Stock Market Simulation An Interactive Qualifying Project Report: Submitted to the faculty of the Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor of Science

by

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Abstract

Beginning with an introduction to the stock market and its history, I conducted a six week trading simulation using resources available online. I analyzed several strategies and chose two for the purposes of my simulations. Through my practice and analysis, this project will serve as a learning tool and will supply valuable experience for future investment.

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1. Introduction

My objectives in pursuing this IQP are to gain a better understanding of the stock market through trading simulation and available online resources. Several investment methods will be analyzed and a few will be selected to experiment with during my simulation. I will follow established investment strategies that I feel will net the best profit in a six week simulation. My overall goal is to gain a 10% profit through each of the strategies that I choose to use. I will invest in each strategy an amount of \$100,000 and play out the strategy for the duration of the simulation.

Any investment strategy involves thorough company research and close attention paid to stock price trends and general market conditions. Analysis of several companies' financial standings and likely paths for the simulation will also be found in this project. Following my simulation, I will analyze the investment strategies and their relative strengths and weaknesses in my particular situation. Finally, I will conclude the project with a final analysis of what I have learned including the value of the learning experience and my perspective on how the project will prove worthwhile in my future.

2. The Stock Market

2.1. History of the Stock Market

In order to understand the stock market, one first needs to comprehend the definition and meaning of the word *stock*. A *stock* is "A type of security that signifies ownership in a corporation and represents a claim on part of the corporation's assets and earnings" [1]. In more literal terms, an investor buys a small bit or several small bits of a company and then can directly benefit from any successes or losses that the company may endure. Put simply, a stockholder can become wealthy if invested in a company that succeeds or can lose tragically if a company begins to slide.

The origins of the stock market can be traced all the way back to twelfth century France where the first brokers traded with agricultural debts. The idea soon spread around thirteenth century France and eventually to Amsterdam and Venice where brokers traded with government securities. The first stock exchange, in the strictest sense, can be considered to be the Amsterdam Beurs, where continuous trading started during the seventeenth century and where practices such as short selling were born [2].

The modern stock market can be traced to Philadelphia in 1790, although many people tend to wrongfully assume New York City to be the modern birthplace. The New York Stock Exchange (NYSE) was established in 1792 on Wall Street. From its humble beginnings as an exchange between 24 New York merchants, the NYSE has grown to become a powerful force, a connection to

worldwide money markets, and the home of \$2.2 trillion in transactions per day [3].

2.2. The Intricacies of the Stock Market

The stock market is not the grand mystery that most people believe it to be. One does not need an intense education or a vast knowledge of financial jargon to be successful in investing. With careful consideration and smart decisions, an average person can become quite wealthy over a period of time.

The most basic tenet behind all dealings with the stock market is to buy low and sell high. The price of stock in every company fluctuates daily and when an investor buys stock at a low price and sells it at a high price, a profit can be made.

Predicting trends is the most valued skill when it comes to investment. It takes a substantial amount of time to research and predict the trends of a stock and invest accordingly. Even with careful observation, prediction is not an exact science and is the major cause of the risks involved in investing. A person can individually decide to invest based entirely on their own research and intuition and, often, this can be profitable. For those that are less than confident in their own ability to predict trends and read into the market's signals, there are companies that specialize in just that. Stock brokerages provide advice and other assistance to those willing to pay for their services. Financial advisors are especially handy to an investor that does not have the time to pay close attention to the market but still wishes to take advantage of its potential for profit.

The purchase of stock can be accomplished in a variety of ways. One can do their own purchasing through websites and, most likely, a completely computerized process. One can also purchase stock through a brokerage house, which provides more human interaction and is probably safer for unsure investors. Both choices have their advantages and drawbacks depending on what the investor is looking for. While an online trader probably has more direct control over his/her portfolio, those investors that go through brokerage houses can feel assured that they have knowledgeable and reliable support. No matter how one chooses to invest, unless they plan on actually trading in person on the stock exchange floor, they will need to go through some sort of broker and they will need to pay the broker a commission. Most often, the commission is a percentage of the investment or it could be a flat per-trade rate in the range from \$5 to \$100 or more.

Playing the stock market is, as is anything concerning the manipulation of money, a risk. An investment is never guaranteed a successful return and even a profit can easily be lost in the blink-of-an-eye. The stock market can be cruel and it can be quite generous. Almost like someone playing the lottery, an investor needs to accept the fact that they may not come away with millions. Unlike the lottery, however, a careful investor has control over their investment and with patience, perseverance and a little bit of luck, can come away with substantial gains and a feeling of accomplishment. The stock market is a learning experience, and as such, investors need to know there is always the possibility of failure and the possibility of great success.

3. Stock Market Analysis Strategies

There are many theories for how the stock market behaves and for the best way to analyze the behavior of the market at particular times. There are two major schools of thought and there is also a third that contradicts both of the first two and charts its own path. These three schools of thought are technical analysis, fundamental analysis and random walk theory.

3.1. Technical Analysis and Dow Theory

Technical analysis is, put simply, an analysis of the stock market based on charts and past prices. Modern technical analysis is based largely on the writings of Charles Dow and the Dow Theory that came together from several of his articles in the Wall Street Journal. Dow's analysis came from the late nineteenth century and it only became known as a unified "Dow Theory" in books by William Hamilton in the early twentieth century. Robert Rhea further revised the theory in later books and put forth the Dow Theory as a logical set of "assumptions and theorems" [4].

The Dow Theory is a highly technical set of guidelines founded on several assumptions. Dow believed that market activity could be broken into three types of price trends. He named these three movements as primary movements, secondary movements and daily fluctuations. By Dow's standards, primary movements are those that "last from a few months to many years and represent the broad underlying trend of the market" [4]. Secondary movements do not last

as long, usually weeks or months, and tend to move "counter to the primary trend". Daily fluctuations do not last more than a week and are the immediate consequences of daily trading [4].

Dow Theory, though it incorporates analysis of several key market indicators, is largely concerned with identifying the primary trend. Dow and Hamilton sought to catch large trends and follow them for success. One of the most important assumptions in the Dow Theory is that "the trend is in place until proved otherwise" [4]. This all-important assumption serves as a sort of cautionary measure to warn investors of the dangers of emotion. To avoid making costly moves, an investor needs to remember that the primary trend is still alive until it is proved, through the theory's practice, that it has died [4].

Technical analysis is very closely tied with a type of market efficiency called "strong-form". With a "strong efficient" market, it is said that the current price is a strong indicator of all available information about a given stock. This means that any information, from public knowledge to the internal information that the company itself possesses, ultimately affects the price and is reflected in the stock price at any given moment [5]. For technical analysis, this assumption is very important. Technical analysts rely heavily on current prices to make their analyses and they need to believe that the current price is a valid "fair price" and is a result of every possible influence.

Technicians make their analyses based almost entirely on charts of stocks' prices. The main concern of technical analysts is the current state of the price and the history of the performance of the stock. Technical analysts believe

that trends exist in the movements of the market and they identify trends through the price charts that they are known to love. Technical analysts are criticized for identifying trends too late and acting on them after much of the action has already occurred. Still, there are those that choose the technician's view on the importance of price and price movements over the views of the other forms of market analysis [6].

3.2. Fundamental Analysis

Fundamental analysis is quite a different breed of market analysis. While technical analysts are consumed with price charts, fundamental analysts tend to pay more attention to other factors. Where technicians believe that the current price is a result of all available information, fundamentalists believe no such thing. Fundamentalists believe that the price is not based on any readily available information and instead think that it is only based on past prices. Thus, fundamentalists believe that the market's efficiency is weak [5].

Fundamentalists look at very long term trends. Patience is a necessary trait for every fundamental analyst. Fundamentalists group companies together into "industry groups" of some related nature. Fundamentalists believe that the stocks of companies that are closely related will move together. With this strategy, fundamentalists then have to look at specific companies within the industry groups to determine their actual investments [7].

Fundamental analysis is very time-consuming. Fundamentalists conduct thorough and extensive research for each aspect of an investment. From the entire market, to the several industry groups, down to the individual companies, fundamentalists scrutinize every single detail in order to gain the best understanding available. Although incredibly time-consuming, the fundamentalists' intense work ethic, makes them, as they would have it, the most knowledgeable and most qualified analysts among their peers.

The advanced nature of fundamental analysis often makes the method an unlikely tool for beginning investors. Industry groups and the companies they contain differ widely from their counterparts in the rest of the market. Fundamentalists need to treat each industry group differently and address the finer nuances that each possesses. Fundamentalists must use different techniques for each group and company that they invest with. Based on models that they produce using their research, fundamentalists use their techniques to produce the results they are looking for and, ultimately, gain a profit.

Just as with any other market analysis strategy, fundamental analysis has its relative weaknesses. As has previously been contended, fundamental analysis is a very time-consuming process and requires the utmost diligence. The extensive research and dedication to the practice is met with no guarantee of a profit. Though not only true for fundamental analysis, the personal bias and viewpoint of any analyst will show through in his or her results. Shortsightedness, on the part of the investor, can prevent him/her from making the best and most profitable decision. Caution is a necessary virtue that cannot be ignored when involved with such high-stakes dealings. Fundamental analysis is probably not for anyone looking to make a quick plunge into the market for a

profit; rather, fundamental analysis appeals mainly to those seeking long-term and sound investments [7].

3.3. Random Walk Theory

Random Walk Theory is not, in reality, a market analysis strategy; in fact, it is a theory based on the belief that market analysis is futile. Put forth in a 1973 book by Burton Malkiel entitled *A Random Walk Down Wall Street*, random walk theory rests on the sole premise that market movements are entirely random and that trying to predict them is entirely a waste of time. For a stock market system that is largely based on analysis and measured decisions, random walk theory poses a threat to most established beliefs about the stock market [8].

Random walk theory best allies itself with the semi-strong form of market efficiency. A semi-strong market reacts instantaneously to any news or information concerning the market. Market movements, then, appear random and render any attempt to use new knowledge to gain an advantage in the market virtually impossible [5]. Random walk theory contends that buy-and-hold investments are the only useful investments and that trying to play the market based on predictions and timing is an entirely useless exercise [8].

As it turns out, random walk theory is, in fact, looked upon with a sort of disdain in the Wall Street community. Attempting to debunk the established beliefs of market analysis and prediction can be a daunting task. Statistically, Dow Theory outperforms the buy-and-hold practice by 2% each year, as concluded in 1998 by Stephen Brown, Alok Kumar and William Goetzmann in the

Journal of Finance [8]. While never a certainty, the two practices of market analysis are used often and frequently produce results. Random walk theory "appears to be a bit dated and does not accurately reflect the current investment climate" [8]. Random walk theory may prove to be viable and useful in practice, but for investors who wish to retain a feeling of control over their investments, one of the strategies of actual market analysis is probably a better fit.

4. Stock Market Investment Methods

4.1. Long-Term Investment

Of the different stock market investment strategies, long-term investment is probably the least complex. To invest using the long-term strategy, one usually does extensive research on one or more companies in which they want to invest. The goal of long-term investment is simple: find a company worth investing in that you believe will steadily produce a profit over several months or years time. This can be done by investing in a fairly infantile company that is destined to have a bright future or can be done by investing in companies that specialize in seasonal goods, for example, bathing suits or snow shovels. The most basic attraction to long-term investment is that it does not require significant attention. One who invests for the long-term is not interested in the current state of the market or its projected path for the next few weeks; anyone investing for the long-term is looking for the overall trend of the stock for the entire period of investment. Saying that long-term investment requires minimal involvement does not mean that there are not significant risks. Long-term investment can still be a shaky endeavor and often investors can start to lose money rather quickly. Long-term investment is always a gamble and, in reality, the only way to profit is to do in-depth research on the company or companies and to accept that despite dips in the price, hopefully, the stock's overall performance will net a gain in the end.

4.2. Penny-Stock Trading

Penny-stock trading is one of the riskier methods of trading on the stock market, though, as is usually the case, with higher risk comes greater reward. A penny-stock is a stock whose price is usually under \$1 per share but can be up to around \$3 per share. In order to invest in penny-stocks, one must pay a lot of attention to their investments. Unlike long-term investment, penny-stock trading has more of an emphasis on trading and daily upkeep. Because of the inherent risks and low popularity of penny-stocks, the large stock exchanges do not deal with these low-priced shares and a penny-stock investment is usually done overthe-counter and through a broker that specializes in such dealings. The basic tenets behind penny-stock trading are the same, albeit far more difficult to achieve, as for any stock market investment: buy low and sell high. With pennystocks at such low prices and the potential for great monetary gains, usually an investor puts a lot of money in and buys many shares. Although buying many shares guarantees an investor a substantial profit when the stock price rises, it also ensures that the investor bears the heavy burden of any losses the company may suffer [9].

4.3. Day-Trading

Day-trading is possibly the most hectic, complex and intensive of all investment methods. It is the riskiest investment strategy and, as such, has the greatest possibility for success (and loss). Day-trading requires an investor to pay attention to their stock at least every day and almost certainly many times per day. In fact, the most successful day-traders probably sit in front of their computers all day looking at the price fluctuations. Day-trading is very demanding. A day-trader literally holds on to shares for hours, minutes or even seconds. Some day-traders don't even hold on to their shares overnight for fear of the dramatic price shifts that circumstances beyond their control can cause [10]. The reasoning behind day-trading is that by trading the shares in such a short time after buying, a day-trader can produce results, for better or for worse, very quickly and actually within the day. Day-traders ride trends. Their practice is to buy shares in a stock that appears to be on an upward trend at that moment, reap the benefits of the short upswing, and sell the shares before the inevitable downward fluctuation comes. Day-traders probably repeat this process dozens of times a day and they count more on luck than a user of any other strategy. Even if one is able to manage the intense preparation, the psychological strain of high-risk trading and the inherent volatility that comes with the practice, a daytrader is not guaranteed a profit, by any means, and fortunes can be easily lost by the faint-of-heart.

4.4. Swing Trading

In the same vein as the adrenaline-pumping day-trading strategy, swing trading is a similar practice, but it is much milder. In fact, swing trading is quite user-friendly and is a good starting point for investment beginners. With this strategy, investors hold their shares for days, a much more reasonable period of time. Swing traders also look to pounce on trends but they do so in regards to an

upper and lower *baseline* value. It is within this window or channel that the swing trader thrives. Establishing the baselines is critical, but once they are set up, the swing trader has everything he needs to play the market. When a stock price reaches a lower baseline, the swing trader acts; but not right at that moment. The swing trader waits just a little longer to see if the price is following in the projected window and then buys shares. If all follows according to plan and the price rises to near the upper baseline, the swing trader sells the shares to profit. The swing trader pays close attention to the market and sells when it is the best choice, but not necessarily the most profitable. The swing trader takes into account the current market conditions and may, in fact, sell the shares before or after the most profitable point. Swing traders don't make single trades for gigantic profits; swing traders make profits through careful, measured trades that, when properly executed, can lead to pretty significant gains. All in all, swing trading is a sound, lower-risk investment strategy that can appeal to even the most skeptical potential investor [11].

4.5. Methods Selected

As stated at the onset, my goals for this project were to take two investment strategies and try to make a 10% profit from each of them after investing an initial \$100,000. Of the investment methods I listed, I found two to be quite feasible for my simulation. A long-term investment for 6 weeks seemed unlikely to be profitable for such a short term. Day-trading seemed to be for those with superior skills and a good deal of confidence; both of which, I do not have. Penny-stock trading, although very risky, seemed to be a good candidate for a simulation. It is not as overly complicated or exhaustive as day-trading and 6 weeks provides sufficient time to get some results, for better or for worse. Swing trading, since it appears to be ideal for beginners, seemed like a perfect candidate for a simulation conducted by a beginner. So, penny-stock trading and swing trading were selected as the two trading methods for this project.

5. Company Research

-Sunnylife Global Inc. (SNYL.PK)



Figure 1: Year-To-Date Price Chart (SNYL.PK)

Sunnylife Global Inc. (SNYL.PK) is a U.S. based company that specializes in bringing better health care and better facilities to countries with inadequate systems. Working mostly in China, Sunnylife Global became "the first company in over 100 years to sign a hospital joint venture agreement with China's central government" [12]. Their goal is to renovate China's less than satisfactory hospitals and ensure better care for Chinese citizens and world travelers alike. I became interested in this company after hearing about their hospital plans and their research into environmentally safe medications and their integration into current systems [12].

I first considered investing in the company after observing their financial progress for 2006. A couple of very strong peaks piqued my interest. Although it

is never a guarantee, I felt that I wanted to take a chance and invest in the company and take advantage of its next large peak. The company's enthusiasm in its own work, outlook for future growth, environment-friendly designs and low stock price made Sunnylife an interesting choice for a penny-stock investment.



-Earthblock Technologies (EBLC.OB)

Figure 2: Year-To-Date Price Chart (EBLC.OB)

Earthblock Technologies (EBLC.OB) is the most interesting company that I've invested in. The company specializes in making building blocks for homes and small structures out of the soil surrounding the building site. Built on a foundation identical to most houses, a house made out of the company's compressed earth blocks (CEBs) is much more environmentally friendly and cuts down on costs inherent with home-building.

In Earthblock Technologies' 2006 financial history, I noticed an astonishing peak toward the end of April. The company's stock rocketed to close

to three times its current price. I believe the price jump was associated with hype and publicity generated around that time by the company itself in order to gain more investments. I consider this stock to be very dangerous but I chose to invest in it because I was interested in what consequences could pan out and I feel it would be worthwhile for future knowledge to analyze investment in such a risky stock. The combination of the intriguing technology, the very low stock price and the potential for huge gains (or losses) made Earthblock an especially appealing company for investment [13].



-Nord Oil International Inc. (NDOL.PK)

Figure 3: Year-To-Date Price Chart (NDOL.PK

Nord Oil International Inc. (NDOL.PK) has made huge gains during the course of 2006. A skyrocketing price jump back in May made some investors huge sums of money but the company is, by no means, a safe investment. The company trades publicly through over-the-counter transactions and the public

company is the head of three Russian subsidiaries. Specializing in Russian oil production, the company relies heavily on export to other countries and the chance of finding new oil sources in Russian territory [14].

The recent rise in May of Nord Oil's stock price can likely be attributed to a mass-emailing scheme that occurred around the time of the climb. As is often the case, information disseminated over the internet can drastically pump up a stock's price even if the information is not trustworthy. With Nord Oil, false "stock-tips" were sent through e-mail and posted all over legitimate-looking websites around April 2006. The information resulted in a skyrocketing price in May and when the information didn't pan out, the price dropped again.

For my simulation, the fraudulent information of April 2006 will have no effect on how I conduct my operations. Since my trading concerns short bursts of activity and capitalizing on small price changes, the anomaly in May can be ignored. I felt it would be interesting to invest in a company that many could be falsely lured to but I, essentially, chose Nord Oil for investment because of its potential for many short dips and peaks. As a penny-stock, its behavior should play out well for my trading purposes.

-Johnson and Johnson (JNJ)



Figure 4: Year-To-Date Price Chart (JNJ)

Johnson and Johnson (JNJ) is a very large company that specializes in many products that people use everyday in the home. Though primarily operating in the U.S., Johnson and Johnson has worldwide dealings in 57 countries and on at least 4 continents. Comprised of over 200 separate operating companies and with an employee force of nearly 116,000, Johnson and Johnson is responsible for most major health care products from baby care products to pain relievers and other medications.

From the 2006 financial history of Johnson and Johnson, I felt that the company was a very stable investment. There is potential in that the company fluctuated greatly over a period of almost six months but it did so in a relatively slow fashion, so that it would be more suited for a swing trading exercise. In existence for over a century and with low-volatility stock price fluctuations,

Johnson and Johnson appeared to be a good candidate for a smart investment [15].



-Kraft Foods Inc. (KFT)

Figure 5: Year-To-Date Price Chart (KFT)

Kraft Foods Inc. (KFT) and its subsidiaries manufacture many food products from cheeses to beverages as well as many other packaged foods and snacks. Kraft operates in 71 countries and sells its products to citizens of over 150 countries [16].

Kraft Foods' price has been steadily climbing for the past few months with only brief dips into lower prices. Overall, the stock has been holding to its norm of the past couple years. From looking at the 2006 data, it appears that Kraft has plenty of fluctuations I can exploit and it looks steady enough to try swing trading. With the stability of an established company and a low-risk stock price progression, Kraft Foods Inc makes a good candidate for a swing trading simulation.

6. Simulation

I started a six-week simulation during the week of June 5, 2006. I split my simulation into two divisions: one for investing in penny-stocks and one for a swing trading simulation. For each division, I have allotted \$100,000 of initial investment money to use. All price charts used from herein are courtesy of Reuters and their customizable price-charting tools [17]. For the simulation, I have chosen to run all trades through an imaginary broker that charges a \$7 commission for each trade.

6.1. Penny-stocks

My first investment for the penny-stock portion of my simulation came on June 7. I found a company that caught my interest and decided to invest \$50,000 into it. I chose to invest only \$50,000 of the \$100,000 that I allotted to my penny-stock simulation because I was cautious and I didn't want to be too rash with any investment decision. I invested the aforementioned \$50,000 in a company called Sunnylife Global Inc. (SNYL.PK). On June 7, the price seemed to be following a trend quite conducive to penny-stock investing. On the previous days, the stock price for Sunnylife rose and dipped to sharp peaks each day. I chose to try to take advantage of this behavior and invested at what appeared to be a sharp dip in the stock price. After making sure that the stock rose a bit after the sharp dip, I invested my \$50,000 at a price of \$1.16 per share. I watched the price rise and saw that it continued on its small upward trend. At the end of

trading on June 7, I sold my shares in Sunnylife because I still felt cautious and so that I would not fall victim to any unforeseeable activity overnight. I sold my shares at \$1.20 per share and collected my profit. For the rest of the week, I followed basically the same method; I invested after I saw a dip and the beginning of a rise and sold my shares after seeing a peak and the very start of the decline. I saw a drop to \$1.15 on June 8 and invested again at \$1.16. This time I kept my shares overnight and took my chances with any overnight changes. There were no drastic changes overnight and I ended up being able to sell my shares on June 9 for \$1.24 per share.

After June 9, I watched the stock price closely for a few days. I wanted to be sure that the stock followed the behavior that I believed to be its norm. For the days that I watched the stock, its behavior was confirmed in my mind; the stock price rose sharply and dropped repeatedly over the course of my observation. On June 13, I saw the price of SNYL.PK stock drop to around \$1.11. \$1.11 was the lowest price I had seen in all my observation so I decided to invest after seeing a little rise. The stock rose slightly on the next day, I invested at \$1.12 and watched the stock continue on an upward trend. I sold those shares, numbering 49340 at this point, after the small trend that I was watching appeared to begin its descent. Two days later, on June 16, I witnessed the price drop to under \$1.12 again and decided to reinvest when the price rose again to \$1.12. I purchased 52411 shares for a price of \$58,700.32 and waited for a chance to sell. Activity for SNYL.PK for the first two weeks of my simulation can be seen in the chart on the following page:



Figure 6: SNYL.PK Bi-Weekly Price Chart (June 5 through June 16)

For the third week of my simulation, I decided to invest the remaining \$50,000 that I set aside for penny stocks. After watching its progress for the first two weeks of simulation, I felt comfortable enough to invest in Earthblock Technologies (EBLC.OB). Earthblock's activity during my two weeks of observation can be seen in the chart below:



Figure 7: EBLC.OB Bi-Weekly Price Chart (June 5 through June 16) 25

The chart on the previous page shows that the company had some great potential to gain an investor a profit. Peaks and troughs were clearly defined, I was able to easily determine the stock's next movements while watching it and the dips and crests seemed dramatic enough to be profitable.

I invested on June 19 at a price of \$0.04. With such an extremely low price, the potential for gaining money from my 1249676 shares was particularly high. As it turns out, for the week of June 19 through June 23, the stock showed little promise to net a profit. I missed one imperceptible selling opportunity early in the week and for the rest of that week the price stayed well below my buying price and ended the week at \$0.03. The chart below shows the small profit peak and the declining progress of EBLC.OB for the week of June 19 through June 23:



Figure 8: EBLC.OB Weekly Price Chart (June 19 through June 23)

For the same week, my experience with my SNYL.PK stock didn't turn out any better. After investing the previous week at a price of \$1.12, the price never rose above my buying price the entire week. After a few peaks at my buying price early in the week, the stock dropped substantially in the middle of the week and only recovered about halfway by Friday, June 23. There was absolutely no point during the week of June 19 through June 23 that proved of any worth to someone that had invested in the previous week. The sharp drop on Thursday, June 22 would have proved an ideal investment point had I not already currently been involved in the stock. The progress for SNYL.PK and its lack of profitable peaks for the week of June 19 through June 23 can be found in the following chart:



Figure 9: SNYL.PK Weekly Price Chart (June 19 through June 23)

For my fourth week of simulation, I was looking for opportunities to sell my shares. After such an unfortunate week, I decided I just wanted to sell my shares and take my chances with purchasing at a different price during the week. On Monday, June 26, I sold my shares of EBLC.OB at \$0.03 per share and an incredible loss of \$12,503.76. As it turns out, the stock made a slight rebound by the end of the day and going into Tuesday, June 27, the stock's price leveled off

at a nice peak of \$0.032 and had I waited a few hours to sell my shares, I would have suffered a loss of a slightly less damaging sum. Earthblock Technologies' stock price activity for the week of June 26 through June 30 is in the following chart:



Figure 10: EBLC.OB Weekly Price Chart (June 26 through June 30)

After such a disheartening loss with my shares in Earthblock, I was reluctant to sell my SNYL.PK shares so hastily. I, however, only waited until the next day, June 27, to sell off my plummeting Sunnylife shares. The activity of SNYL.PK during the period from June 26 into June 27 was remarkably similar to the activity of EBLC.OB during the same timeframe. At the end of trading on June 26, I saw the same "leveling off" behavior with SNYL.PK that I was witnessing with EBLC.OB. I sold my shares the next day, June 27, when the stock price dropped from the plateau. By selling my shares, I sustained another loss, this time for \$4,199.88. As it turns out, the loss I sustained by selling SNYL.PK shares at that moment was better than anything I could have hoped for

through the rest of the trading week. For the remainder of the week of June 26 through June 30, the stock price fell to near \$0.93 and rose above \$1.00 only 3 times. I took advantage of the lowest peak on June 28. I reinvested in SNYL.PK after a short rise to \$0.94 per share. At the end of trading on June 28, the stock had recovered to exactly \$1.00 per share but by the next time I checked the price, it had dropped to and leveled off at \$0.95 and had begun another climb. I watched this climb closely and when the stock price peaked at \$1.01, I sold my shares at \$1.00 on June 29. The following day, upon checking prices at midday, I came to the realization that a great investment opportunity had peaked and passed already during the morning hours. The price had again dropped to around \$0.94, rose to \$1.00 and dropped again to \$0.93. By checking prices at midday on June 30, I had missed one of the best opportunities of the week. Sunnylife's violent fluctuations for the week of June 26 through June 30 can be seen in the chart below:



Figure 11: SNYL.PK Weekly Price Chart (June 26 through June 30)

I used the money that I had salvaged from my Earthblock investment, totaling around \$37,000.00, to invest in another penny-stock, NDOL.PK. After watching Nord Oil's prices for the better part of a month, I felt that, with a little luck, it would help my wounded financial state recover. On June 27, I bought 124920 shares at a price of \$0.30 per share. On June 29, I sold my shares at a price of \$0.34 per share after seeing a great price jump up to near \$0.35 per share. As had been my wish, I had made back nearly \$5,000 of the more than \$12,000 I had lost from my EBLC.OB investment.

My fifth week of simulation saw very little in the way of activity. I paid most attention to investing in NDOL.PK. As for SNYL.PK, the week of July 3 through July 7 was somewhat uneventful. While tracking the prices during the week, I wasn't able to pick up on any strong trends happening with the stock. There were fluctuations but they were not as strong as I had previously witnessed and I seemed to be cursed with bad timing at any chances to invest. Somehow, whenever I checked prices for SNYL.PK, I found myself in a position where I had just missed a great opportunity and the time for action had already passed. SNYL.PK's progress for the week, though I made no investment is shown in the price chart on the following page:



Figure 12: SNYL.PK Weekly Price Chart (July 3 through July 7)

On July 5, I invested in NDOL.PK at a price of \$0.30 per share. I was still only working from the funds I had originally allotted to EBLC.OB and I saved the other funds for use with SNYL.PK. NDOL.PK's price had dropped considerably on July 3 and after staying basically stable into July 5, it continued to drop to under \$0.30. When the price rebounded up to \$0.30, I invested. For the better part of the next two days, the price remained around \$0.30 with price fluctuations that did not look promising. On July 7, however, the price rebounded quite a bit, and, not wanting to take any chances, I sold my shares as soon as the price reached a respectable \$0.32. The stock price dropped immediately after I sold my shares and jumped back up to near \$0.32 by the end of the day. I had gotten lucky with my decision to sell and a figure depicting NDOL.PK's movement for the week of July 3 through July 7 follows:



Figure 13: NDOL.PK Weekly Price Chart (July 3 through July 7)

For my final week of trading, I made just two trades. While checking prices for NDOL.PK, I didn't see many changes that warranted an investment. Now that I've had a look at the progress over the week as a whole, it appears that I could have had many chances for investment but, at the time, I saw very little to call for a trade. I made no investment in the company for the entire week:



Figure 14: NDOL.PK Weekly Price Chart (July 10 through July 14) 32

My trades for the week of July 10 through July 14 were all done through investment with SNYL.PK. On Monday, July 10, I invested in SNYL.PK a sum of \$51,622.74 for 66183 shares at \$0.78 per share. The stock price had made a plunge to near \$0.75 per share during the day on Monday and I invested after safely seeing that the price had turned around. By the end of the day the price had recovered to \$0.85 briefly and on the following day, Tuesday, July 11, I was able to sell my shares at \$0.83 per share and net a profit. During the course of trading on July 11, the price again dropped modestly to near \$0.78 per share. I invested again on July 11 at a price of \$0.80 per share. Since I had seen nothing worthwhile from NDOL.PK, I invested all the money I had to work with for this last trade. I invested \$106,534.40 and worked from there. The stock price then experienced a tumultuous day-and-a-half where the price shot between \$0.80 and \$0.83 repeatedly and even up to \$0.85. Had I been paying closer attention, I could have capitalized on the behavior during the period of July 11 through July 12 but I did not sell my shares until July 13. The price had curiously leveled off at near \$0.85, then, dropped to and leveled off at \$0.83. I sold my shares during this time at \$0.83 per share. For the rest of the week, the price rose to \$0.84 briefly and, in end-of-the-trading-week analysis, I realized I could have earned a larger profit; everything is clearer in hindsight. The activity of SNYL.PK during the week of July 10 through July 14 can be found on the following page:



Figure 15: SNYL.PK Weekly Price Chart (July 10 through July 14) My six week trading simulation with penny stocks ended on July 14. Analysis of the simulation in its entirety may be found in Chapter 7.

6.2. Swing Trading

I invested \$100,000 in Johnson & Johnson (JNJ) on June 7 at a price of \$61.00 per share. I would have liked to invest earlier in the day when the price was lower but I ended up at the \$61 price. I decided to use this company for swing trading and set \$61 as the lower limit for my trading channel and \$62 as the upper limit. Perhaps I should have used better limits because in two weeks time, the price of the stock had not reached \$62. Johnson & Johnson's weekly activity for the weeks that I had money invested can be seen in the figures on the next page:



Figure 16: JNJ Bi-Weekly Price Chart (June 5 through June 16)



Figure 17: JNJ Weekly Price Chart (June 19 through June 23)

I think my limits were not advantageous for swing trading and actually proved ineffectual. I sold the shares on June 20 at \$61.60 for a modest profit. As it turns out, I could have made a more substantial profit if I had waited one more day I decided to find another company for swing trading. I decided to invest in Kraft Foods Inc. (KFT). I set my swing trading channel to between \$31.10 and \$31.20 and with my first transaction I was able to buy and sell at those exact prices. On June 21, I bought 3215 shares for a price of \$31.10 per share. That same day, I saw the price rise \$0.10, so I sold the shares and earned myself a profit. The next day I invested again. The price had dropped below my window boundaries to \$31.00 so I purchased 3225 shares. Again, during that same day the price rose again to my upper limit of \$31.20 and I ended up selling at \$31.26 per share. The activity for KFT for the week of June 19 through June 23 is in the chart below:



Figure 18: KFT Weekly Price Chart (June 19 through June 23)

I continued investing with KFT during my fourth week of simulation. At the end of my third week, the stock price was at a level in my channel but not anywhere near the lower limit. On Monday, June 26, the price was well below my channel during the first hours of trading. I invested right away and bought

3239 shares at \$30.87 per share. The stock then peaked at \$31.12 and started dropping. I sold at \$31.05. Based on the last trade and on the current trend within the stock, I readjusted my trading window to between \$30.85 and \$31.00. I watched the stock prices and on June 28 I invested at what appeared to be an upswing starting near \$30.85. After buying 3241 shares at \$30.85 per share, the stock price actually dropped to under \$30.80 and stayed there for about 24 hours. On June 29, the price rebounded back into range and, in fact, rose above my upper limit of \$31.00. After seeing that the price would drop from a peak, I sold my shares at \$31.02 per share. The price only dropped for a short period and then rocketed out of my trading window to \$31.12. By the next day, June 30, the price had dropped, quite a bit, to under \$30.80 and I invested at \$30.77 per share. During the day of June 30, there was one opportunity where there was a peak at \$31.00 that I missed. By the end of trading on June 30, the price had dropped to \$30.90 and I missed any chance to sell. The price change activity for KFT during the week of June 26 through June 30 can be found on the next page:



Figure 19: KFT Weekly Price Chart (June 26 through June 30)

I sold my 3249 shares at \$31.00 on July 3 during my fifth week of simulation. Following the July 4 holiday, the stock price remained between \$31.00 and \$31.25 for little more than a day. All activity early on July 6 was in a downward trend and in fact the stock price plummeted almost \$1.00 below its previous level. After seeing such a drop, I altered my trading channel again, this time, to \$30.20 and \$30.50. On July 6, I purchased 3438 shares at \$30.23. For the remainder of the week, the price fluctuated in between my trading channel values and dropped below my lower limit for a short time. By the end of the trading week, the stock had not gotten close enough to my upper limit to warrant a sale, so I held on to my shares into the next week. Kraft Foods' price chart for July 3 through July 7 is on the following page:



Figure 20: KFT Weekly Price Chart (July 3 through July 7)

The week starting July 10 was my sixth and final simulation week. I started off this week with 3438 shares in KFT and I was looking to sell them. My adjusted trading window at that time was from \$30.20 to \$30.50. At the start of the week the price was around and just under \$30.30 per share and it stayed that way for all of July 10. At the start of trading on July 11, the stock price began an incline and I noticed this incline when the price climbed higher than \$30.30 and kept on climbing. Eventually, the stock peaked at \$30.47 and began to decline. I sold my shares at \$30.44 with the notion that the stock was headed back to the levels it experienced the day before. The stock dipped a little further but rebounded to \$30.49 for a brief period before dipping again to below \$30.30 and \$30.50, I altered my trading channel so that when the stock, hopefully, climbed back up to \$30.40 I would be able to invest. I changed my trading channel values to \$30.40 and \$30.50. On July 12, I began watching prices and noticed

that the stock did, indeed, climb back to \$30.40. I, then, invested at \$30.41 per share. Fortunately, I failed to notice when the price had risen to \$30.50 and when I got the chance to sell, I sold closer to \$30.60 and earned a larger profit. The price had peaked at \$30.61 and I was able to sell my 3441 shares at \$30.59 per share. The stock price, then, climbed to \$30.64 and dropped to below \$30.30 overnight and into Thursday morning. I reinvested while the price was well below my trading window and after it appeared to be making a rise. I bought at \$30.31 per share and sold much later in the day at \$30.39 per share after missing a great selling opportunity where the stock had peaked at \$30.50. I missed one more selling opportunity where the stock ascended from \$30.30 through \$30.48. Thus, I ended my simulation on July 14 with no trades on the final day. The figure below shows KFT's price activity for the final simulation week:



Figure 21: KFT Weekly Price Chart (July 10 through July 14)

7. Simulation Analysis

My stock market simulation ended on July 14 with moderate success. I feel I was able to execute my two investment strategies effectively and through use of established strategies, I gained a better understanding of some of what it takes to be a successful investor. Although the two divisions of my simulation are completely dissimilar, each method brought about its own challenges and successes.

My penny-stock simulation is where I had my best success, financially speaking. As seen in the following table, my profits and losses with each trade were fairly substantial.

Penny-Stock Simulation Trades								
		Buy/			Net Cost/			
Date	Symbol	Sell	Price	Shares	Proceeds	Profit/Loss	Total Cash	Total Asset
7-Jun-06	SNYL.PK	Buy	\$1.16	43097	\$49,992.52		\$50,000.48	\$99,993.00
7-Jun-06	SNYL.PK	Sell	\$1.20	43097	\$51,709.40	\$1,716.88	\$101,709.88	\$101,709.88
8-Jun-06	SNYL.PK	Buy	\$1.16	44571	\$51,702.36		\$50,000.52	\$101,702.88
9-Jun-06	SNYL.PK	Sell	\$1.24	44571	\$55,261.04	\$3,558.68	\$105,261.56	\$105,261.56
14-Jun-06	SNYL.PK	Buy	\$1.12	49340	\$55,260.80		\$49,993.76	\$105,254.56
14-Jun-06	SNYL.PK	Sell	\$1.19	49340	\$58,707.60	\$3,446.80	\$108,701.36	\$108,701.36
16-Jun-06	SNYL.PK	Buy	\$1.12	52411	\$58,700.32		\$49,994.04	\$108,694.36
19-Jun-06	EBLC.OB	Buy	\$0.04	1249676	\$49,987.04		\$0.00	\$108,687.36
26-Jun-06	EBLC.OB	Sell	\$0.03	1249676	\$37,483.28	(\$12,503.76)	\$37,483.28	\$96,183.60
27-Jun-06	SNYL.PK	Sell	\$1.04	52411	\$54,500.44	(\$4,199.88)	\$91,983.72	\$91,983.72
27-Jun-06	NDOL.PK	Buy	\$0.30	124920	\$37,476.00		\$54,500.72	\$91,976.72
28-Jun-06	SNYL.PK	Buy	\$0.94	57971	\$54,492.74		\$0.98	\$91,969.72
29-Jun-06	SNYL.PK	Sell	\$1.00	57971	\$57,964.00	\$3,471.26	\$57,964.98	\$95,440.98
29-Jun-06	NDOL.PK	Sell	\$0.34	124920	\$42,465.80	\$4,989.80	\$100,430.78	\$100,430.78
5-Jul-06	NDOL.PK	Buy	\$0.30	141530	\$42,459.00		\$57,964.78	\$100,423.78
7-Jul-06	NDOL.PK	Sell	\$0.32	141530	\$45,282.60	\$2,823.60	\$103,247.38	\$103,247.38
10-Jul-06	SNYL.PK	Buy	\$0.78	66183	\$51,622.74		\$51,617.64	\$103,240.38
11-Jul-06	SNYL.PK	Sell	\$0.83	66183	\$54,924.89	\$3,302.15	\$106,542.53	\$106,542.53
11-Jul-06	SNYL.PK	Buy	\$0.80	133168	\$106,534.40		\$1.13	\$106,535.53
13-Jul-06	SNYL.PK	Sell	\$0.83	133168	\$110,522.44	\$3,988.04	\$110,523.57	\$110,523.57

Table 1: Penny-Stock Simulation Trades

Just as expected with penny-stock trading, every trade produced a drastic change in financial status and caused extreme highs and extreme lows in profits. I felt the volatility and unpredictability throughout my simulation with penny-stocks. Each opportunity held heavy consequences and decisions were met with my equally heavy consideration. A jump of a few cents created a huge investment fluctuation and, in one case especially, a one cent drop yielded a loss upwards of \$12,000.

Many of my decisions called for such careful, measured action that taking the time to consider all variables proved somewhat disadvantageous. Analyzing price charts and technical analysis takes time and then the time to react to foreseen trends takes even longer. Penny-stocks, with their extremely volatile nature, called for constant watch of the market and the status of my investments. Though I missed a few opportunities, my near continuous watch of the market allowed for good selling chances and capitalization on most of my chances.

With my penny-stock simulation, for each successive trade, I invested all the cash from the previous trade. In other words, since I allotted \$50,000 to each half of my penny-stock simulation, I invested everything that I could for each investment and I didn't hold any cash back. I varied my strategy slightly for my swing trading simulation but I, inevitably, determined that by investing as much as possible (and also taking the most risks), my rewards were greater and my goals came closer into reach.

My penny-stock simulation met the goals that I had set out with from the beginning. My final asset total came to an impressive \$110,523.57 and yielded a

10.5% return on my initial \$100,000 investment. My goal for a 10% gain using an established investment strategy was thus achieved. I feel, though, that even with such remarkable results, the penny-stock trading strategy's risks outweigh its rewards. With careful observation and research, it is only *possible* to outsmart the market and come away with a profit. One false move and, as stated before, a price drop of one cent can leave an investor in utter ruin. The penny-stock's inherent instability alone should dissuade investors from pursuing such a dangerous course to profit, but there are very few things in the world as powerful as the promise of a fortune. The human drive to amass such a fortune is the fuel that keeps the stock market burning.

My only criticisms of a penny-stock simulation are that the hours spent watching the market for perceivable signs and indicators are long and intensive but, as such, a penny-stock simulation proves to be a worthwhile exercise and an extremely valuable learning experience. The simulation replicates exactly the time, effort and patience required to be successful in a real-life scenario. The simulation also helps to appreciate the seriousness of investment situations.

With my swing trading simulation, my financial success was not as outstanding but the simulation played itself out rather well. I first invested in a company (Johnson & Johnson) that turned out to be less than desirable in a swing trading simulation. After a few weeks of torment waiting for the stock to perform to my expectations, I invested into a different company (Kraft Foods Inc.) and was met with more promising results. The table on the following page summarizes each trade made during my swing trading simulation:

Swing Trading Simulation Trades								
Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Asset
7-Jun-06	JNJ	Buy	\$61.00	1639	\$99,979.00		\$14.00	\$99,993.00
20-Jul-06	JNJ	Sell	\$61.60	1639	\$100,955.40	\$976.40	\$100,969.40	\$100,969.40
21-Jun-06	KFT	Buy	\$31.10	3215	\$99,986.50		\$975.90	\$100,962.40
21-Jun-06	KFT	Sell	\$31.20	3215	\$100,301.00	\$314.50	\$101,276.90	\$101,276.90
22-Jun-06	KFT	Buy	\$31.00	3225	\$99,975.00		\$1,294.90	\$101,269.90
22-Jun-06	KFT	Sell	\$31.26	3225	\$100,806.50	\$831.50	\$102,101.40	\$102,101.40
26-Jun-06	KFT	Buy	\$30.87	3239	\$99,987.93		\$2,106.47	\$102,094.40
26-Jun-06	KFT	Sell	\$31.05	3239	\$100,563.95	\$576.02	\$102,670.42	\$102,670.42
28-Jun-06	KFT	Buy	\$30.85	3241	\$99,984.85		\$2,678.57	\$102,663.42
29-Jun-06	KFT	Sell	\$31.02	3241	\$100,528.82	\$543.97	\$103,207.39	\$103,207.39
30-Jun-06	KFT	Buy	\$30.77	3249	\$99,971.73		\$3,228.66	\$103,200.39
3-Jul-06	KFT	Sell	\$31.00	3249	\$100,712.00	\$740.27	\$103,940.66	\$103,940.66
6-Jul-06	KFT	Buy	\$30.23	3438	\$103,930.74		\$2.92	\$103,933.66
11-Jul-06	KFT	Sell	\$30.44	3438	\$104,645.72	\$714.98	\$104,648.64	\$104,648.64
12-Jul-06	KFT	Buy	\$30.41	3441	\$104,640.81		\$0.83	\$104,641.64
12-Jul-06	KFT	Sell	\$30.59	3441	\$105,253.19	\$612.38	\$105,254.02	\$105,254.02
13-Jul-06	KFT	Buy	\$30.31	3472	\$105,236.32		\$10.70	\$105,247.02
13-Jul-06	KFT	Sell	\$30.39	3472	\$105,507.08	\$270.76	\$105,517.78	\$105,517.78

Table 2: Swing Trading Simulation Trades

My methods while swing trading varied slightly from my penny-stock simulation. While investing all cash on hand in my penny-stocks, with swing trading, I invested as close to \$100,000 for each trade and held on to the profits separately and untouched. I was successful with this strategy. My profit margin slowly crawled upwards from my initial \$100,000. Unlike my penny-stock simulation, the profits earned from my swing trades were of a small, modest nature. Not once did a profit on a single trade reach \$1,000 whereas with my penny-stocks, not once did a profit or loss sink below the \$1,000 mark. The reasons behind profit discrepancy lie within the trading strategies themselves. As stated previously, swing traders don't look for gigantic single trades but rather chip away at the market to make their profits. This mode of thinking seems to work well and my simulation provides further evidence that small profits should be made with each trade.

Towards the end of my simulation in an effort to increase my profits to some extent, I abandoned my previous practice of only investing close to \$100,000 and tried investing all available funds for each trade. As expected and as common sense would have it, profits increased slightly from the values that would have been accrued previously from the same trades. All told, my goal for a 10% profit may have been too lofty for a swing trading simulation and I ended the six weeks with slightly more than a 5.5% profit to show for my effort.

The differences between penny-stock trading and swing trading are no more prevalent than in my simulation. Penny-stock trading is the type that dreams of financial fortune are made of. When imagining themselves investing in the stock market, most people picture amounting huge sums of wealth with quick flashy trades, fist-pumping profits and risks that are well worth it on the path to becoming a millionaire. Penny-stock trading can appear to be the glamorous side of the stock market. Swing trading, to the unknowing public, can appear to be little more effort than putting money in a bank and collecting the interest. Swing trading is slow and steady but if looked on for a long-term, somewhat lower-risk investment, it leads to exactly what any investor looks for: results.

Given the time period of my simulation, I am quite satisfied with the profits and progress that I made with each of my simulations. My penny-stock simulation met my profit goals and my swing trading simulation did not, though, if

done for a longer period, all signs point to the prospect that I would have met 10% profit with swing trading eventually. My other goals, however, were met on all counts by each simulation. My understanding of the stock market is, by far, greater than it ever was before and I am confident that with any future dealings in the stock market, I will be able to proceed as if in familiar territory.

8. Conclusions

This Stock Market Simulation IQP was carried out during E term and the summer of 2006. Through practice with trades, analysis of important investment decisions, and use of available online resources, I began with a goal to learn about the stock market and its daily operations and finished with a good deal of valuable first-hand knowledge.

As I'm sure is a problem with all forms of market analysis, by the time a decision is made, circumstances in the market can change, sometimes radically. The best-case scenario would be an instantaneous analysis and reaction to market stimuli, but this, of course, is nearly an impossible task in the human mind. Specifically, with my simulation, by the time I identified trends or by the time I had a chance to check up on my investments, good, strong chances to make a financial climb had passed and I was left with, in certain instances, less than the maximum possible gains. This, as I have learned, is the nature of the market. Timing is the most vital skill any investor can acquire.

Like any prized skill, stock market analysis requires a great deal of practice in order to perfect. My simulation did not provide that amount of practice and further practice would be necessary to come close to any sort of guarantee of success. My simulation is a good starting point for further diving into the daily workings of the modern stock market. This simulation and research provided me with encouragement and confidence for future, real investment. My simulations changed many of my perceptions, mainly, that the stock market is not as intimidating as I once thought and is actually quite accessible to anyone with the capital, ambition and determination to make it work for them.

The most important knowledge garnered from this project is that knowledge, itself, is the key to unlocking the stock market. The stock market is not the unfathomably complicated system that I once thought it to be. Online or in books, the information is out there and all anyone has to do is read it and use it.

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