading, pools, churning, wash trade, and bear raid. These methods cause the price of the asset to increase or decrease.

*Maturity Date* -the date on which the principal of a loan or bond is to be repaid in full.

*Penny Stock* -a stock that is traded for less than \$5 per share. Low price and potential for fast growth attracts investors. The low price per share makes these stocks a high risk investment. They are also vulnerable to manipulation.

*Principal* -the initial amount of money lent to a borrower

*Preferred Stock* -refers to a security that entitles a greater claim on earnings and assets than a common stock. Dividends are typically paid out before those to common stock holders. Has a fixed dividend and equity by giving up the potential to appreciate (also referred to as a fixed-income security). In addition, preferred stockholders usually have to give up their right to vote within the company.

*Price-to-Earnings Ratio (P/E)* -a financial ratio that compares the share price with profit or net income. High P/E generally means better expected future growth on earnings. Can be used to compare companies within an industry or compare them to the whole market. The term is used interchangeably with multiple.

*Stock* - share in ownership in a company.

*Stock Dividend* -a dividend paid in the company's stock instead of cash.

*Shorting* -the process of selling a stock or commodity for less than its actual value.

*Volume* -an important indicator for analyzing market activity. Low volume indicates illiquidity, thus making it more risky. The volume reflects the supply and demand of the stock.

*Yield* -income return on an investment, representing the interest or dividend, and expressed as a percentage based on the current market value or investment cost. Can also be calculated as a ratio, and thus can't always be compared as equals.

### **1.3 History of the Stock Market**

The exchange of goods, services, and money has been in practice for centuries. A stock market is a public market that allows the exchange of assets, in the form of stocks and derivatives. The stock market allows companies to raise monetary capital through investors. In return the investor may receive monetary gains through an increasing stock price. Stock markets have been established as early as the 16<sup>th</sup> century.<sup>1</sup> The New York Stock Exchange, originally called The Stock Exchange Office, was established in 1792 and is the oldest of the American stock markets.<sup>1</sup> The National Association of Securities Dealers Automated Quotation (NASDAQ) was founded in 1971, and was the first electronically automated stock market and is currently the most efficient stock exchange in the world.<sup>5</sup> The NASDAQ surpassed the average trading volume of the NYSE for the first time in October 2004.<sup>5</sup> Generally speaking, each country has its own stock market which includes a list of companies which operates primarily within that country's boundaries.

There have been periods throughout the history of stock markets where prices crashed to record lows, and where prices rocketed to achieve record highs. These are referred to as Bear and Bull Markets, respectively. The Great Depression was a result of the Great Crash of 1929 in which prices crashed and investors lost fortunes.<sup>5</sup> This resulted in strong pessimism amongst investors, and in an attempt to recover the economy, Congress passed a series of acts to help

regulate the markets. The regulations instated by these acts were enforced by the Securities and Exchange Commission (SEC).<sup>5</sup>

In October 1987 the stock market suffered a loss of about 1/3 of its value in a 2 week period.<sup>6</sup> September 2000 through January 2001 the NASDAQ dropped 45.9%.<sup>7</sup> This crash was a result of corporate corruption (companies fraudulently inflated profits using accounting loopholes to hide debt), overvalued stocks, day traders and momentum investors, conflict of interest (favorable rating would be issued on stocks even though the companies were in financial trouble).<sup>7</sup> As a result of this crash, regulations were placed on day traders requiring a minimum account balance to actively trade.<sup>7</sup> CEO's were also required to sign balance sheets, and fraud prosecution resulted in higher penalties.<sup>7</sup> Furthermore, accounting reforms were passed so that investors could better judge the profitability of a company.<sup>7</sup>

October 2008 brought another market crash. The Dow Jones Industrial Average (DJIA) lost over 2000 points.<sup>8</sup> The S&P fell more than 20% as well during this period.<sup>8</sup> This market crash was due to loans being given to individuals with poor credit, who ended up defaulting on their payments.<sup>8</sup> Many theorists believe that the stock market crashes become more prominent because investors become fearful and try to sell off their assets, which causes further decline in prices.<sup>8</sup>

The current state of the economy is hard to predict. May 2010 showed this with a flash crash of the DOW, which lost 1000 points in a day.<sup>9</sup> This crash is probably due in part to the nervousness that investors display by selling their assets when they begin to level out or decline.<sup>9</sup> Only time will tell how stable the economy truly is and investors should be cautious with their investments.

#### **1.4 Investment versus Speculation**

"An investment operation is one which, upon thorough analysis promises safety of principal and an adequate return. Operations not meeting these requirements are speculative."<sup>2</sup> In other words, a speculation is an investment that is made without knowledge of the actual value. Speculation might better be defined as investment actions that are intended to take advantage of market fluctuations, opposed to actions made with the purpose of providing good income or capital gain due to the assets real and/or increasing value.<sup>18</sup> The asset price is important for the investor, whereas the change in price trend is more important to the speculator. It is possible to make regular profits through speculation, but those who do this seek to minimize the associated risk.<sup>18</sup> In order to do this, like a professional gambler, the individual must be well aware of the risk and rewards and to maximize their edge with sophisticated techniques.<sup>18</sup> This would require much more time and work than an ordinary individual would be able to provide towards his/her investment plans, and thus should be avoided. Thus individuals should stay away from speculative strategies, and support their investment decisions with reasoning.



## **Chapter 2 – Investment Strategies**

There are a number of strategies that investors can use when investing in the stock market. These strategies vary in the frequency of trades made, the number of stocks purchased, as well as the type of stocks purchased.

### **2.1 Day Trading**

Investors use this strategy in hopes of beating the market through profitable market trading. In other words, the investor will buy stocks at low values and sell them at high values. One important point that investors using this strategy must remember, is that each purchase or sale made will require a commission to be paid to the stock broker. Day trading is very speculative by nature, and can pose huge risks to an individual.

A recent variation of this method, High Frequency Traders (HFTs), is being employed with the aid of super-fast computers which trade without human supervision. In this method every second and every penny counts, as the computers buy underpriced securities and sell them overpriced based on complex mathematical programming. Due to this advanced technology, regulators of the Securities and Exchange Commission will be implementing ‘circuit breakers’ to momentarily freeze trading to prevent selling during a freefall from continually dropping prices.<sup>4</sup>

### **2.2 Dollar Cost Averaging**

When an investor purchases assets based on a fixed dollar amount regardless of share price. This results in fewer shares being purchased when prices are high and more shares being purchased when prices are low. This method causes the average price per share to become smaller over time. This allows investors who don’t have the money to make a lump purchase still

increase the amount of holdings. It also reduces the risk of a large price swing after a lump purchase is made.

### **2.3 Long Term Investing**

Long term investing can be extremely profitable, as some companies will continue to grow over the long term but may see peaks and valleys in their asset price in the short term. Long term investment reduces the immediate risks associated with the market. However, stocks should never be bought and then just left alone. They should be monitored and sold if the stock becomes overpriced in the market.

### **2.4 Investment Diversification**

Diversification of a portfolio can lower risks for an investor associated with a company or a sector. Some may argue that diversification will water out the gains of a good company with the smaller gains of other companies. However, it is difficult to choose one company that will outperform all others. In addition, through diversification an investor increases their chances of picking the next 'Microsoft' stock. Meaning that with diversification, an individual increases the chances of having a company in their portfolio, which makes extraordinary profits.

#### **2.4.1 Growth Investing**

This is a strategy of buying stocks that show good prospective growth.<sup>12</sup> These stocks are expected to grow above the industry and/or stock market rate.<sup>12</sup> Growth investing comes with potential risks.<sup>13</sup> Investors focus on companies' potential and disregard the price, as they believe the company will exceed its current value.<sup>13</sup> An investor will look at younger companies, which

have more room for growth, in industries that are rapidly expanding.<sup>13</sup> Most growth companies do not pay dividends, rather any earnings made are reinvested to future developments, so investors profit through a raise in stock price as the company begins to grow and expect that increases in company earnings will relate to an increase in the stock price.<sup>13</sup> When looking at growth long term trends of growth are stronger evidence for continual growth, also the size of the company affects how much growth it should see to be a strong candidate for investment.

### **2.4.2 Value Investing**

This is a strategy of selecting stocks that are trading for less than they are actually worth. Stocks can become undervalued as the market overreacts to bad news.<sup>10</sup> The profit for the investor is made once these stocks have returned to their actual value or become overvalued. Value investors will find stocks that have a below average price to earnings ratio and/or high dividend yields.<sup>10</sup> The problem with value investing is that after a price drop the price could still continue to go down.<sup>10</sup>

The stock market is efficient, meaning that one person is wrong and one person is right when an asset is traded.<sup>11</sup> When looking at stocks, the investor should try to determine why it is priced the way it is. Is it low due to irrational market actions, or because the company is going downhill? The stocks that will most likely be underpriced due to irrational decisions are the ones that people don't look at, which usually means the small companies, however these are also at an increased risk to the investor. A good way to determine if the asset is well priced or not is by comparing the company with other companies within the same sector and comparing the company and sector with the entire market. Perhaps the most important part of value investing is

patience, as these stocks contain more risk they are more likely to fluctuate in value, and buying on the low and selling on the high are imperative for making profit.<sup>11</sup>

### **2.4.3 Growth at a Reasonable Price (GARP)**

This strategy is a hybrid of growth and value investing. These types of investors look at companies that are showing consistent growth earnings that are above market levels, but that are also moderately priced.<sup>16</sup> This investment plan eliminates the extremes that growth and value investing have.<sup>16</sup> Investors using this method can use the PEG ratio, or price/earnings growth, which should have a ratio of about 1 or less.<sup>16</sup> In a bear market this strategy usually gives higher returns than pure growth investing.<sup>16</sup>

## **Chapter 3: Choices for the Investor**

There are a number of choices that an investor has besides just the stock market. While this project didn't attempt to explore any of the advantages or disadvantages of these in comparison to the stock market, some were mentioned with short detail.

### **3.1 Asset Allocation**

A well designed long term asset allocation is crucial to the success of any investment program. Spreading assets across a wide array of weakly correlated investments can reduce the short term volatility without giving up much performance in the long run. (3) By diversifying within an industry the risk associated with a specific company is significantly reduced. By diversifying in the whole market, the risk of a specific industry is reduced. However, the market risk is always present and can't be reduced through diversification. The only way to eliminate market risk is to not invest in the market. However, an investor has other options to reduce the risk on their investments. These options include bonds and CDs as mentioned below.

### **3.2 Mutual Funds**

Mutual Funds are professionally managed profiles using pools of money collected from investors, who are charged with a commission. There are many mutual fund companies and advisors available. However, it is difficult to choose the one that will outperform the others, which they all claim to be able to do. Mutual funds are useful however, for easily diversifying a portfolio, as they contain numerous companies.

### **3.3 Certificates of Deposit**

Certificates of Deposit (CD's) are investments with banks or credit unions, where the investor receives higher fixed interest rates for not withdrawing for a fixed period of time. Most banks offer CDs to anyone looking to invest, and there are a number of CD options available, including some that allow the investor to make a onetime readjustment of the interest rate, in the case that it goes up. The easiest way to determine CD options is to visit a local bank.

### **3.4 Bonds**

Bonds are a form of investment, where the investor loans money and is paid interest periodically. It entitles the holder to a creditor stake in the company as opposed to an equity stake as in stocks.

### **3.5 Money Market**

The money market, consists of investments that are about a year in length. These investments provide liquidity to the investor.

### **3.6 Stock Market**

Investing in the stock market can yield larger gains than other forms of investment. However, there is a risk of losing money in the stock market as well.

## **Chapter 4: Simulations**

This project conducted a total of four simulations all using the Virtual Stock Exchange. The simulations followed the same set of rules as defined in the goals and methods section of Chapter 1. The simulations were Large Cap-Value, Small Cap-Value, Large-Cap Growth, and Small Cap-Growth. Value and Growth investing are discussed in Chapter 2. Stocks were bought and sold with the intent of making a profit. Portfolios and Company Profiles were constructed using <http://finance.yahoo.com> and company websites.

The purpose of the following 4 simulations is to compare how growth stocks compare to value stocks, and how large companies compare to small companies in terms of investment profitability. The GARP strategy wasn't employed in any simulations because it is a mix of the two strategies, and thus should have results that fall in between the two. The same reasoning is used for not including medium sized companies.

### **4.1 Large Cap-Value Investing**

#### **4.1.1 Simulation Overview**

This simulation consisted of large businesses whose stocks are considered value stocks. Stocks were screened for having a market cap of greater than 10 billion and having a P/E, P/B, and/or P/S of less than 1. The table below shows day to day results of the simulation, including market equity, cash, total equity and returns.

Date	Market Value	Total Cash	Total Equity	Return
6/9/2010	\$12,180	\$87,505	\$99,685	-0.32%
6/10/2010	\$12,680	\$87,505	\$100,185	0.19%
6/11/2010	\$12,583	\$87,505	\$100,088	0.09%
6/12/2010	\$12,583	\$87,505	\$100,088	0.09%
6/13/2010	\$12,583	\$87,505	\$100,088	0.09%
6/14/2010	\$12,678	\$87,505	\$100,183	0.18%
6/15/2010	\$15,598	\$84,954	\$100,552	0.55%
6/16/2010	\$15,652	\$84,954	\$100,606	0.61%
6/17/2010	\$15,635	\$84,954	\$100,589	0.59%
6/18/2010	\$15,667	\$84,954	\$100,621	0.62%
6/19/2010	\$15,667	\$84,954	\$100,621	0.62%
6/20/2010	\$15,667	\$84,954	\$100,621	0.62%
6/21/2010	\$15,724	\$84,954	\$100,678	0.68%
6/22/2010	\$15,429	\$84,954	\$100,383	0.38%
6/23/2010	\$15,459	\$84,954	\$100,413	0.41%
6/24/2010	\$15,108	\$84,954	\$100,062	0.06%
6/25/2010	\$15,161	\$84,954	\$100,115	0.12%
6/26/2010	\$15,161	\$84,954	\$100,115	0.12%
6/27/2010	\$15,161	\$84,954	\$100,115	0.12%
6/28/2010	\$14,992	\$84,954	\$99,946	-0.05%
6/29/2010	\$14,372	\$84,954	\$99,326	-0.67%
6/30/2010	\$33,047	\$65,742	\$98,789	-1.21%
7/1/2010	\$32,701	\$65,742	\$98,443	-1.56%
7/2/2010	\$32,521	\$65,742	\$98,263	-1.74%
7/3/2010	\$32,521	\$65,742	\$98,263	-1.74%
7/4/2010	\$32,521	\$65,742	\$98,263	-1.74%
7/5/2010	\$32,521	\$65,742	\$98,263	-1.74%
7/6/2010	\$33,101	\$65,742	\$98,843	-1.16%
7/7/2010	\$34,105	\$65,742	\$99,847	-0.15%
7/8/2010	\$34,467	\$65,742	\$100,209	0.21%
7/9/2010	\$35,221	\$65,742	\$100,963	0.96%
7/10/2010	\$35,221	\$65,742	\$100,963	0.96%
7/11/2010	\$35,221	\$65,742	\$100,963	0.96%
7/12/2010	\$34,850	\$65,742	\$100,592	0.59%
7/13/2010	\$20,214	\$80,850	\$101,064	1.06%
7/14/2010	\$20,065	\$80,850	\$100,915	0.92%
7/15/2010	\$20,165	\$80,850	\$101,015	1.02%
7/16/2010	\$19,411	\$80,850	\$100,261	0.26%

Figure 1 – Large Value Portfolio



#### 4.1.2 WLP – WellPoint Inc.

Index Membership: S&P 500, S&P 1500 Super Comp

Sector: Healthcare

Industry: Health Care Plans

A US company, Wellpoint offers managed careplans. The company was previously called Anthem Inc. and was founded in 1944 in Indianapolis, Indiana. The company has a Market cap of over 20 Billion Dollars and a price to book ratio of less than 1. Medical enrollment in the first quarter rose by 165,000. Net income from the first quarter was just under \$2 per share, and is estimated to be \$6 per share for the full year. First quarter reports a 2.8% increase in total operating revenue and 4.4% in operating gain.

Shares of WLP were bought and sold and the following table shows the date of the transaction, the price per share that the transaction was made at, the number of shares, and the net profit/cost of the transaction.

WLP	Date	Type	Price	Quantity	Transaction Total
	6/8/2010	buy	\$53.70	100	(\$5,380)
	6/30/2010	buy	\$49.25	100	(\$4,935)
	6/30/2010	buy	\$49.32	100	(\$4,942)
	7/13/2010	sell	\$51.70	200	\$10,330

Figure 2 – WLP Trades

Share price of WLP over the course of the simulation saw one major valley associated with the beginning of July. Prices had been dropping for about two weeks prior to hitting bottom and then began to return at a slightly slower rate. The dip began around the announced time of a 20% increase in health costs for the same coverage or a 13% increase for fewer benefits.<sup>19</sup> The health industry as a whole saw an increase in share prices for about a week after the fact. The

following graph shows WLP share price from the beginning of the simulation until now. Share price is on the vertical axis, while the date is on the horizontal axis.

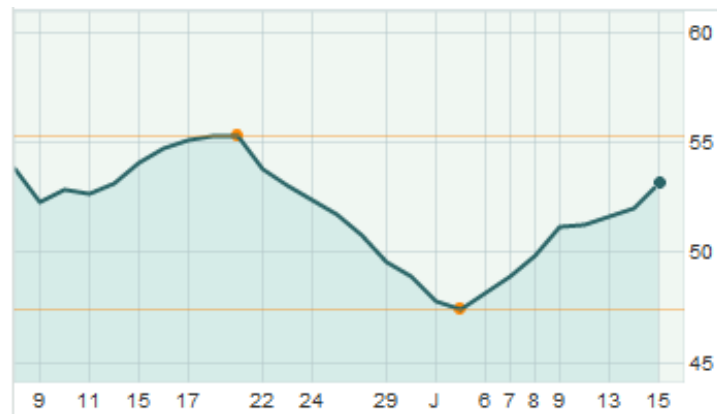


Figure 3 – WLP stock price trend

#### 4.1.3 STI – Sun Trust Banks, Inc.

Index Membership: S&P 500, S&P 1500 Super Comp

Sector: Financial

Industry: Money Center Banks

The holding company for Sun Trust Bank, STI provides financial services to consumer and corporate customers within the US. The company is divided into four segments: retail and commercial, wealth and investment management, corporate and investment banking, and household lending. Each segment offers a variety of services to customers, mostly associated with lending, borrowing, and investing. The company was founded in 1891, and is based in Atlanta, Georgia. The company has a market cap of 11.65 billion dollars and a price to book ratio of 0.72.

The following graph shows the share price since the purchase of stocks at the beginning of the simulation, share prices are on the vertical axis and the date is on the horizontal axis. Some

week to week fluctuation can be seen, but most noticeable are: the valley corresponding to the beginning of July, the peak that followed about a week later and the start of another valley only a few days after the peak. The graph shows that the company had a strong return after a more gradual decline to the first valley.



Figure 4 – STI stock value trend

#### 4.1.4 RTP – Rio Tinto plc

Sector: Basic Materials

Industry: Steel & Iron

RTP locates, mines, and processes mineral resources, including aluminum, copper, gold, silver, nickel and diamonds. The company operates globally and is based in London, UK. It was founded in 1873.

RTP is listed in the London Stock Exchange; however shares can be purchased through an American Depository Receipt (ADR) from JPMorgan Chase Bank NA.<sup>20</sup> RTP holds between 5 and 40 percent of the market for each commodity market, and is generally among the top five globally in terms of volume produced. Industry growth is expected through higher demands from

China and India as urbanization trends continue.<sup>21</sup> Growth seems to grow with or slightly faster than global GDP.<sup>21</sup>

The following table shows transaction made in the course of the simulation, and includes purchase date, price, quantity, and total cost/profit. The following graph details how the share value has changed over the course of the simulation. The graph shows that share prices began to peak shortly after the simulation onset and continued to rise for a couple weeks until late June when they suddenly dropped. A slight recovery was made, but it appears that another valley is setting in. Share prices didn't fluctuate by more than \$10, although that is about 20% of the share price.

RTP	Date	Type	Price	Quantity	Transaction Total
	6/8/2010	buy	\$45.64	100	(\$4,574)
	6/30/2010	buy	\$44.43	100	(\$4,453)
	7/13/2010	sell	\$47.88	100	\$4,778

Figure 5 – RTP trades



Figure 6 – RTP stock price trend

#### 4.1.5 BMJ – Bristol-Myers Squibb Company

Index Memberships: S&P 100, S&P 500, S&P 1500 Super Comp

Sector: Healthcare

Industry: Drug Manufacturers-Major

BMY is a global biopharmaceutical company that discovers, develops, and delivers medicine to patients. The company focuses on diseases and disorders such as diabetes, hepatitis, cardiovascular disease, HIV/AIDS, and others which leave patients with unmet medical needs. The company also has ownership to various compounds that are in phase III clinical trials. The company was founded in 1887 in New York City, New York.

The following graph shows the share prices (vertical axis) corresponding to the day of simulation (horizontal axis). The company saw an initial gain in share price after the simulation began, and has witnessed a small dip in share prices associated with the beginning of July, as seen by the other companies in this simulation. The share price quickly regained, but it appears that the company could be entering another dip in share price.

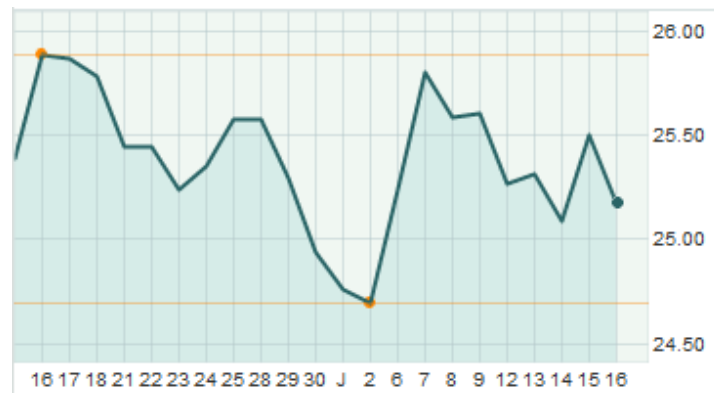


Figure 7 BMY – stock price trend

## **4.2 Small Cap-Value Investing**

### **4.2.1 Simulation Overview**

This simulation consisted of small businesses whose stocks are considered value stocks. Stocks were screened for having a market cap of less than 1 million and having a P/E, P/B,

and/or P/S of less than 1. The table below shows day to day results of the simulation, including market equity, cash, total equity and returns. Six companies were included in this simulation.

Date	Market Value	Total Cash	Total Equity	Return
6/9/2010	\$10,770	\$88,989.90	\$99,759.90	-0.24%
6/10/2010	\$11,410	\$88,989.90	\$100,399.90	0.40%
6/11/2010	\$11,590	\$88,989.90	\$100,579.90	0.58%
6/12/2010	\$11,590	\$88,989.90	\$100,579.90	0.58%
6/13/2010	\$11,590	\$88,989.90	\$100,579.90	0.58%
6/14/2010	\$11,410	\$88,989.90	\$100,399.90	0.40%
6/15/2010	\$27,596	\$73,703.90	\$101,299.90	1.30%
6/16/2010	\$28,134	\$73,703.90	\$101,837.90	1.84%
6/17/2010	\$27,446	\$73,703.90	\$101,149.90	1.15%
6/18/2010	\$27,299	\$73,703.90	\$101,002.90	1.00%
6/19/2010	\$27,299	\$73,703.90	\$101,002.90	1.00%
6/20/2010	\$27,299	\$73,703.90	\$101,002.90	1.00%
6/21/2010	\$26,874	\$73,703.90	\$100,577.90	0.58%
6/22/2010	\$26,125	\$73,703.90	\$99,828.90	-0.17%
6/23/2010	\$25,954	\$73,703.90	\$99,657.90	-0.34%
6/24/2010	\$25,405	\$73,703.90	\$99,108.90	-0.89%
6/25/2010	\$25,783	\$73,703.90	\$99,486.90	-0.51%
6/26/2010	\$25,783	\$73,703.90	\$99,486.90	-0.51%
6/27/2010	\$25,783	\$73,703.90	\$99,486.90	-0.51%
6/28/2010	\$25,506	\$73,703.90	\$99,209.90	-0.79%
6/29/2010	\$24,090	\$73,703.90	\$97,793.90	-2.21%
6/30/2010	\$46,484	\$49,878.90	\$96,362.90	-3.64%
7/1/2010	\$44,936	\$49,878.90	\$94,814.90	-5.19%
7/2/2010	\$44,562	\$49,878.90	\$94,440.90	-5.56%
7/3/2010	\$44,562	\$49,878.90	\$94,440.90	-5.56%
7/4/2010	\$44,562	\$49,878.90	\$94,440.90	-5.56%
7/5/2010	\$44,562	\$49,878.90	\$94,440.90	-5.56%
7/6/2010	\$42,774	\$49,878.90	\$92,652.90	-7.35%
7/7/2010	\$43,888	\$49,878.90	\$93,766.90	-6.23%
7/8/2010	\$44,500	\$49,879	\$94,379	-5.62%
7/9/2010	\$46,266	\$49,879	\$96,145	-3.86%
7/10/2010	\$46,266	\$49,879	\$96,145	-3.86%
7/11/2010	\$46,266	\$49,879	\$96,145	-3.86%
7/12/2010	\$43,302	\$52,518.90	\$95,821	-4.18%
7/13/2010	\$39,340	\$58,278.90	\$97,619	-2.38%
7/14/2010	\$42,134	\$58,278.90	\$100,413	0.41%
7/15/2010	\$42,062	\$58,278.90	\$100,341	0.34%
7/16/2010	\$39,430	\$58,278.90	\$97,709	-2.29%

Figure 8 – Small Value Portfolio

#### 4.2.2 FUQI – Fuqi International Inc.

Index Membership: N/A

Sector: Consumer Goods

Industry: Recreational Goods, Other

FUQI designs, develops, promotes, and sells precious metal jewelry in the Peoples Republic of China. The company offers many gold products, but also has platinum, palladium, and diamond products. The company was founded in 2001 and is headquartered in Shenzhen, the Peoples Republic of China.

FUQI has a market cap of 200.3 million, Price to Sales ratio of .47, and price to book ratio of .75. The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Most notable is the decline in share price that started about a week after simulation onset. The company began to show recovery but has entered into another decline.

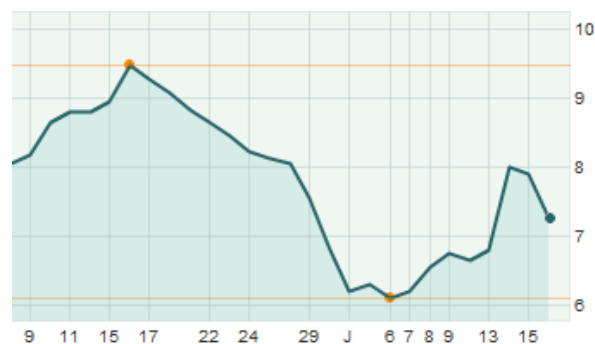


Figure 9 – FUQI stock price trend

#### 4.2.3 XIN – Xinyuan Real Estate Co., Ltd.

Index Membership: N/A

Sector: Industry goods

Industry: Residential Construction

XIN provides property management and engages in residential real estate development in the Peoples Republic of China. Development and construction is performed in various provinces. Projects are focused on multi-layer apartment buildings and sub-high-rise apartment buildings in addition to schools and facilities. The company is also involved in intercom systems installation, landscaping, real estate sale, and purchase and lease businesses. The company was founded in 1997 and is headquartered in Beijing, the Peoples Republic of China.

The company has a market cap of 189.39 million, a price to sales ratio of .38, and a price to book ratio of .43. The share price over the course of the simulation varied greatly, but showed a general decline.

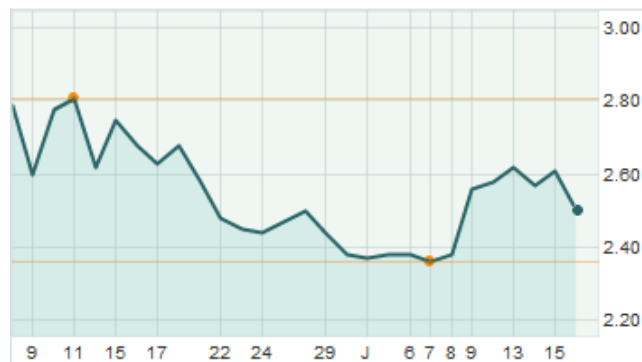


Figure 10 – XIN stock price trend

#### 4.2.4 BZH – Beazer Homes USA Inc.

Index Membership: N/A

Sector: Industrial Goods

Industry: Residential Construction

BZH designs, builds, and sells single and multi family homes for all types of buyers (entry-level, moving-up, retirement) in the US. The company also provides title insurance



services to customers. Houses are sold through commissioned employees and independent brokers. The company was founded in 1985 and is headquartered in Atlanta, Georgia.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). The share price was on the decline since the beginning and bottomed at the beginning of July. The share price then began a slow recovery, with a drop at the end of simulation.

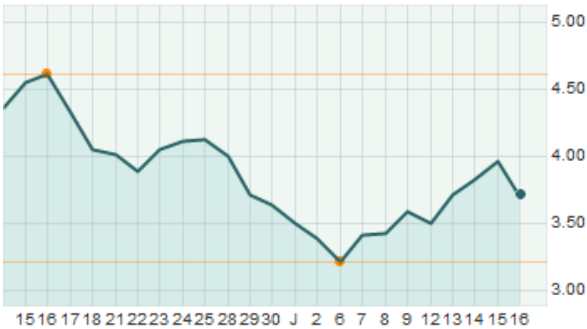


Figure 11 – BZH stock price trend

**4.2.5 BZ – Boise, Inc.**

Index Membership: N/A

Sector: Consumer Goods

Industry: Paper and Paper Products

BZ manufactures and sells a variety of paper and packaging products to North America. Some of the product is demand-driven and sales can reflect the state of the economy. The company was founded in 2007 in Boise, Idaho.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Share price declined shortly after simulation onset, bottoming in the beginning of July, and making a recovery through mid-July, regaining most of its initial value.



Figure 12 – BZ stock price trend

#### 4.2.6 USMO – USA Mobility, Inc.

Index Membership: N/A

Sector: Technology

Industry: Wireless Communications

USMO provides wireless communications to medical and governmental facilities, large enterprises and through a third party mobile communication and gps. The company headquarters is in Alexandria, Virginia.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). The share price had a few peaks and valleys throughout the simulation, with simulation low at the beginning of July, and a high about a week later, only to drop back down.

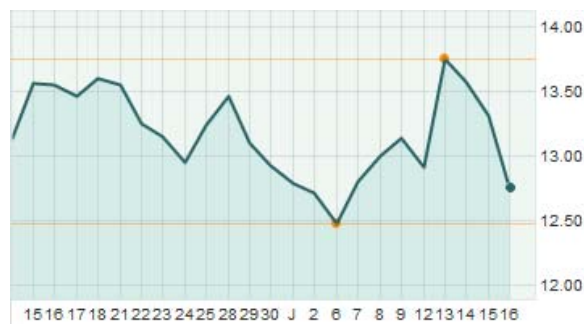


Figure 13 – USMO stock price trend



Date	Market Value	Total Cash	Total Equity	Return
6/9/2010	\$26,150	\$73,487	\$99,637	-0.36%
6/10/2010	\$26,695	\$73,487	\$100,182	0.18%
6/11/2010	\$26,757	\$73,487	\$100,244	0.24%
6/12/2010	\$26,757	\$73,487	\$100,244	0.24%
6/13/2010	\$26,757	\$73,487	\$100,244	0.24%
6/14/2010	\$26,867	\$73,487	\$100,354	0.35%
6/15/2010	\$58,343	\$43,053.55	\$101,397	1.40%
6/16/2010	\$58,700	\$43,053.55	\$101,753	1.75%
6/17/2010	\$58,943	\$43,053.55	\$101,996	2.00%
6/18/2010	\$59,376	\$43,053.55	\$102,429	2.43%
6/19/2010	\$59,376	\$43,053.55	\$102,429	2.43%
6/20/2010	\$59,376	\$43,053.55	\$102,429	2.43%
6/21/2010	\$59,814.50	\$43,053.55	\$102,868	2.87%
6/22/2010	\$59,363.50	\$43,053.55	\$102,417	2.42%
6/23/2010	\$59,273	\$43,053.55	\$102,327	2.33%
6/24/2010	\$58,429.50	\$43,053.55	\$101,483	1.48%
6/25/2010	\$58,801.50	\$43,053.55	\$101,855	1.86%
6/26/2010	\$58,801.50	\$43,053.55	\$101,855	1.86%
6/27/2010	\$58,801.50	\$43,053.55	\$101,855	1.86%
6/28/2010	\$58,341	\$43,053.55	\$101,395	1.39%
6/29/2010	\$55,814	\$43,053.55	\$98,868	-1.13%
6/30/2010	\$101,942	(\$4,429.46)	\$97,513	-2.49%
7/1/2010	\$101,930	(\$4,429.46)	\$97,501	-2.50%
7/2/2010	\$101,488	(\$4,429.46)	\$97,059	-2.94%
7/3/2010	\$101,488	(\$4,429.46)	\$97,059	-2.94%
7/4/2010	\$101,488	(\$4,429.46)	\$97,059	-2.94%
7/5/2010	\$101,488	(\$4,429.46)	\$97,059	-2.94%
7/6/2010	\$101,391	(\$4,429.46)	\$96,962	-3.04%
7/7/2010	\$104,732.50	(\$4,429.46)	\$100,303	0.30%
7/8/2010	\$105,108	(\$4,429.46)	\$100,679	0.68%
7/9/2010	\$105,695	(\$4,429.46)	\$101,266	1.27%
7/10/2010	\$105,695	(\$4,429.46)	\$101,266	1.27%
7/11/2010	\$105,695	(\$4,429.46)	\$101,266	1.27%
7/12/2010	\$105,083	(\$4,429.46)	\$100,653	0.07%
7/13/2010	\$98,284	\$2,999.64	\$101,283	1.28%
7/14/2010	\$98,481	\$2,999.64	\$101,481	1.48%
7/15/2010	\$98,807	\$2,999.64	\$101,807	1.81%
7/16/2010	\$96,037	\$2,999.64	\$99,037	-0.96%

Figure 15 – Large Growth Portfolio

### 4.3.2 NVO – Novo Nordisk A/S

Index Membership: N/A

Sector: Healthcare

Industry: Drug Manufacturers – Other

NVO discovers, develops, manufactures, and markets pharmaceutical products. The company is branched into two focuses, one of which is diabetic care through various insulin supplement sales. The other is biopharmaceuticals, which treat hemophilia, and various hormone therapies. Products are sold to subsidiaries, distributors and independent agents across seven countries. The company was founded in 1925 and is based in Bagsvaerd, Denmark.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Share value continually rose with a small dip late June, beginning of July. The asset grew a total of about 13% over the course of the simulation.

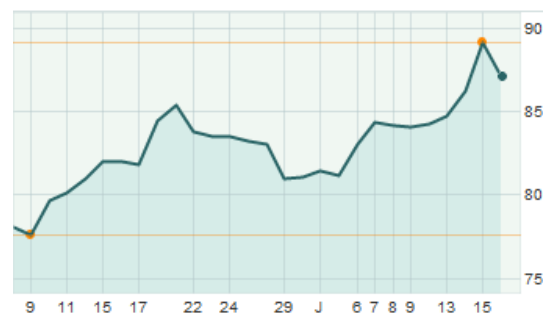


Figure 16 – NVO stock price trend

### 4.3.3 CPB – Campbell Soup Co.

Index Membership: N/A

Sector: Consumer Goods

Industry: Processed and Packaged Goods

CPB manufactures and markets convenient food products. Food products are distributed to many countries throughout the world. Products include soup, crackers, biscuits, cookies, sauce, beverages and more. CPB sells products to retail food chains, mass discounters, and other commercial establishments. The company was founded in 1869 and is based in Camden, New Jersey.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). The share price rose after simulation onset, but quickly plummeted to a bottom value at the beginning of July. About a third of the loss was recovered over the final week of simulation.



Figure 17 - CPB stock price trend

#### 4.3.4 K – Kellogg Company

Index Membership: N/A

Sector: Consumer Goods

Industry: Processed and Packaged Goods

K manufactures and markets cereal and other convenient foods, including cookies, crackers, pastries, and more. Most products are distributed through convenient stores and grocery

stores. Products are sold in North America, Europe, Latin America, and Asia Pacific. The company was founded in 1906 and is based in Battle Creek, Michigan.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). This stock showed a huge loss in share price over the few weeks after the simulation began, bottoming at the end of June and showed small recovery a week into July. The share price began to drop again at simulation end.

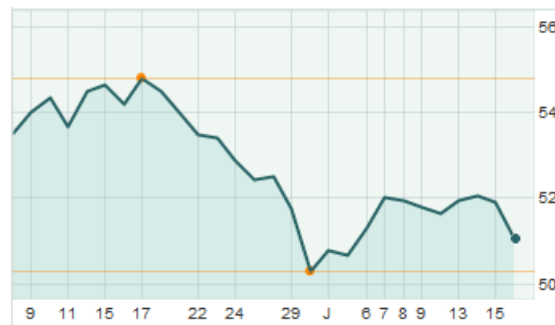


Figure 18 – K stock price trend

#### 4.3.5 SWN – Southwestern Energy Co.

Index Membership: N/A

Sector: Basic Materials

Industry: Independent Oil and Gas

SWN explores, develops, and produces natural gas and crude oil in the US. The company performs drilling and marketing and transportation of gas. The company also markets and transports gas of third party companies. SWN estimated the equivalent of 3,657 billion ft<sup>3</sup> of gas, in gas and oil reserves combined. The company was founded in 1929 and is based in Houston, Texas.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Share price rose slightly in the first week of simulation and steadily dropped thereafter creating a total loss of about 13% by simulation end.



Figure 19 – SWN stock price trend

#### 4.3.6 CELG – Celgene Corporation

Index Membership: S&P 500, S&P 1500 Super Comp, Nasdaq 100

Sector: Healthcare

Industry: Biotechnology

CELG discovers, develops, and commercializes cancer and immune-inflammatory therapies internationally. The company sells a number of products and has many more that are in clinical trials. The company is also doing stem cell research from human placenta and umbilical cord derivatives. CELG was founded in 1980 and is based in Summit, New Jersey.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). The share price rose after an immediate loss, but then plummeted at the beginning of July. However, the share price showed recovery following this and to the end of the simulation, which ended in a drop in price.





Figure 20 – CELG stock price trend

### 4.3.7 BIDU – Baidu, Inc.

Index Membership: Nasdaq 100, AMEX Internet

Sector: Technology

Industry: Internet Information Providers

BIDU is a Chinese and Japanese language internet search engine. The company also provides instant messaging services and online marketing services. The company makes online marketing sales directly as well as through distributors. The company was founded in 2000 and is based in Beijing, the Peoples Republic of China.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). The share price was relatively stable until near the end of July, when a sudden drop in share price lasted for a week until the price began to show recovery.



Figure 21 – BIDU stock price trend

#### 4.3.8 AAPL – Apple Inc.

Index Membership: S&P 100, S&P 500, S&P 1500 Super Comp, Nasdaq 100

Sector: Technology

Industry: Personal Computers

Apple designs, manufactures and sells electronic devices including computers, mp3 players, and smart phones, and the related software. Products are sold world-wide through retailers, distributors, and online websites. The company also has an online music, movie, and application store. The company was founded in 1976 and is based in Cupertino, California.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). After the stock was purchased a rise in stock prices was witnessed. In late June and early July prices sharply dropped. This could be in part due to several issues with the released iPhone 4g. Prices recovered slightly before declining again.

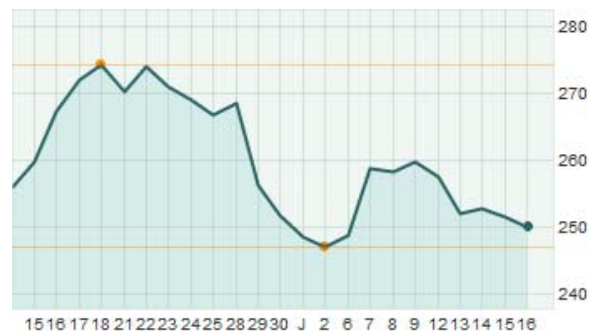


Figure 22 – AAPL stock price trend

#### 4.3.9 MA – Mastercard Incorporated

Index Membership: N/A

Sector: Services

Industry: Business Services

MA offers transaction processing, credit, electronic cash and travelers checks to customers. Payment solutions are also offered by the company. The company was founded in 1966 and is based in Purchase, New York.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Share prices showed an increase following simulation onset, but declined near the end of June and remained low through the first week of July. Share prices recovered but dropped sharply at the simulation offset.

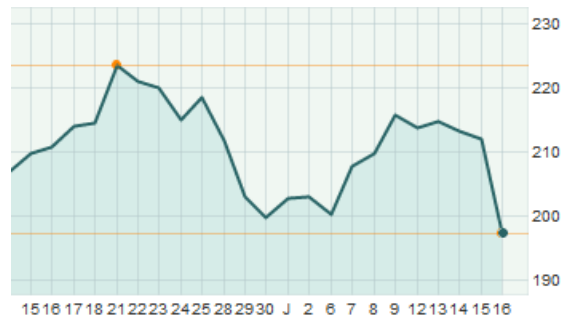


Figure 23 – MA stock price trend

## **4.4 Small Cap-Growth Investing**

### **4.4.1 Simulation Overview**

This simulation consisted of small businesses whose stocks are considered growth stocks. The table below shows the company symbol, date of transaction, price of the asset on date of transaction, number of shares purchased, the total cost or proceed, and total remaining cash after the transaction.

Date	Market Value	Total Cash	Total Equity	Return
9-Jun	\$44,691	\$54,680.50	\$99,371.50	-0.63%
10-Jun	\$45,112.85	\$54,680.50	\$99,793.35	-0.21%
11-Jun	\$45,582	\$54,680.50	\$100,262.50	0.26%
12-Jun	\$45,582	\$54,680.50	\$100,262.50	0.26%
13-Jun	\$45,582	\$54,680.50	\$100,262.50	0.26%
14-Jun	\$46,257	\$54,680.50	\$100,937.50	0.94%
15-Jun	\$49,275	\$52,001.40	\$101,276.40	1.28%
16-Jun	\$49,360	\$52,001.40	\$101,361.30	1.36%
17-Jun	\$49,375.50	\$52,001.40	\$101,376.90	1.38%
18-Jun	\$49,615	\$52,001.40	\$101,616.40	1.62%
19-Jun	\$49,615	\$52,001.40	\$101,616.40	1.62%
20-Jun	\$49,615	\$52,001.40	\$101,616.40	1.62%
21-Jun	\$49,642	\$52,001.40	\$101,643.40	1.64%
22-Jun	\$49,544.10	\$52,001.40	\$101,545.50	1.55%
23-Jun	\$49,129	\$52,001.40	\$101,130.40	1.13%
24-Jun	\$48,952	\$52,001.40	\$100,953.40	0.95%
25-Jun	\$49,654.40	\$52,001.40	\$101,655.80	1.66%
26-Jun	\$49,654.40	\$52,001.40	\$101,655.80	1.66%
27-Jun	\$49,654.40	\$52,001.40	\$101,655.80	1.66%
28-Jun	\$49,204	\$52,001.40	\$101,205.40	1.21%
29-Jun	\$47,047.10	\$52,001.40	\$99,048.50	-0.05%
30-Jun	\$82,144	\$17,879.40	\$100,023.40	0.02%
1-Jul	\$81,156	\$17,879.40	\$99,035.40	-0.96%
2-Jul	\$81,032	\$17,879.40	\$98,911.40	-1.09%
3-Jul	\$81,032	\$17,879.40	\$98,911.40	-1.09%
4-Jul	\$81,032	\$17,879.40	\$98,911.40	-1.09%
5-Jul	\$81,032	\$17,879.40	\$98,911.40	-1.09%
6-Jul	\$81,152	\$17,879.40	\$99,031.40	-0.97%
7-Jul	\$83,114	\$17,879.40	\$100,993.40	0.99%
8-Jul	\$83,958.20	\$17,879.40	\$101,837.60	1.84%
9-Jul	\$84,521.80	\$17,879.40	\$102,401.20	2.40%
10-Jul	\$84,521.80	\$17,879.40	\$102,401.20	2.40%
11-Jul	\$84,521.80	\$17,879.40	\$102,401.20	2.40%
12-Jul	\$83,958	\$17,879.40	\$101,837.60	1.67%
13-Jul	\$84,362	\$17,879.40	\$102,241.20	2.24%
14-Jul	\$84,474	\$17,879.40	\$102,353.40	2.35%
15-Jul	\$83,803	\$17,879.40	\$101,682.40	1.68%
16-Jul	\$81,702	\$17,879.40	\$81,702.00	-0.42%

Figure 24 – Small Growth Portfolio

#### 4.4.2 WINA – Winmark Corp.

Index Membership: N/A

Sector: Services

Industry: Business Services

WINA franchises retail stores that buy, sell and trade merchandise in the US and Canada. Retail stores include sports equipment stores, children’s clothing and toys stores, music-related stores and more. The company was founded in 1988 and is based in Minneapolis, Minnesota.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Following simulation onset, share prices showed an immediate increase and then stabilized. The beginning of July showed a sharp drop in share prices which recovered several days later, and was again stable.



Figure 25 – WINA stock price trend

#### 4.4.3 LZR – Emergent Group, Inc.

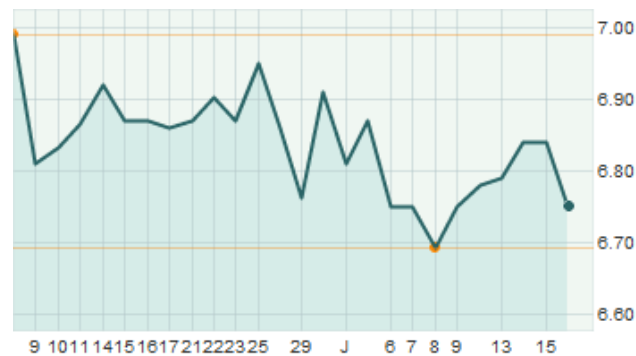
Index Membership: N/A

Sector: Healthcare

Industry: Medical Appliances and Equipment

LZR provides surgical equipment, surgical care centers and other health care services to the US. LZR services are provided on a per-procedure basis. LZR provides various medical equipments and disposable products to the medical personnel. The company was founded in 1964 and is based in Sun Valley, California.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). LZR share prices were highly volatile, but showed a general downward trend.



The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Share prices soared a week after simulation onset and rapidly declined in the end of June. The simulation low was on July 6<sup>th</sup> and the share price never fully recovered.



Figure 27 – PPD stock price trend

#### 4.4.5 FHCO – Female Health Company

Index Membership: N/A

Sector: Consumer Goods

Industry: Personal Products

FHCO manufactures, markets and sells the female condom, to prevent pregnancy and transmission of STDs. The company sells products to health clinics and non-profit organizations. The company was founded in 1896 and is based in Chicago, Illinois.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Share prices were relatively stable for the first week and then soared to a simulation high within a couple days, only to sink to the simulation low about a week later (beginning of July). The share price showed a rapid recovery but declined to almost as rapidly to as low of a value.



Figure 28 – FHCO stock price trend

#### 4.4.6 ATHN – Athenahealth, Inc.

Index Membership: N/A

Sector: Services

Industry: Business Services

ATHN offers online business services for physician practices in the US. Services include a revenue cycle management for managing billing-related functions, assisting of physician orders, automated messaging services to remind patients of appointments, and a program for visualizing business performance. The company was founded in 1997 and is based in Watertown, Massachusetts.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Share prices showed small fluctuation after the onset of the simulation, and grew rapidly at the end of June, only to see a small dip in share prices in the first week of July. Share prices began to further decline at the offset of the simulation.





Figure 29 – ATHN stock price trend

#### 4.4.7 NRT – North European Oil Royalty Trust

Index Membership: N/A

Sector: Financial

Industry: Diversified Investments

NRT holds rights covering gas and oil production in certain parts of the Federal Republic of Germany. The rights are held under contracts with German exploration and development subsidiaries. Rights for sales include gas well gas, oil well gas, crude oil, distillate, and sulfur. The company was founded in 1975 and is based in Red Bank, New Jersey.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). NRT share prices showed about a 3% fluctuation day to day in the first weeks of simulation with a general trend of lowered share prices. The share price low during the simulation was on July 13<sup>th</sup>

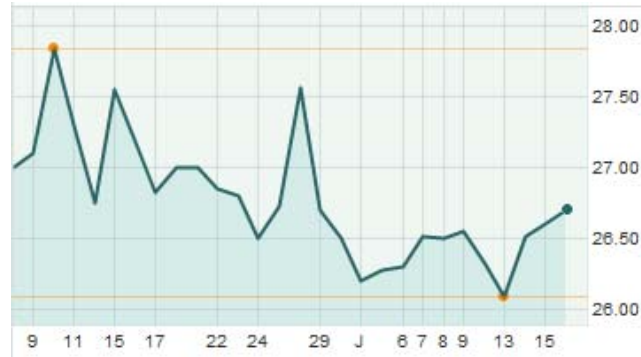


Figure 30 – NRT stock price trend

#### 4.4.8 APEI – American Public Education, Inc.

Index Membership: S&P 600 SmallCap, S&P 1500 Super Comp

Sector: Services

Industry: Business Services

APEI provides online post-secondary education to military and public service communities through two universities, American Military University and American Public University. 76 degree and 51 certificate programs are offered in various fields. The company was founded in 1991 and is based in Charles Town, West Virginia.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). The share price saw a short rise in value following simulation onset, but near the end of June prices began to drop, reaching an all time low in the beginning of July. The share price recovered some, but nothing noteworthy by simulation end.



Figure 31 – APEI stock price trend

#### 4.4.9 STAN – Standard Parking Corp.

Index Membership: N/A

Sector: Services

Industry: Business Services

STAN provide parking facility management services to the US and Canada, including on-site parking and ground transportation services. The company also maintains the parking facilities (restriping lines, refill ticket dispensing machines, parking gate arm maintenance, etc.). The company also collects from street side parking meters and other parking enforcement services for cities. The company was founded in 1929 and is based in Chicago, Illinois.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). STAN grew shortly after simulation onset and reached a high in the last week of June, but saw a sharp decline by month’s end. Share price began recovering in early July, and reached another peak on July 13<sup>th</sup>. Share prices dropped considerably a couple days before simulation end.



Figure 32 – STAN stock price trend

#### 4.4.10 MVO

Index Membership: N/A

Sector: Basic Materials

Industry: Oil and Gas Drilling and Exploration

MVO owns interest in the net profits of MV Partners, LLC in oil and natural gas properties, located in Kansas and Colorado. The company has about 1000 oil and gas producing wells. MVO was founded in 2006 and is based in Austin, Texas.

The following graph shows the share price (vertical axis) versus the day of simulation (horizontal axis). Share prices rised in the beginning of simulation and dropped to a low in the beginning of July. However, share prices quickly recovered and reached a high on July 12<sup>th</sup>. In the last week of simulation the share prices dropped again.



Figure 33 – MVO stock price trend

## Chapter 5 – Analysis

In this project, companies were categorized as large or small and by whether they are considered a growth or value stock for inter-portfolio comparison and comparison with the DJIA (Dow Jones Industrial Average). The majority of stocks showed stock price fluctuation trends that were similar in shape; characterized by an initial rise in stock value that dropped off in late June/early July and regaining value after the first week of July. The simulations were ended during a drop in value. The DJIA closing value chart is shown below.



Figure 34 – DJIA value trend

All of the portfolios saw similar trends to the DJIA in regards to the timing of peaks and valleys. The DJIA saw a 2% (9,899.75 to 10097.90) growth that was unmatched by any of the portfolios. In fact, only one portfolio was profitable amongst the four simulations, large value, and earned a meager 0.26% return. Large growth and small growth stocks showed losses of under 1%, however small value showed a loss of almost 2.5%. The following chart is a comparison of the four portfolios with the date on the horizontal axis and the percent change in equity on the vertical axis. The red plot represents the small growth portfolio. The blue plot represents the large growth portfolio. The green plot represents the large value portfolio. The

purple plot represents the small value portfolio. This graph extends over a short-period of time relative to many investment strategies, but displays the results that small value stocks are more volatile than growth or large company stocks. It is interesting how all of these plots have almost identical valleys, plateaus, and peaks, although with a portfolio deviating from the norm from time to time. It appears from the graph that both types of growth stocks are strongly related in terms of market trends, but small growth stocks (blue) take larger losses than the large growth stocks. The recovery made appeared to be relatively equal.

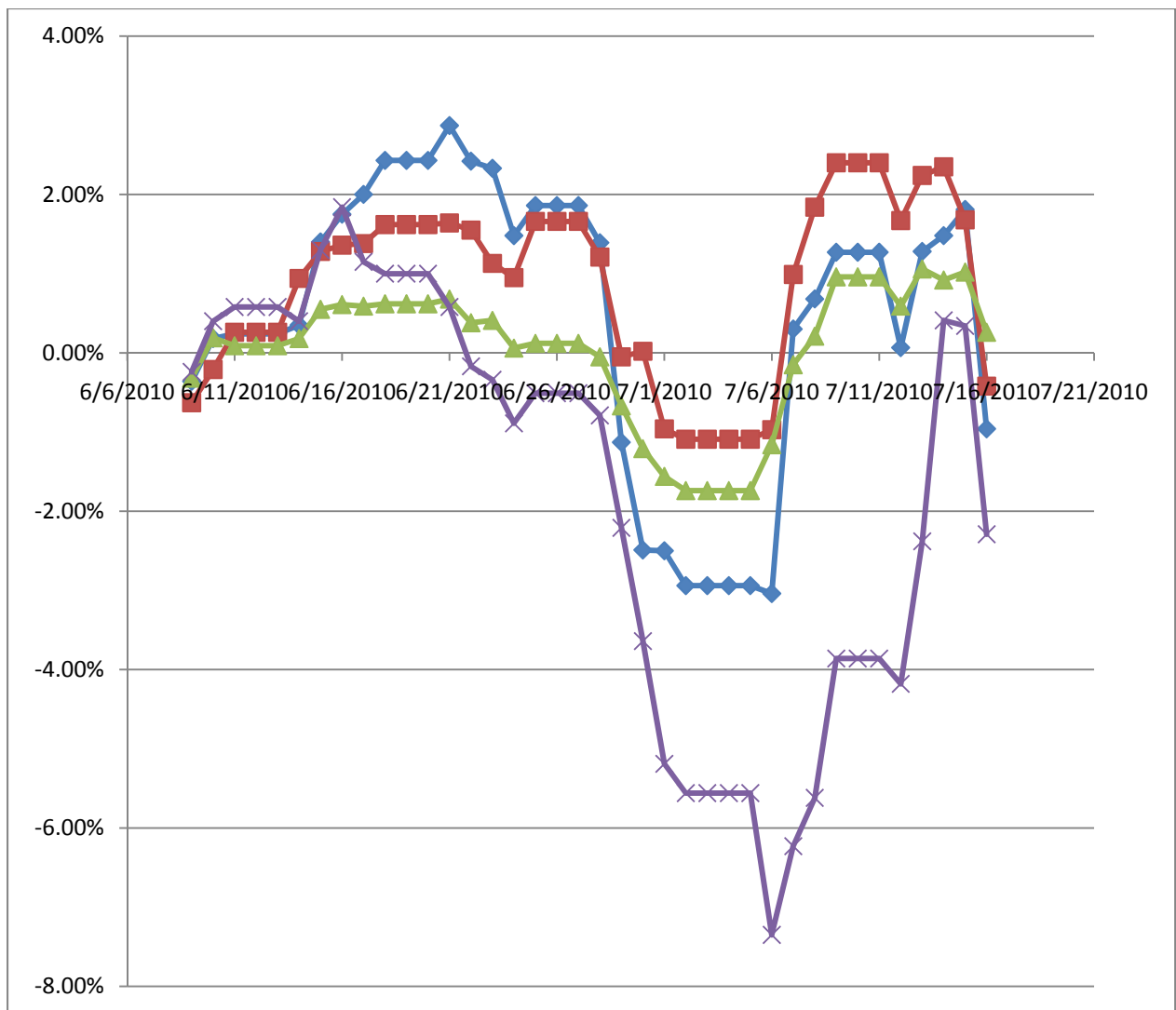


Figure 35 – % Return of the four Portfolios

Of the individual stocks evaluated, a few showed a stock value trends that deviated from the trends of the DJIA. The most prominent of these were WTSLA, NRT, APEI, ATHN, WINA, MVO and NVO. WTSLA, NRT, and APEI all showed general downward trends and lost approximately 17%, 2%, and 6% respectively. NVO showed a general upward trend, earning 11.5%. WINA demonstrated fairly stable stock prices, but had a one week period in which the stock value plummeted 10% and immediately returned value. MVO showed high volatility, losing 10% of its value at one point, but ending with less than a 3% loss. The most interesting was ATHN, which actually showed a trend that appeared to be inversely related to the trend seen by DJIA. Also, some stocks showed the same trends, but with some deviation in the associated date of the value changes, these include XIN, BZH, FHCO, and BMY. NVO was clearly the most profitable stock, and only 3 other stocks profited to amounts comparable with the DJIA, these were STAN (2.5%), RTP (1.7%), and WINA (3%). FUQI, BZH, WTSLA, and SWN were the stocks that took the biggest losses, ~10%, ~17%, ~17%, ~10% respectively. Five other stocks saw losses between 5 and 10%, and the rest had losses less 5% or gave minimal returns back.

The volatility that is still seen in the market is believed to be associated with super computers that attempt to make huge profits on mere penny swings in the value of stocks by purchasing such high quantities. Laws are currently being made to limit the ability of brokers to take advantage of such small swings.

## Chapter 6 – Conclusions

Investing is an important part of the economy. The stock market allows the individual to invest in companies via stocks and has been a part of the U.S. economy since 1792, with the NYSE. There are many available stocks for purchase and the prices vary with company size and revenue, as well as current events. When the economy is declining stock prices also decline, as investors tend to sell to meet their own monetary needs. Economists measure the economy using a calculated GDP value, which reflects the country's exchange of goods and services.

The end goal of investing is to turn a profit, however when investing in the stock market this is clearly not always possible. This project shows how hard it can be to select stocks that return a profit, let alone beat the market. This is why having a diverse selection of stocks is important and why mutual funds are used. With mutual funds only one commission is paid, rather than paying commission on each stock purchased.

In addition to paying commissions on purchases, an investor will have to pay income taxes on profits through the sale of stocks (trades are considered selling and then buying) for each year. An interview with a CPA revealed some interesting ways to save money on these taxes as well. If total sales in a year are made at a loss, up to \$3,000 can be deducted from other income that is generated before taxes are applied (which could put an investor in a lower tax bracket). Also, if some stocks are sold at a loss and others are sold at a profit, then net profit is the amount that is taxed, but only if the stocks which are sold at a loss aren't repurchased within 45 days. Currently there is a 15% federal income tax, but this will be increased to almost 40% by next year, which could cause more people to be selling, and thus creating a somewhat bearish market, although this will probably be seen more prominently later in the year. In addition to a



federal income tax, states may also mandate additional income taxes ranging from 0% to 10%, and New York City requires an additional income tax on top of both the state and federal taxes.

a 15% federal

Looking back on the fluctuations in stock value, one could say that if stocks were purchased at the right moment when prices were low and then sold when they were high then almost any stock could be profitable. However, it is hard to predict whether the stock value will increase or decrease in the next given moment. By employing a dollar cost averaging strategy the investor can take away some risk associated with the timing of purchasing stocks.

Furthermore, the psychology of an investor can be very important. Some investors tend to sell when a stock starts to drop in value and buy when it starts to raise in value, which somewhat goes against the buy low and sell high theory. However, some stocks that are priced low or that are dropping in value shouldn't be purchased because they could continue to decline. In addition, sometimes when a stock is dropping in value it is better for the investor to take the initial loss than to risk a further decline in value. Plus, as found from meeting with the CPA, this loss can be deducted from earnings and which would further reduce the potential loss.

It may be more advantageous for an investor to invest in companies, sectors and/or industries that he/she is familiar with. This may enable an investor to have a better idea of how media releases and current events may affect the value, which he/she could then take advantage of.

In conclusion, when making investment decision regarding the stock market, the investor should be wary of the risks and spread the investment between many stocks or mutual funds. It is a good idea for an investor to choose stocks that are both low risk and high risk, as this may generate greater overall revenue in the long run. However, it is important for the investor to time

their entering into the stock market, in order to avoid poor market timing and purchases made when the stocks are at an above average value. The investor should make a plan regarding how he/she will act under certain circumstances in order to prevent irrational behavioral choices when stock prices take an unexpected turn. This project finds that the risk associated with small value stocks is the highest and that large growth is the least risky, in terms of likelihood to lose money. Large value stocks are slightly more risk than the large growth companies but are less risky than the small growth companies. In all, with greater risk comes a greater chance to profit.

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