Trading and Investment Strategies:

An Introduction to Analyzing and Developing Efficient Portfolio Management and Currency Trading Strategies

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1 ABSTRACT

The purpose of this report is to provide an introduction to investing through the analysis of our Interactive Qualifying Project. The report spans the concepts of basic economics, investable markets, creating a methodology for investing, and a breakdown of individual strategies. These concepts, all taken into consideration, culminate in the presentation of our four individual strategies in this report; all of which were implemented over the course of the project. Our individual strategies demonstrate the steps of trading strategy development, implementation, and results analysis. Three of the four strategies present different currency trading techniques: a trend following strategy, a stochastic, average directional index, and relative strength index strategy, and a strategy based off of major economic news. The fourth strategy is an equity based strategy focused primarily on trading stocks that are affected by election years.

2 ACKNOWLEDGEMENTS

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4 INTRODUCTION

The purpose of this Interactive Qualifying Project is to learn how to manage one's wealth through creating and implementing different investment strategies. Managing one's wealth is one of the most under-emphasized needs for most college aged students today. Protecting and growing one's savings is something that is rarely taught. As a group of Worcester Polytechnic Institute juniors preparing to enter the workforce in less than two years, we sought to learn, develop, and test strategies that we could use in our future to invest and manage our wealth.

Entering the working world, it is important to start saving for retirement as soon as possible. One of the most proactive ways to prepare for the future is learn how to manage one's own wealth. More often than not, personal retirement funds and investment funds are overlooked as they are managed by others. Today, through the use of technology and the internet, everyone has the opportunity to manage their own wealth without the use of money managers. Even with resources readily available, people still rely on money managers to invest their money for them due to a lack of knowledge in investing.

The Trading and Investment Strategies Interactive Qualifying Project is an in depth examination of the methods and strategies used on investable markets in order to gain long-lasting investing experience. Through simulated trading experience, we learned how to invest in different markets and develop strategies for trading them. For example, trading currencies can be a great means for consistent short term returns but requires a lot of time and management, whereas trading equities can provide sustainable growth in the long term as one prepares for future financial needs. In either case, the ultimate goal is capitalize on returns and grow wealth over time.

5 BACKGROUND

5.1 FINANCIAL TERMINOLOGY

The following definitions are basic financial terms related to investing:

- **Asset**: An asset is property of a person or company that is regarded to have value.

- **Liability**: A liability is a financial obligation or debt.

- **Liquidity**: Liquidity is a measure of the amount of time it takes to convert assets to cash.

- **Solvency**: Solvency is an entity's ability to pay off long-term debt.

- **Volatility**: Volatility is a measurement of risk and is the rate that the price of a security changes.

- **Interest Rate**: An interest rate is the cost of borrowing money and interest is paid on a percentage basis. Interest rates may vary depending on the risks associated with lending money.

5.2 BASIC ECONOMICS

Economics is the study of resource allocation and decision making. With any type of investing, economics have a fundamental role. Two economic principles that are advantageous to understand before investing are supply and demand and business cycles.

5.2.1 Supply and Demand

The main principle behind the supply and demand of an asset is that as supply increases, demand decreases, and as demand increases, supply decreases. As a result of the relationship between supply and demand, pricing is affected. When demand is high and supply is low, the buyer of the asset is willing to pay a higher price due to the asset's current rarity. Using the same logic, when supply is high and demand is low, the price the buyer is willing to pay for asset at hand decreases due its abundancy. When the amount of supply meets the amount of demand for an asset, the price is said to be at **equilibrium**. The figure below illustrates these principles:

Supply and Demand

Equilibrium

Price

Quantity
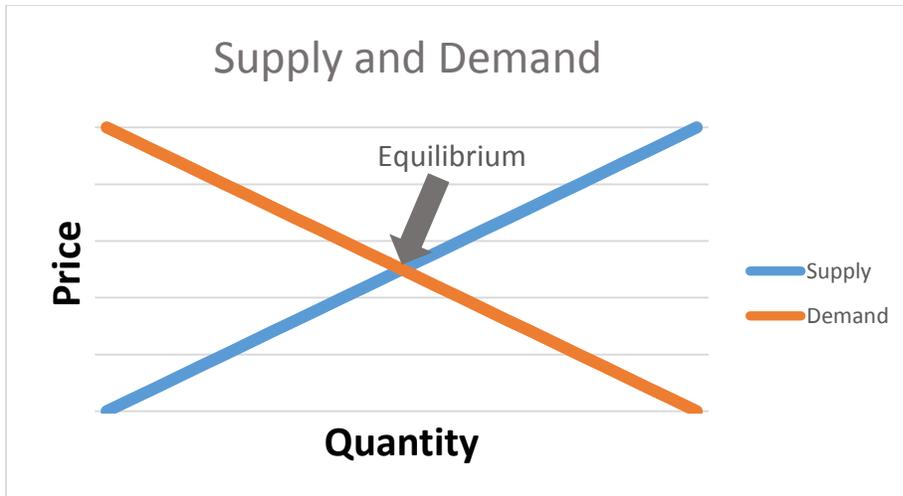
Supply

Demand

Here the equilibrium point can be seen where the supply and demand lines cross.

5.2.2   Business Cycles

A **business cycle** is an explanation of economic activity and movement. Business cycles are applicable on a small scale to companies and on a larger scale to countries. Business cycles are marked by four distinctive periods: peaks, contractions, troughs, and expansions. The **peak** of a business cycle is the height of economy activity. The peak is followed by the contraction period. The **contraction** period is a time of decreasing economic activity, generally marked by decreasing employment and decreasing sales. Following the contraction period, the **trough** is the lowest point and bottom of economic activity. The trough is followed by the expansion period in the business cycle. The **expansion** period is a time of increased economic activity, generally marked by lower unemployment rates, increased sales, and high growth. The figure below depicts the business cycle:

The Business Cycle

Peak

Contraction

Expansion

Trough
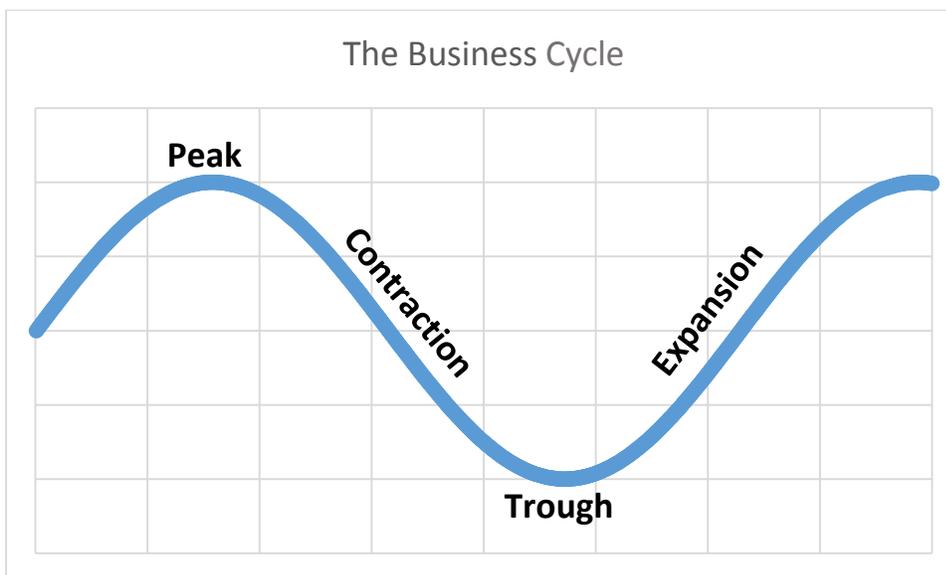
5.3 INVESTABLE MARKETS

When looking to either invest or trade, it is imperative to understand what the market is and how the market operates. There are four possible markets one can invest or trade on: the equity market, the currency market, the options market, and the futures market.

5.3.1 Equity Market

The equity market, also commonly known as the stock market, is a means for companies to raise capital. Companies raise capital through issuing stock. A **stock** is a share of a company representing part ownership and a claim to the company's assets and earnings. Furthermore, there are two types of stock: common stock and preferred stock. A **common stock** generally entitles the owner to a claim to voting rights and dividends. A **dividend** is a periodic payout of earnings from a company to its shareholders. A **preferred stock** generally does not grant voting rights but does receive dividends and claim of assets and earnings before common stock. An owner of stock, preferred or common, is known as a **stockholder**. The amount of claim a stockholder has within a company is proportional to the amount of shares owned compared to the total amount of shares on the market. Therefore, the price of a stock is representative of a proportion of the market valuation of the worth of a company. The market valuation of the worth of a company is found by multiplying the total number of shares of a company by the price per share of the stock and is known as the **market cap**.

The sizes of a company's market cap correlates to the size of the company and categorizes companies on the stock market. Companies generally with less than two billion in market cap are known as **small cap** stocks. While, companies generally with more than ten billion in market cap are known as **large cap** stocks. Although, the exact market cap values may vary by definition, the definition of small cap and large cap stocks itself does not. Large cap stocks refer to large, stable companies like Alphabet Inc. or General Electric whose size mitigates volatility through its liquidity and solvency. Small cap stocks refer to smaller, less stable companies who are less likely to be able to absorb or sustain significant losses. As a result, small cap stocks are generally seen as more volatile than large cap stocks. Furthermore, small cap stocks are seen to have more potential for growth than large cap stocks because a small cap stock may become a large cap stock in the future.

In addition to looking at the cap size of a company, it is important to identify the sector the company is in. A **sector** is a group of companies that produce the same type of goods or services in

an economy. There are many possible sectors a company can identify with but some of the most common in stock trading are: technology, healthcare, energy, financials, materials, and utilities. Understanding sectors is important in investing and trading equities because different sectors have different risk profiles. A **risk profile** describes the potential for losses or gains as a result of expected volatility. For example, comparing the risk profile of the utilities sector to the healthcare sector, the utilities sector is generally less volatile. With this knowledge, if an investor wanted less volatile, steady growth, he or she may invest in an electricity company in the utilities sector. If an investor wanted to take on more risk for hopes of a higher return over time, he or she may invest in a pharmaceutical company in the healthcare sector.

While one can invest in a company within a sector, it is also possible to invest in a sector itself through the use of an exchange traded fund or ETF for short. **Exchange traded funds** are funds that own underlying assets and divide the ownership of the assets through shares. The price per share of an ETF is determined by the total price of all underlying assets added together divided by the number of shares on the market. ETFs can be bought and sold the same way as common stock on the stock market. Furthermore, ETFs make it possible to invest in sectors when the underlying assets of the ETF are the stocks of the companies in a particular sector. That being said, it critical to look at the underlying assets an ETF is comprised of before purchase to really know what is in the ETF. Furthermore, when looking to invest in a particular stock, it may be useful to track an ETF representing the sector the stock is a part of. By following the sector and the stock, a stockholder can compare returns to the sector as a whole and get a sense of the stock's volatility compared to the other stocks of the same sector.

Along with stocks and ETFs, there is another type of asset traded on the equity market called mutual funds. A **mutual fund** is an entity that invests and manages a pool of money from and for investors. Mutual funds allow the opportunity for investors with small amounts of capital to have their money invested and managed professionally without hiring a personal financier. Mutual funds are able to use the pooled money to invest in the equity market in places where a small time investor may not be able to. With that being said, each investor owns a portion of the fund's holdings proportional to the amount of shares of the fund he or she owns. The price per share of a mutual fund is based on the mutual fund's net asset value. The **net asset value** of a mutual fund is the fund's assets minus any outstanding liabilities divided by the total number of shares on the market. Just as with ETFs, before buying into a mutual fund it is pertinent to understand the

underlying information of the fund. The **prospectus** of a mutual fund details the fund's investment types, past performance, risk tolerance, goals, and associated fees. With mutual funds there are generally three fees that may apply: front end load fees, back end load fees, and yearly fees. A **front end load** fee is a percentage of the original investment or flat fee that is taken out when at the time of entering a mutual fund. For example, if someone invests 500 dollars in a mutual fund with a five percent front end load fee the mutual fund takes 25 dollars with the fee and the investor is left with 475 dollars invested: $500 - (500 \times 0.05) = 475$. A **back end load** fee works the opposite way as a front end load fee and the fee is collected when an investor withdraws his or her capital from the mutual fund. For example, if an investor puts 1000 dollars in a mutual fund with a six percent back end load fee and after a year the investor withdraws his or hers accumulated money, now at a value of 1200 dollars, the investor would receive 1128 dollars after the fee is applied: $1200 - (1200 \times 0.06) = 1128$. Some mutual funds may also have a yearly fees outlined in the prospectus which go towards pay for the costs of running the fund and managing the money invested in the fund. A mutual fund without commission, a front end load fee, or a back end load fee is known as a **no load fund**.

While front end load and back end load fees may apply to mutual funds, there are other commissions associated with buying and selling stocks and ETFs. The commissions associated with trading on the equity market come from the coordination of how stocks, ETFs, and mutual funds are traded. Stocks, ETFs, and mutual funds are traded on a stock exchange. A **stock exchange** is a hub for trading; it matches sellers with buyers and executes transactions as efficiently as possible. The largest stock exchange in the world is the New York Stock Exchange (NYSE) and it is open from 9:30AM to 4:00PM EST Monday through Friday. In America, 9:30AM to 4:00PM EST Monday through Friday are the standard trading hours for the equity market. The everyday person does not have access to openly trade on an exchange. However, the everyday person does have access to a broker. A **broker**, which is generally a firm, facilitates trades received from investors to the stock exchange for the investors. Most brokers do not provide these services for free and charge a **commission** for executing a trade for an investor. Furthermore, commissions are paid on per trade basis. It is important to keep track of commission costs while trading the equity market to keep track of true profits and losses. For example, if someone buys one share of a 100 dollar stock and there is a seven dollar commission, then buying the stock costs seven dollars in commission and selling the stock costs another seven dollars; owning one share of this stock would not become profitable unless the price per share of the stock increased to above 114 dollars. The amount of

increase per share to cover the costs of commissions could be diluted by buying more than one share; as the cost of commission does not change, owning more shares would require less of an increase in price per share to be profitable.

At this point, it has been shown that stocks, ETFs, and mutual funds can be invested in on the stock market with associated fees. The next question at hand is: how does one choose a stock and determine a good investment from a bad investment? There are two types of analysis that investors commonly use to evaluate potential stock investments with: fundamental analysis and technical analysis.

Fundamental analysis is assessing the price of a company's stock by looking at the intrinsic value associated with its earnings, revenues, expenses, market capture, growth prospects, competition, and any other relevant business or financial data. On a basic level, fundamental analysis generally starts with looking at earnings reports. An **earnings report** is a report released once per quarter of the year publicly announcing a company's quarterly financial performance and outlook on the future. Earnings reports include quarterly sales, revenues, and profits/losses. With fundamental analysis, a company's profitability is a very important factor for growth and valuation of a company's stock price. An unexpected drop in sales and revenues of a company in an earnings report more often than not will follow with a drop in the company's stock price as the company appears less profitable. At the same rate, a company whose earnings report beats expectations can be expected to see a stock price increase as it appears to be a strong, more profitable company. Fundamental analysis of a company does not have to be done at a quarterly rate and for long-term investing it may be more useful to look at all of a company's historical reports to capture a better image of a company's market and financial standings. Furthermore, fundamental analysis of a company's competitors and sector can give a lot more information about a company from a broader, more comparative point of view. The sales and revenues of a company may be increasing over time, but if a company is increasing in sales and revenues at a pace slower than other the companies in the same sector there may be a better investment available.

There are also some related short-hand terms that an investor may use to fundamentally analyze a stock. The **price to earnings ratio** or **P/E ratio** is the price per share divided by the earnings per share. A low P/E ratio can either mean a company is doing very well or it is currently undervalued. A high P/E ratio can be interpreted to have higher expected earnings in the future compared to companies with lower P/E ratios. Comparing P/E ratios within a sector is a good

fundamental analysis practice in analyzing a stock. Another common term used in stock trading, and sometimes perceived as the most important, is earnings per share. **Earnings per share** or **EPS** is the net income of a company divided by the total number of shares on the market. EPS is used to measure the profitability of a company on a per share basis.

The other type of analysis, **technical analysis**, assesses investment opportunities by looking at historical prices and trading volumes to identify patterns and predict future price behavior. Historical prices of securities can be analyzed on many different time intervals; minute prices, hourly prices, daily prices, weekly prices, and full history prices. The historic prices per interval are commonly summarized by candlesticks. A **candlestick**, also known as a **bar**, is a box and whisker plot that shows a security's open, close, high, and low over a given length of time. The **open** of a security is the price of the security at the beginning of the interval. The **close** is the price of the security at the end of the interval. The open and close constitute the box of the plot. The **high** of a security is the greatest recorded price and the **low** of a security is the lowest price during the time interval; the high and the low constitute the whiskers of the box. The **volume** of a stock is the amount of shares traded on the stock market. The amount of shares traded can then be grouped by price movement: the amount of shares that were bought over a period of time when the price increased and the amount of shares over a period of time that were bought (or sold) when the price decreased. Technical analysis of a stock may show that it statistically probable that after three days of high amounts of volume traded and price decreases that the fourth day may see a price increase. This is just an example, but for an investor using technical analysis it may be a scenario with enough information to warrant buying the stock on the fourth day.

Whether using fundamental analysis, technical analysis, or a bit both for investment decision making, there is another useful tool for analyzing a stock called a beta value. The **beta value** of a stock is found through regression analysis and is a measure of volatility in price changes of a stock compared to movements in the market. The market is measured through the use of indexes. An **index** is a measurement of a section of the market through adding the stock prices of the market section. Indexes are not a tradable security but can be traded through ETFs comprised of the same stocks the index follows. The most common indexes are the Standard & Poor's 500 and the Dow Jone's Industrial Average. The **Standard & Poor's 500** or **S&P 500** is generally accepted as the best capture of the market as it follows 500 of some of the largest stocks from all sectors and accounts for about 75 percent of the total stock market. The **Dow Jone's Industrial Average** or **DJIA**

follows the 30 largest, richest, and most traded stocks on the stock exchange. Due to the amount of companies and broad range of the companies it follows, the S&P 500 is perceived as the general market indicator for the direction of the market. Thus, the beta value of a company is generally calculated using the S&P 500 as a measure of the market. As mentioned before, beta values, through regression analysis, measure the change in price of a stock in comparison to a change in the market. A stock with a beta value of one means that the stock can be expected to move in the same direction as the market; if the market increases, the stock should increase by a relatively close percentage. A beta value below one means the stock should be expected to move in the same direction of the market just less; if the market decreases, the stock should decrease by a smaller percentage. Lastly, a beta value above 1 means that the stock should move in the same direction of the market but at a faster rate; if the market increases, the stock should increase by a greater percentage. A negative beta value would work in similar regards but in the opposite direction of the market.

Beta values help measure the effects of market volatility and the price change of any given stock in comparison but then it is also important to measure volatility. The **Volatility Index** or **VIX**, also known as the "fear index", measures the market's 30-day volatility expectation. The 30-day expected volatility is made from the implied volatilities from the S&P 500. The VIX can be followed just like an index and not a tradable asset, but the implied information from the VIX may be helpful in making trades. VIX values greater than 30 are perceived as there being a period of high volatility and uncertainty in the future. VIX values below 20 are generally perceived as times of normal volatility without extenuating circumstances.

Finally, there is one more market circumstance that investors should be aware of with the equity market: the introduction of new stocks to the market. An **initial public offering** or **IPO** is when a company becomes publicly available on the market. A private company may want to go public, i.e. issue shares on an exchange, to raise capital. The IPO is the first time anyone outside the company will be able to openly invest in the company. The price per share at an IPO is calculated through fundamental analysis of the company, comparison to similar companies, and is a base valuation of the company's worth. Following the IPO, the stock price may have a period of increased volatility associated with the stock as it does not have a price history. Without technical analysis as an option, investing in IPOs requires in depth fundamental analysis.

5.3.2 Currency Market

Money is made and lost on the currency market through exchange rates and trading currencies. Currencies are traded on the Foreign Exchange and the currency market is often referred to as the Forex. Currency trading on the Forex is done by trading currency pairs. A **currency pair** is the relationship between the values of two currencies. Currency pair ticker symbols are six letters long and comprised of both abbreviated currencies. The first currency listed in the ticker symbol of the pairing is known as the **base currency** and is the currency being bought. The second currency listed in the ticker symbol of the pairing is known as the **quote currency** and is the currency being sold. An example of a currency pair that is commonly traded is the EURUSD. In this example, the euro (symbol: EUR) is the base currency and the United States dollar (symbol: USD) is the quote currency. When trading the EURUSD currency pair, United States dollars are being sold to buy euros. The amount of United States dollars it takes to buy a euro is known as an **exchange rate**. If the EURUSD ticker was trading at a value of 1.1400, then it would take 1.1400 United States dollars to buy 1.0000 euro.

Profits or losses can be achieved in trading the Forex as exchange rates change. Changes in exchange rates are measured in pips. A **pip** is one ten-thousandth of a dollar or 0.0001 in decimal form. Thus, if the EURUSD currency pair was bought at a value of 1.1400 and sold at 1.1401. The profit would be one pip; or one ten-thousandth of a United States dollar.

One ten-thousandth of a dollar is not a lot of money. This is why currencies are traded on a lot system. A **standard lot** is 100,000 units of base currency. Purchasing a standard lot of EURUSD results in the value of a change in one pip to be worth 10 United States dollars: $100,000 \times 0.0001 = 10$. The complete lot system is as follows:

Lot Name	Size		1 Pip	Dollar Change per Pip
Standard	100,000	×	0.0001	10
Mini	10,000	×	0.0001	1
Micro	1,000	×	0.0001	0.1000
Nano	100	×	0.0001	0.0100

From the table above, it is apparent that the more base currency one can purchase, the more a one pip change in a currency pair value is worth. To make or lose 10 dollars per pip with the

EURUSD currency pair, one would have to trade a standard lot. Following the example from before, where the EURUSD is valued at 1.1400, purchasing a standard lot would cost 114,000 United States dollars. This is a decently large amount of capital that many small-time traders may not have on hand. This issue is combatted through buying on margin. **Buying on margin** or **leveraging** is borrowing more money than one has to seek higher profits and using one's own money as collateral. In the United States, the largest one is allowed leverage his or her money with a broker is 50:1. Buying a standard lot of EURUSD at a value of 1.1400 on a margin of 50:1 would only require a capital investment of 2,280 United States dollars: $114,000 \div 50 = 2,280$. Buying on margin allows for greater possible profits but there is also an associated higher level of risk. If the leveraged losses equal the amount of money in an account the broker will exit the trade to protect itself from losses. For example, if a trader purchased a standard lot of EURUSD at the value of 1.1400 on margin for 2,280 dollars and the value dropped 230 pips to 1.1170, the losses would be 10 dollars a pip for a total loss of 2,300; 20 dollars more than the account value and the trader would owe the broker 20 dollars in addition to losing his or her whole account. A 230 pip change would be an extreme, but not impossible, event and it is important to understand the risks associated with leveraging.

Volatility in exchange rates help classify currencies into categories. In currency trading, the less volatile currencies are the currencies of the world's larger, more stable countries; predominantly the United States dollar, the Euro-zone euro, the Great Britain pound (symbol: GBP), the Australian dollar (symbol: AUD), the Canadian dollar (symbol: CAD), the New Zealand dollar (symbol: NZD), the Japanese yen (symbol: JPY), the Swiss franc (symbol: CHF). The EURUSD, USDJPY, GBPUSD, USDCHF, USDCAD, AUDUSD, and NZDUSD currency pairs are known as the **majors**. The majors are known for containing the USD, being the most liquid currency pairs, and being the most frequently traded currency pairs. There is also a subcategory called the **minors**, which consists of currency pairs of the same currencies but without the USD. Furthermore, the minors are not as liquid as the majors. Some examples of minor currencies pairs that could be traded are the EURCAD and the GBPJPY. In addition, currency pairs that consist of the USD and currencies from emerging, less stable countries are known as **exotic pairs**. Exotic pairs tend to be more volatile and may consist of currency pairs such as USDZAR, for example; comparing the United States dollar to the South African rand.

Volatility in currency pairs and exchange rates comes from comparing economies. The value of a currency is representative of a country's economic situation. Thus, changes in economic status have an effect on the value of a currency and exchange rates. Relative to other economies, the weaker an economy, the less value its currency has and the stronger an economy, the more value its currency has. For example, if the United States economy is getting stronger, the United States dollar is becoming more valuable and the EURUSD value may fall as it takes fewer dollars to buy euros. Today, it is very easy to follow a country's economic situation by following the news and economic indicators. Furthermore, economic calendars exist to help identify important economic news releases. Important economic news that has a macroeconomic impact in a country may be jobless claims, changes in interest rate, unemployment rates, changes in gross domestic product of a country, and changes in the consumer price index. It is important to understand how such macroeconomic factors impact currency pairs to get a sense of the direction currencies are heading in.

The currency market is open twenty-four hours a day, five days a week. The currency market's round the clock accessibility is a result of differing time zones and hours of operation of different exchanges. The major exchanges are open during the following times (EST):

Exchange	Open	Close
Frankfurt, Germany	2:00AM	10:00AM
London, Great Britain	3:00AM	11:00AM
New York, United States	8:00AM	4:00PM
Sydney, Australia	6:00PM	2:00AM
Tokyo, Japan	7:00PM	3:00AM

As new markets open each day there is increased volatility in the currency market. The increased volatility is a reflection of new investors reacting to news that was released earlier in the day. Knowing when markets open and close can help explain market volatility when there is not new news being released and should be taken into consideration when deciding what times during the day to trade.

Furthermore, it is important to note that the currency market is a commission-free market. Instead of a commission there is a pip spread. A **pip spread** is the difference between values one

can buy and sell a currency pair at. It generally costs one to three more pips to buy a currency pair than it does to sell the same currency pair. If the EURUSD was valued at 1.1400 buy price and the pip spread was two pips, then the sell price would be 1.1398. Thus, buying two standard lots of EURUSD and selling them immediately would result in a loss of 20 dollars. The pip spread has to be overcome before any profits can be achieved but it is a small-percentage, one-time cost to pay for a trade.

5.3.3 Options Market

The options market is one of the more lucrative markets to invest in. An **option** is a contract ensuring the right, but not the obligation, to either buy or sell an asset at a certain price at an expiration date. Options are a **derivative** security, meaning the price of an options contract is derived from an underlying asset. The **writer** of an options contract is the seller of the contract. The buyer or **holder** of an options contract has the right to buy or sell the underlying asset. The price the underlying asset is to be bought or sold at is called the **strike price**. The strike price and the price to buy an option contract are not the same and should not be confused with one another. The price to buy an options contract is generally much lower than the price of the underlying asset which helps distinguish between the two. The price of an options contract is determined through supply and demand of the underlying asset, the relation of the strike price and the current price of the underlying asset, the amount of expected volatility of the underlying asset, and the length of the contract.

An option is said to be **in the money** if exercising the right to buy or sell the underlying asset at the strike price is profitable to the holder. An option is said to be **at the money** if by exercising the right to buy or sell the underlying asset at the strike price the holder profits enough to break even with the cost of purchasing the option. Lastly, an option is **out of the money** if the holder would incur a loss by exercising the right to buy or sell the underlying asset at the strike price.

The right, but not the obligation, to buy an asset at a certain strike price is called a **call option**. The holder of a call option is in the money if the price of the underlying asset is higher than the strike price because the holder has the right to buy the underlying asset from the writer for less than it is worth. If the price of the underlying asset is lower than the strike price, the holder of the call option would not opt to exercise the option because the holder could buy the underlying asset on the market for less. In this scenario, the holder would incur the loss of the price it took to

purchase the option. The writer of a call option thinks the price of the underlying asset will decrease below the strike price over the term of the contract.

The right, but not the obligation, to sell an asset at a certain strike price is called a **put option**. The holder of a put option is in the money if the price of the underlying asset is lower than the strike price because the holder has the right to sell the underlying asset to the writer of the put option for more than it is worth. If the price of the underlying asset is higher than the strike price, the holder of the buy option would not opt to exercise the option because the holder could sell the underlying asset for more on the market. In the case of put options, the writer of the put option thinks the price of the underlying asset will increase above the strike price over the term of the contract.

To gain a better understanding of options and the profit schemes for holders and writers here is an example:

Suppose the price per share of a stock is currently 80 dollars a share. A writer believes that the stock price won't change very much in the next three months and sells a three-month, 80 dollar strike price call option on the stock and a three-month, 80 dollar strike price put option. The writer prices both options at five dollars each. Buyer A believes that the stock price is going to increase over the next three months so Buyer A purchases the call option from the writer. Buyer B believes the opposite and thinks the stock price is going to decrease over the next three months so Buyer B purchases the put option from the writer. Buyer A's and Buyer B's profit schemes depending on the stock price compared to their respective options are as follows:

Buyer A's Call Option Profit Scheme

Buyer A is out of the money when the stock price is below 85 dollars where the call option is at the money. Losses are mitigated unless the stock price is 80 dollars or below where the loss remains constant at five dollars. Above 85 dollars, Buyer A is in the money; and the higher the stock price is above 85 dollars, the greater the profit.

Buyer B's Put Option Profit Scheme
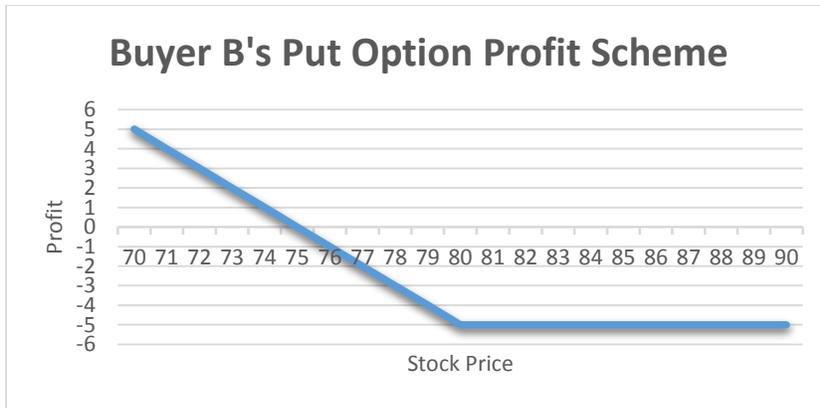
Buyer B is in the money when the stock price is below 75 dollars where the put option is at the money. The lower the stock price is below 75, the greater the profit. Above 75 dollars, Buyer B is out of the money, but losses are mitigated unless the stock price is 80 dollars or above where the loss remains constant at five dollars.

Buyer A's and Buyer B's profit schemes at the same strike price and purchase price are mirrors of each other; the shape of the profit scheme in these graphs is the same shape for any buyer of a call option or put option. The writer of the options has a flipped profit scheme. Combining the profit schemes from selling both a call option and a put option, the writers profit scheme looks like this:

Writer's Profit Scheme
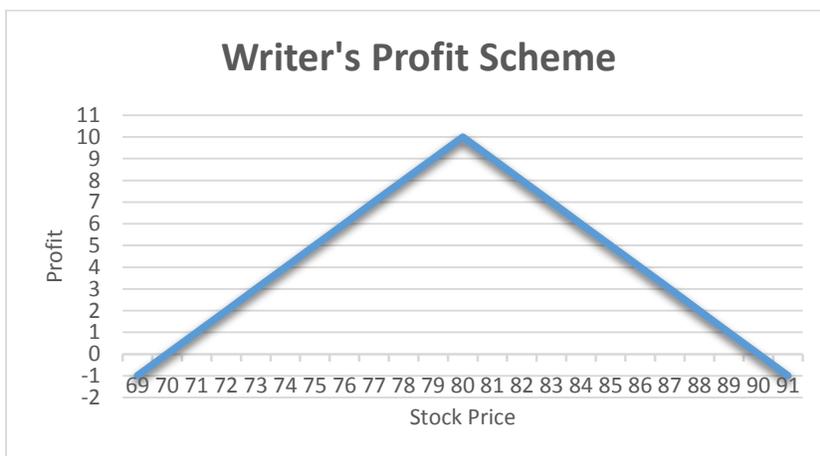
At a stock price of 80 dollars neither the call option nor the put option have value to the holders and the writer makes a maximum profit of 10 dollars from selling both options. The writer does not start to incur a loss in this situation until the price is either 10 dollars above or 10 dollars below the strike price. Furthermore, this profit scheme is known as a **straddle**.

Along with the two types of options there are also two styles of these options. A **European style** option is an option that can only be exercised at the expiration of the option. A mnemonic device to help remember that European style options are only exercisable at expiration is that both words starter with "e" and thinking expiration when one hears European. The other style of option is the **America style** where the option may be exercised at any time before the expiration. The American style option is more flexible because if the strike price on the underlying asset is ever in the money the holder can profit at that time if he or she wants.

Options are also closely associated with the equity market and can play an important role in hedging. **Hedging** is the process of mitigating potential losses. For example, a stock owner may buy

a six-month put option on the same underlying stock at a strike price equal to the current price of the stock. As a result, the stock owner is ensured that he or she will not suffer losses for any drop in stock price over the next six months. The options market and the equity market are often very much intertwined because many options contracts are written with stocks as the underlying asset.

From the writing side of options, maximum profits are achieved through sale of contracts that are out of the money. When options contracts are out of the money, the underlying asset is never exchanged between the writer and the holder. An out of the money put option will not require the writer to buy the underlying asset; and an out of the money call option will not require the writer to sell the underlying asset. In either case, the underlying asset never exchanges hands and the writer makes a full profit from the sale price of the contract. Furthermore, since the underlying asset never exchanged hands from the writer to the holder in the case of an out of the money call option, the writer never had to have purchased the underlying asset. Writing options contracts without owning the underlying is known as **naked writing**. Naked writing is a legal practice but if a call option contract was in the money and exercised, the writer has an obligation to sell the underlying asset and therefore must purchase and sell it.

5.3.4   Futures Market

The futures market is another one of the more risky, more complex, and more lucrative markets. The futures market is a means to buy and sell futures contracts and commodities. A **futures contract** is a derivative security wherein two parties agree to transact some amount of an asset at a future date for a particular price. A **commodity**, often the asset of a futures contract, is a basic good used in commerce. Some examples of commodities that are commonly traded in futures contracts include: grains, beef, and barrels of oil.

Futures contracts are created to help suppliers of an asset avoid the volatility of the market. On a basic level, take a farmer for example. A farmer may plant his corn when the price per bushel of corn is four dollars. Subsequently, the farmer plans his expenses and expected profits based off the projection that the price per bushel of corn will still be four dollars a bushel when he harvests. Due to the market volatility of the price per bushel of corn, it is possible that the price per bushel of corn may differ from four dollars at the time of harvest. At the time of harvest, if the price per bushel of corn is greater than four dollars the farmer would make a greater profit when he sells his corn, but if the price per bushel of corn is less than four dollars the farmer may not have profited

enough to sustain his farm during the next crop. The farmer avoids the risk of the price per bushel dropping below four dollars by the time he harvests by entering into a futures contract. When the farmer plants his seeds, he enters into a four dollar per bushel futures contract with a company that buys raw corn. In this manner, the farmer is assured to sell his corn for four dollars a bushel when he harvests it. If the price per bushel of corn is greater than four dollars at the time of transaction between the farmer and the company buying, the company buying the corn profits from buying the corn below the market price. If the price per bushel of corn is less than four dollars at the time of transaction, the farmer is more profitable as he is getting a better price for his corn than the market is currently offering.

As seen with the example of the farmer, changes in the price of the underlying asset of a futures contract can make the contract more or less profitable to each party. The value of a futures contract comes from the difference in the current market price of the underlying asset and the sale price associated with the contract. The greater the current market price of the underlying asset increases above the price in the contract, the more valuable the contract is to the buyer of the asset. Similarly, the lower the current market price of the underlying asset decreases below the price in the contract, the more valuable the contract is to the seller of the asset. The value of futures contracts are settled on daily basis.

The price of a futures contract is directly associated with the value of the contract. The price and value of a futures contract is most often affected by supply and demand. There are many factors that can affect the supply and demand of an underlying asset of a contract. The prices of agriculturally based futures contracts can be affected by the weather. A dry season may lower the supply of a type of produce and as a result buyers of the produce would be willing to pay more; ultimately, increasing the current market price until the supply can meet the demand. The prices of futures contracts based off of meat prices could be affected by diseases or infections amongst livestock. A disease amongst livestock could reduce the amount of animals available to butcher in the future and an infection amongst livestock could make the meat unsellable. Depending on the nature of the underlying asset, it is important to understand what factors will ultimately affect the price of a contract and how.

Furthermore, most investors in the futures market are speculators because investors tend to not want to end up buying or selling thousands of bushels of corn, drums of oil, or any other physical asset from buying or selling futures contracts. As a speculator in the futures market, an

investor is not responsible for the delivery or purchase of any underlying assets. Instead of trading cash for a physical asset, transactions amongst speculators are settled in cash alone.

5.4 ENTERING AND EXITING A MARKET

One can enter a market one of two ways: a long position or a short position.

5.4.1 Long Positions

Long positions are situations where one profits from a price increase of an asset. In a long position, one generally buys an asset and sells the asset at a later time. If the price of the asset at the time of sale is higher than the price it was purchased at then the investor makes a profit. If the price of the asset at the time of sale is lower than the price it was purchased then the investor incurs a loss.

Example: Suppose the price of Apple stock is 100 dollars per share today and you think the price will be greater than 100 dollars tomorrow. Because you think the price per share is going to increase tomorrow you take a long position and buy one share of Apple stock today; costing you 100 dollars. You now own one share of Apple. Let's say you were right in your original assumption that the price of Apple stock would increase and the price per share of Apple stock tomorrow is 110 dollars. You can sell the share for 110 dollars and profit 10 dollars on your original investment of 100 dollars. There is always the possibility that your original assumption is wrong and the price decreases the next day. If the price per share of Apple stock dropped to 90 dollars per share and you sold your share your profit would be -10 dollars; or a 10 dollar loss.

5.4.2 Short Positions

Short positions work in opposition to long positions as one profits from a decrease in the price of an asset. A short position works by borrowing the asset one wishes to short from someone else. Upon borrowing the asset, one sells it immediately. At a later time one buys the asset back and returns the asset to its original owner; this process is known as **buying to cover** as one *buys* the asset to *cover* one's obligation to return the borrowed asset. If the price decreases, the borrower, the owner of the short position, profits the difference between the price the asset was sold at and the price the asset was bought back at upon being returned. If the price increases, the owner of the short position incurs a loss when buying back the asset to return to the original owner because the borrower is buying back at a higher price than he or she sold it for.

Example: Say you are looking at Apple's stock again at a price of 100 dollars, but this time you think that the price tomorrow will be lower than it is today. Because you think the price per share is going to decrease to decide to short one share of Apple today. Through a broker, you borrow a share of Apple stock and sell it immediately for 100 dollars. You now own that 100 dollars but you also own the obligation to return the one share of Apple stock you borrowed. Let's say you were right in your original assumption that the price per share of Apple stock was going to decrease and tomorrow the price per share is 90 dollars. You can buy to cover one share of Apple for 90 dollars. In this situation your profit is 10 dollars; the original 100 you received selling the borrowed share minus the 90 dollars you paid the next day to buy and return the Apple share you borrowed the day before. If your original assumption was wrong and the price per share of Apple increased the next day to 110 dollars, you would incur a 10 dollar loss; buying to cover a share of Apple stock the next day at 110 dollars would require the 100 dollars you received when you sold the share the day before and 10 dollars of your own capital.

5.4.3   Relationship between Long and Short Positions

The relationship in profit between long and short positions is an inverse relationship. That is to say, when a long and short are entered at the same time and same price, if the price increases the short will produce a loss and the long will produce a profit; if the price decreases the short will produce a profit and the long will produce a loss.

The graph to the right shows the inverse relationship between long and short position profitability. Furthermore, the profit scheme follows the Apple example precisely.	
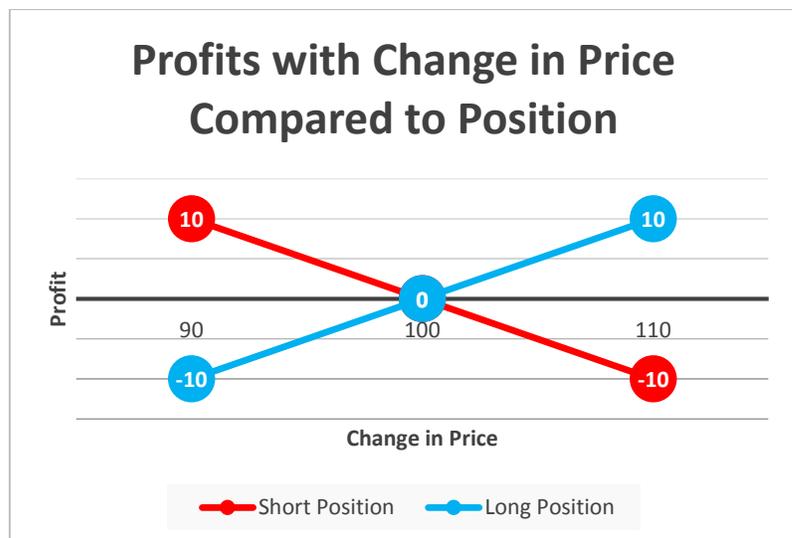
5.4.4 Positions in the Options Market

The inverse relationship between long and short positions is helpful in understanding the type of position the writer and the buyer of an options contract are in. With a call option, the writer maximizes profits when the price of the underlying asset decreases below the strike price of the contract. Therefore, the writer has a short position. The buyer of a call option has a long position because the holder profits most from price increases above the strike price. With a put option, the writer maximizes profits when the price of the underlying asset increases above the strike price of the contract. In this case, the writer has a long position. The buyer of the put option has a short position because the holder benefits most when the price of the asset is below the strike price of the put option.

5.4.5 Positions in the Futures Market

In the futures market, the buyer of a futures contract has a long position. The buyer's long position is a result from the fact that a price increase of the underlying asset above the price in the contract is increasingly profitable for the buyer. In contrast, the seller of a futures contract profits the more the price of the underlying asset decreases below the price in the contract. Therefore, the seller of a futures contract has a short position.

5.4.6 Entry Order Types

- **Market**: Entering a long position, a market order is an entry that buys into a market at lowest, most immediate price available. Entering a short position, the market order will sell a security at highest, most immediate price available.
- **Limit**: A limit order executes an order at a specific price or better. A limit order to buy long will execute when the market price is equal to or lower than the limit price. A limit order to sell short when the market price is equal to or greater than the limit price.
- **Stop**: A stop order to buy long is to buy at market above the current market price if the order price is reached. A stop order to sell short is to sell at market below the current market price if the order price is reached.
- **GTD & GTC**: GTD and GTC stand for good till date and good till canceled, respectively. With a **GTD** order, an end date can be associated with an entry order and if the order is not executed or filled by the specified date, the order will be terminated. A **GTC** entry order will stay on the market as long it takes the order to be executed and filled or canceled manually.

5.4.7 Exit Order Types

- **Market**: A market exit will sell or buy to cover at the most current prices on the market.

- **Stop Loss**: A stop loss is an order that will exit the market at a specific amount of losses incurred compared to the purchase price.

- **Limit**: A limit order as an exit will sell a long position at the limit price or higher and buy to cover a short position at the limit price or lower.

- **Trailing Stop Loss**: A trailing stop loss is a stop loss that takes profits into consideration. The specific amount of losses an investor is willing to incur stays constant but the price of execution changes. For example, a stock may be purchased at 100 dollars with a 10 dollar trailing stop loss. Without an increase in price, the trailing stop loss acts like a regular stop loss and will exit the position at a price of 90 dollars. Although, if the price of the stock increases to 105 dollars before decreasing, the trailing stop loss would then exit the position if the stock price were at 95 dollars instead of 90.

- **Take Profit**: A take profit order will exit the market at market price only if a specific profit level is reached.

- **GTD & GTC**: GTD and GTC work the same way for exit orders as they do for entry orders.

5.5 MARKET MOVEMENT

Markets tend to move in one of three directions: upward, downward, or sideways. When a market is moving upwards consistently with higher highs and higher lows it is called an **uptrend**. Uptrends are associated with the expansion period of the business cycle and may differ between sectors by start, volatility, and duration. With increasing prices, long positions are more profitable than short positions during uptrends. When a market is moving downwards consistently with lower highs and lower lows, the market is said to be in a **downtrend**. Downtrends are associated with the contraction period of the business cycle and also may differ by sector. Downtrends are more profitable for short positions than long positions as prices are decreasing. Due to volatility in the markets trends do not move smoothly on a line up or down. Instead, trends oscillate upwards or downwards. When a market isn't oscillating upwards or downwards the market is known to have a sideways trend. A **sideways trend** is a horizontal price movement. Sideways trends are generally associated with the peaks and troughs of the business cycle and demonstrate a time price direction

uncertainty. It may be difficult to identify what type of trend a market is moving in and subsequently what type of position to take, if any, but that is what creating a strategy is for. The figures below depict an uptrend, downtrend, and sideways trend:

Uptrend

Price

Time

Downtrend

Price

Time

Sideways trend

Price

Time
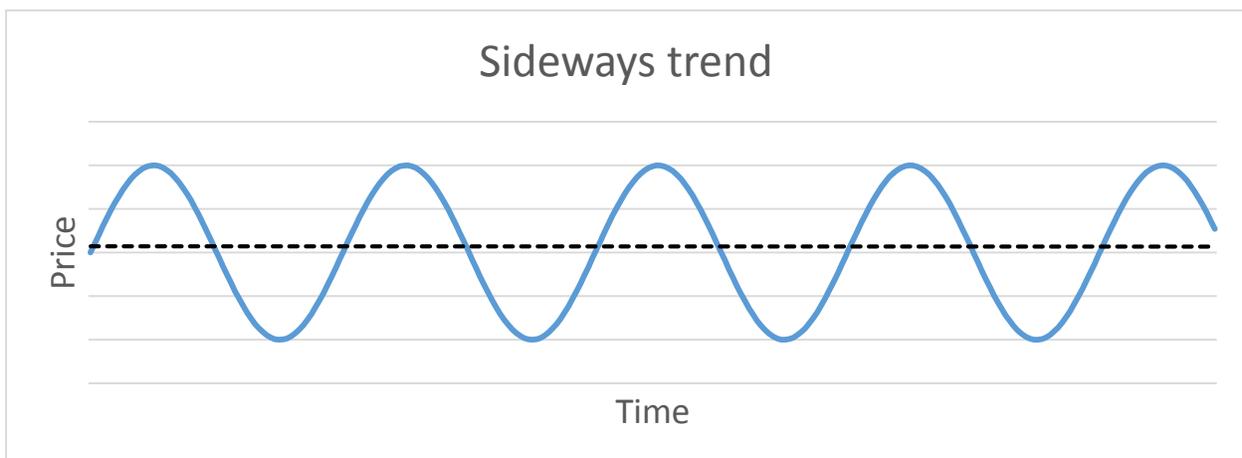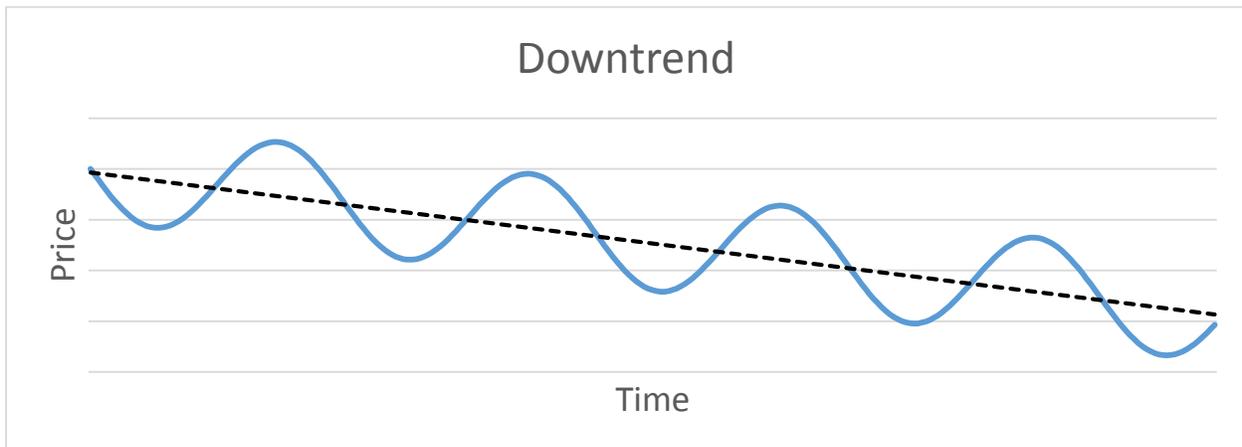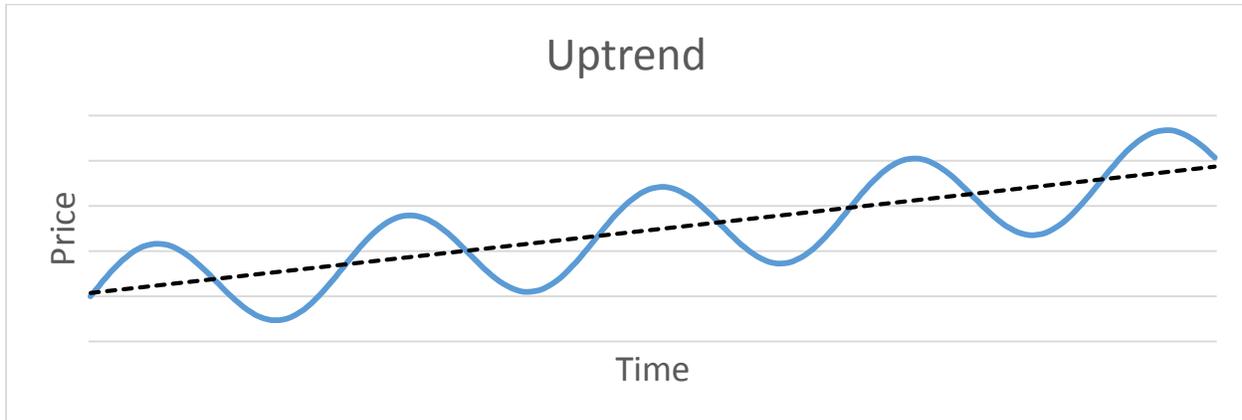
6 METHODOLOGY

6.1 STRATEGY DEVELOPMENT

The following are basic terms related to strategy development:

- **Indicator**: An indicator alerts the trader of a predetermined market condition.
- **Strategy**: A strategy implements indicators in a set of rules of when to enter and exit a market.
- **System**: A system implements a group of strategies where each individual strategy is implemented during a different market movement.

There are several different time frames over which one can invest. Depending on the time frame and motivation for making an investment, one can be identified as an investor or a trader. Investors and traders differ in many areas; notably, risk profiles and goals. An **investor** deals in equities and feels he or she is a part of the company. As such, investors may be morally obliged to not bet against a company through shorting. Investors tend to focus on the dividend potential of stocks. On the other hand, a **trader** tends to make more short term investments and only cares about the success of the investment, not the success the underlying security. Thus, traders do not have any qualms with any long or short positions in any market as long as it makes a profit. The following are types of investors and traders distinguished by the period over which trades are held:

- **Flash Trader**: A flash trader holds trades less than a second using high speed computers.
- **Scalper**: A scalper holds trades from seconds to minutes.
- **Day Trader**: A day trader trades over the course of a few minutes to hours and is always out of the market at the end of the day.
- **Swing Trader**: A swing trader holds trades for a few days to a few weeks.
- **Intermediate Term Position Trader**: An intermediate term position trader holds trades for a few weeks to a few months.
- **Long Term Position Trader**: A long term position trader holds trades for several months to a few years.
- **Investor**: An investor will buy and hold a security for an extended period of time.

- **Active Investor**: An active investor will buy and hold a security for an extended period of time while managing it.

The time frame a trader decides to trade on can be characterized by his or her risk profile. Before beginning to trade, a trader needs to evaluate how much risk they are willing to undertake. A **risk averse** person prefers very low risk situations. Low risk is associated with smaller profits and losses as there is less volatility and less price movement. A **risk tolerant** person is willing enter riskier situations. Greater risk is associated with more volatility and more price movement, resulting in opportunity for more profit as well as more loss. Risk averse traders tend to use strategies that win more frequently, correlated with smaller profits and smaller losses. Risk tolerant traders tend to use strategies that may suffer losses in hopes for a larger payoff.

In strategy development, according to Charlie Wright's book *Trading as a Business*, traders tend to go through three distinguishable stages: discretionary, technical, and strategy.

- **Discretionary**: A discretionary trader trades entirely based on intuition. Discretionary traders often claim to have a feeling about a market and invest accordingly without any quantifiable data. Furthermore, discretionary traders are often impatient, invest on impulse, and are rarely profitable.

- **Technical Trader**: A technical trader is a "graduated" discretionary trader who uses indicators and basic strategies to back up decisions made on intuition. Although a technical trader follows a set of rules and indicators, a technical trader does not always them. Generally, technical traders get lost in a myriad of available strategies and indicators; constantly searching for the perfect strategy. Often times, technical traders attend seminars and lectures in an attempt to find a perfect strategy, and often spend far too much money and time for them. At some point the trader learns that the market moves unpredictably and the use of intuition, indicators, and strategies does not guarantee success.

- **Strategy Trader**: Strategy traders have developed a set of rules to follow rigidly. A strategy trader uses a system of strategies in combination and use quantifiable data in his or her strategy design. A strategy trader won't incorporate a new strategy into the system without thorough testing. Quantifiable data in this sense may include but is not limited to prices, trend length, or volume.

A strategy trader takes the type of market, the market directions, his or her risk profile, and trading time frame into consideration when creating a strategy. Different strategies may incorporate different indicators, entries, and exits depending on this criteria. A strategy may only make long trades, may only make short trades, or trade both positions. A strategy can be automated or manual. An **automated trading** strategy executes entry and exit orders from code. A **manual trading** strategy only executes trades at the hand of the trader. Creating a strategy, whether it is manual or automated, takes time and there are a lot of details involved, but the overall goal of strategy development is profitability.

Automated trading strategies have the unique aspect of being able to be back tested and optimized. A **back test** runs the strategy code over past prices and shows where the strategy would have made trades and the resulting outcomes. An **optimization** back tests a strategy multiple times, changing parameters to find the most profitable version of the strategy. Optimization can be a very useful tool but it isn't without its downfalls. When optimizing a strategy, a trader needs to be aware of curve fitting. **Curve fitting** is the phenomenon when an optimization over fits a strategy to past prices. Curve fitting is problematic because future prices are not dictated by past prices. Curve fitting can be addressed by running an optimized strategy on several different securities in the same market. A strategy that is not curve fitted to a single security should be profitable back tested on several securities. Furthermore, a trader can back test and optimize over different time periods to see a strategies performance under different market conditions.

6.2 ANALYZING A TRADE

After a trade is made, an investor can analyze the trade for many factors in comparison to the size of a position and the size of an account. Trades have realized and unrealized profits and losses. An **unrealized profit or loss** is the current profit or loss that would be incurred if a trade in the market was exited. A **realized profit or loss** is the actual profit or loss incurred at the exit of a trade. Once a trade is exited, the **drawdown** is the largest unrealized loss over the time period of the trade. Trades with large drawdowns and small profits can be perceived as more risky. The drawdown value becomes increasingly more important trading on margin with currencies as it nears the size of the account. In comparison to account size, a trade can be analyzed as a percentage return on initial capital. Furthermore, the trade can be projected forward to give an **annual rate of return**; or

expected percentage gain suggesting similar trades can be made for one year. Analyzing trades is essential is assessing strategy profitability and efficiency.

6.3 INDICATORS AND STRATEGIES

All strategies are created based around some type of indicator. The following subsections describe several strategies and the indicators related to them.

6.3.1 Moving Averages

A **moving average** is a technical indicator that is calculated by taking the mean of the price of a set number of past bars. Typically, moving averages are calculated using either the open price or close price of a bar. Moving averages "move" by recalculating the average of the set number of past bars with the newest bars available.

A single moving average can be used as an indicator called a **simple moving average** or SMA. A common critique of the simple moving average is that all of the prices are weighted the same no matter where the price appears in the data set. A solution to this critique is another type of moving average is the exponential moving average or EMA. The **exponential moving average** gives more weight to recent prices in order to be more receptive to newer information. The EMA is calculated using the following equation: EMA = ('Price' $\times \alpha$) + ['Previous EMA' $\times$ ($1 - \alpha$)] where α = [$2 \div$ ($1 +$ 'number of bars')]. Due to the heavier weighting of newer prices, the EMA can detect trends quickly as it has potential to rise and fall steeply. The EMA is favored more by traders because it responds more drastically to newer information.

One of the most common strategies using moving averages is called the double moving average crossover or DMAC. The DMAC makes use two moving averages: a short term and a long term moving average. A **crossover** is generated when the two moving averages cross under or over each other. The crossover is an indicator of market direction. When the short term moving average crosses the long term moving average from below, it is known as a **golden cross** and is an indication of an uptrend. A golden cross in the DMAC strategy indicates an opportunity to take a long position. When the short term crosses the long term moving average from above, it is known as a **death cross** and is an indication of a downtrend. A death cross is an indicator of a short position opportunity. It is important for the two moving average strategy that both moving averages are calculated using past numbers of bars separated by a far enough range so the two are not

crossing all the time. Likewise, the range should not be so great that the two moving averages never cross. A double moving average indicator may look like and have a the slow moving average over a 50 bar period and the fast moving average over a 10 bar period. Running optimization tests with the two moving averages is an efficient way to determine the past number of bars each moving average should use.

The following figure depicts a double moving average, an example of a death cross at the first arrow, and an example of a golden cross at the second arrow, with the fast moving average in cyan calculated over a 10 bar term and the slow moving average in purple calculated over a 20 bar term:

Strategies with moving averages are not limited to only using two moving averages. Another popular moving averages strategy is the triple moving average crossover or TMAC. The **triple moving average crossover** is a crossover strategy that uses of three moving averages. The TMAC strategy works on similar principles to the DMAC with an added intermediate term moving average. The advantage of having another moving average in between the short term and long term moving averages is that it increases the accuracy and strength of the trend signals; helping prevent false signals. Like the DMAC, the TMAC uses the short term moving average crossing above the intermediate term and the long term moving average to indicate a potential buy order. The TMAC uses the short term moving average crossing under the intermediate term and long term moving averages from above to indicate a potential short order.

6.3.2 Stochastic Oscillator

The stochastic oscillator strategy is a widely used support and resistance strategy. It compares an asset's closing price to its price range over a given set of bars, normally 14 bars. The stochastics indicator will tell a trader whether an asset is overbought or oversold. An overbought asset should fall in price and an oversold asset should increase in price based off of supply and demand principles. The formula for this indicator is: %K = 100 × [('market close price' – 'low of the last 14 bars) ÷ ('high of the last 14 bars' – 'low of the last 14 bars')]. %K is generally charted against the %D, which is a three-period average of %K. Normally, the indicator range for an oversold security is below 20% and above 80% for overbought. The stochastic oscillator fails when a market is trending upward or downward as a trader can receive false buy and sell signals. Using this indicator in a strategy is most commonly used on the foreign exchange market where a trader can expect the market to be moving relatively sideways. To trade this strategy, a trader would wait for a security to be either overbought or oversold, then short or buy the currency respectively. The trader would exit his or her position when the %K and %D lines cross into the other region; signifying a transition from overbought to oversold or oversold to overbought. For example, if a security's %K line crosses above 80 a trader would wait for it to cross below 80 and then shorting the security. If the signal was correct the security should drop in price until the %K line crosses below 20, when the security crosses above 20 the trader should reverse his position.

In the above picture the stochastic oscillator is on the bottom. The blue line is the %K and the red line is the %D. The green lines indicate the overbought and oversold regions. In this figure, a trader would want to buy into the asset at the first arrow and then short at the second arrow. The third arrow is a reversal point and using this strategy a trader would take a long position. This strategy rarely results in large profits; however, it is an excellent way to make a consistent amount of low percentage wins that can add up.

6.3.3 Relative Strength Index

The relative strength index or RSI is another support and resistance strategy with the overall purpose of showing a buyer when a security is overbought or oversold. The RSI values range between 0 and 100; RSI = 100 – [100 ÷ (1 + ('average of the day's closes higher than opens' ÷ 'average of the day's closes lower than opens'))]. Most traders use a value of 30 to determine when a security is oversold and a value of 70 to determine when a security is overbought.

In the figure above, prior to the blue arrow the RSI is above 70 and in the overbought area. At the arrow, the RSI dips below the overbought line, depicting a large drop in the value of the EURUSD pair. A trader using this strategy would short this pair around the blue arrow.

6.3.4   Average Directional Index

The Average Directional Index, or ADX for short, is an indicator of trend strength. It is calculated based on the moving average of price range expansion over any amount of time. The standard number of bars in the calculation of the moving average is 14 bars. The purpose of the ADX indicator is to visibly represent how strong a trend is. The stronger a trend, the more likely it is to continue. The ADX will return a value between 0 and 100 based on how strong a trend is. The ADX indicator can be used to create a strategy or added as part of another existing strategy. A trend following strategy using ADX on its own will normally use the ADX value of 25 to define a strong trend. Other uses of the indicator in strategies can be pairing ADX with support and resistance strategies as support and resistance strategies tend to fail in a trending market. An ADX value below 25 normally indicates a trendless environment that a support and resistance strategy can operate in.

6.3.5   Long Term Equity Trading

Long term equity trading requires portfolio management. A **portfolio** is a combination of assets, in the case of long term equity trading this would be stocks. Long term equity trading aims for sustainable growth and profits in the long run. Thus, large cap, dividend-paying, stable companies are appealing in long term equity trading. Oftentimes, brokers and investment gurus will recommend a diversified portfolio. **Diversification** is a method of managing risk that mixes a range of different investments within a portfolio. The purpose of this diversification is to spread out the risk and potentially yield higher returns. A common analogy used to explain diversification is the old eggs in a basket adage. Suppose there are a dozen eggs and three baskets available. If one puts all the eggs in one basket and the basket is dropped, all of the eggs are lost. On the other hand, four eggs are put into each basket and on basket is dropped, there are still eight eggs in the other two baskets. By spreading out the risk across multiple investments, the chances of incurring heavy losses on all investments from one event decreases tremendously. Some examples of ways to diversify a portfolio are to: invest in foreign securities which are not as closely related to domestic investments, invest across the markets, and investing in different sectors. A well-diversified collection of stocks in a portfolio should see increases in some stocks as others decrease. Through diversification, the goal of long term equity trading is to grow wealth steadily while mitigating risk.

7 ABRIN BERKEMEYER'S STRATEGY

7.1 PERSONAL HISTORY AND BACKGROUND INFORMATION

Prior to this Interactive Qualifying Project my experience with investing had been limited. I had knowledge about microeconomics, macroeconomics, and the stock market and tried trading equities based off of fundamental and technical analysis. Originally anticipating to create a strategy to trade equities, the project expanded my views of investing and I developed a trading strategy based around the currency market.

I developed my strategy on the TradeStation investing platform through a simulated account. The size of the account was 100,000 United States dollars.

7.2 STRATEGY DEVELOPMENT

Creating an effective strategy takes self-reflection, testing, and time. Self-reflection includes identifying a personal risk profile, a realistic availability of time, and a level of expectation during a trade. These attributes of self-reflection can be identified through trying different strategies. It may be common that the notion of a certain type of strategy may appear appealing but bears little practicality. Discerning a strategy's practicality requires testing and testing takes time.

Without having any strategies or currency trading experience to reflect on, I began my strategy development by using a support and resistance strategy. I wrote the strategy in TradeStation, with the help of Murray Ruggiero, William Brower, and Arthur Putt's book *Using EasyLanguage 9.x*, using the trading platform's EasyLanguage code. The strategy used previous highs, previous lows, and a pivot value. The pivot value is calculated by taking the high, low, and close of the previous day and dividing by three. The support was then calculated by multiplying the pivot value by two and subtracting the previous day's high. The resistance was calculated by multiplying the pivot value by two and subtracting the previous day's low.

The strategy was written to always be in the market. That is, when a long position was exited, a short position was entered, and when a short position was exited, a long position was entered. The strategy entered a long position at the market price of the next bar when the close price of a bar crossed below the support price. The strategy entered a short position at the market price of the

next bar when the close price of a bar crossed above the resistance price. The following figure depicts the entry of long and short positions generated from this strategy:

I back tested the strategy on the EURUSD and USDCAD. The back testing showed that the strategy was most profitable on five minute to thirty minute bars. Satisfied with the profitability of the back testing, I decided to see how the strategy would do in the unpredictability of the live market.

Trading the EURUSD on five minute bars with one standard lot, I let my computer run the support and resistance strategy for a week. Over the course of the week, the strategy proved to have a clear, observable failure. The strategy went short as it was supposed to when the closing price of one of the five minute bars crossed above the resistance price. The problem with the strategy arose as the EURUSD price didn't decrease enough to cross the support price and reverse positions. The price of the EURUSD continued to increase and the support and resistance prices increased accordingly. As a result, the short position continued to lose money as it was not exited and the market trended upward. The following figure depicts this phenomenon as seen in the area circled by the white oval:

I eventually manually stopped the strategy after days of accrued losses. At that point, it was necessary to reflect upon the strategy and my own expectations while trading. The strategy could be adjusted to protect against trending markets by adding stop losses. Apart from the technical analysis of the strategy I learned about my own trading style. Trading the support and resistance strategy using automated trading led to two realizations: the amount of time the strategy took to become profitable (trading on five to thirty minute bars) was too long, and entering at the next bar was too much of a delay. As a result, I diverted away from automated trading and began developing a new strategy around manual trading. Manual trading allows the trader to enter and exit a trade at any moment as opposed to the coded time frames of an automated system.

The manual trading strategy began with identifying market direction. In order to identify current market direction I started by looking at the daily bar chart. A current price lower than the open identified a downtrend for the day and a current price above the open identified an uptrend for the day. Next, I went to the four minute bars to look for shorter term direction. On a day when the current price was lower than the open, I would look for a downtrend in four minute bar charts and take a short position. Downtrends were identified and more clearly visualized by adding trend lines and resistance lines. I would place a trend line on a downtrend when there were three peaks; each lower than the last. The resistance line was placed at the maximum of the day. I used this same process with a support line at the minimum of the day and trend lines for days when the current price was above the open.

The manual strategy and the automated support and resistance strategy had many differences. As opposed to the automated strategy, the manual strategy is not always in the market. The manual trading strategy was meant to be a day trading strategy and to only trade one direction

per day. Short trades were only made on days where the current price was below the open price, indicating a daily downtrend. Long trades were only made on days where the current price was above the open price, indicating a daily uptrend.

Another more major difference between the two strategies, was taking the consideration of the effects of press releases into account while trading. Press releases such as gross domestic product reports and unemployment rates can be used to gauge the strength of an economy and currencies pairs are affected likewise. The automated strategy reacted to the movement of the currency pair being traded but had limited resources to determine market movements. Trading manually requires understanding the effects of news releases on the currency pairs being traded. For example, United States interest rate change decisions have a largely volatile effect on USD paired currency pairs and can determine direction of a USD paired currency pair over the course of days. Increased volatility and drastic market movements associated with the news can have a major impact on exchange rates during the day that a day trader needs to be aware of. With this knowledge, I used an online economic calendar to track countries' economies. Economic calendars will often rate a news event based off of expected impact on an economy. Furthermore, a good economic calendar will display the expected outcome of a statistical news release, like an unemployment rate, and compare the actual figure with the expected figure.

I traded using the manual strategy for a week before making revisions to the strategy. I started out by only trading the EURUSD to minimize the amount of economies I had to keep track of. As far as the amount of units I would trade, I decided to trade one standard lot. A standard lot at the time cost roughly 2180.00 USD on a 50:1 margin. With 100,000 simulated dollars available, I chose to only trade one standard lot as the 2180.00 USD in required capital is a realistic amount for a small time trader to deal with. Trading one standard lot of EURUSD, I profited 203.40 dollars in two days on two long trades. Both trades weathered more than ten pips of losses before becoming profitable. Holding onto a trade before the market moves in the expected direction the trade would be profitable in takes patience. I learned this lesson when I diverted from my strategy the next day eager to make more profits. Following trend analysis, I anticipated an uptrend for the day and took a long position. I entered the market during a short term drop in value and watched the trade over the five minute bars chart. The five minute bars continued to drop in value and I became anxious that I had made the wrong decision to take a long position. Fearing I had made the wrong trade, I reversed my position on the EURUSD and took a loss on the long position. In addition to reversing my

position, I decided to trade five standard lots to make up for my losses. The EURUSD proceeding to increase instead of continue to drop. Not wanting to waiver on my strategy, which at this point I had already abandoned, I held onto my short position as the EURUSD went up. I eventually bought to cover at a loss for a total loss of 2,231.00 dollars for the day.

Losses may be discouraging but losses are also an experience to learn from. Effective strategies have rules in place to mitigate losses and during a trade is not the time to change a strategy. Therefore, if a manual trader is going to watch his or her trades, the trader needs to have a grasp over patience and greed. Patience can be a key component to effective trading; allowing the market to move without becoming over anxious and second guessing oneself. Markets do not move in straight lines and being able to weather short term uptrends and downtrends can be very important. Most trades take time to be profitable and as a trader, one must be able to wait and not act on impulse. At the same rate, a manual trader needs to have a hold on greed. Making profitable trades can lead to overconfidence and overconfidence can lead to making riskier trades; trades not necessarily within the bounds of one's strategy.

7.3 FINAL STRATEGY

My strategy development process led to a final strategy before implementation. The strategy is a manual trading strategy based around following daily trends resulting from news releases. Furthermore, it is a day trading strategy designed to trade every day of the week. For simplicity, I decided to only trade the EURUSD currency pair so I only had to keep track of two economies. The strategy looks the daily bar to see which direction the market is moving for the day. I then compared the market direction with an economic calendar and associated news released to get a sense of the strength of the EURUSD market direction. Looking at the sixty minute, fifteen minute, and four minute bars, I analyzed the graphs for peaks and troughs to identify short term trends during the day. Never going against the market, I only made short trades when the market price was below the open for the day and I only made long trades when the market price was above the open for the day.

The hope with this strategy is to be able to be in and out of the market within a matter of minutes by following the daily trend. Since markets tend to oscillate in the direction they are moving, there is the possibility of a trade generating losses before becoming profitable. In such situations, I would have to not waiver on my strategy and wait for the daily trend to continue enough to become

profitable. Furthermore, it isn't known how long a trend is going to continue on for. Weary of trend reversals, I kept profits small and did not seek large winning trades.

I traded this strategy using five standard lots. Trading five standard lots required 11,300 dollars in capital to trade using a 50:1 margin in February and March of 2015. I had 100,000 simulated dollars of capital but I wanted to keep my required capital relatively low for the practicality of implementing this strategy with my own funds in the future. Trading five standard lots, the movement of one pip is worth 50.00 dollars.

My final strategy, with the efforts and learning experiences of the strategy development phase, was also shaped out of goal setting. I wanted to have a respectably profitable strategy. The investment industry standard on returns is often measured by the performance of the S&P 500 with an average annual return of 10%. The goal of implementing my strategy, if implemented correctly, was to make 100 dollars a day, or comparable profits. Profiting 100.00 dollars a day, five days a week, for 52 weeks a year calculates to 26,000 dollars a year. On a 100,000 account, that is a 26% annual return; well above the average S&P 500 average annual return. Compared to the 11,300 dollar required capital, 26,000 dollars a year in profits is a 130% annual return. These returns were ambitious and more realistically I expected to make 250 dollars a week adjusting for losing trades and time availability. Profits of 250 dollars a week would be a 13% annual return on the 100,000 account and 15% annual return on the capital required.

Trading five standard lots at a time made profiting 50.00 to 100.00 dollars a day meant I only had to cover the pip spread and make one to two pips a day. Since my strategy didn't require large pip movements to earn my desired profits I tended to trade in the early afternoon. The early afternoon was an ideal time to trade because most of the impactful news reports were released in the morning. Therefore, the morning would be a volatile time to trade but by the afternoon it was apparent how the EURUSD reacted to the news and I could follow the trend.

7.4 IMPLEMENTATION, RESULTS, AND ANALYSIS

I traded my final strategy from February 4, 2016 to March 21, 2016. Over that time period I made twenty-one winning trades for a total profit of 2,286.00 dollars. I did not trade every weekday as intended due to timing and market conditions, but of the trades I made the average trade profited 108.86 dollars and my largest winning trade profited 252.00 dollars. Furthermore, a 108.86 dollar

profit per trade was very close to my 50.00 to 100.00 dollar desired profit per trade. The following figure displays an equity curve line that shows the net profit level of each trade in addition to previous trades:
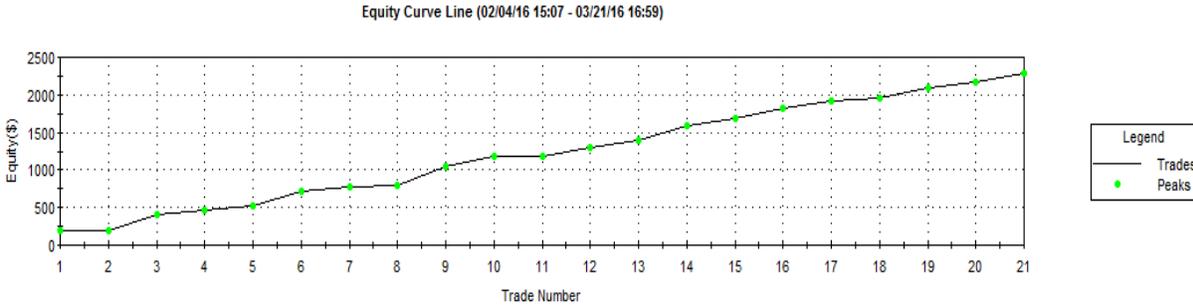
The 2,286.00 net profit in February and March is a 2.29% gain on the original 100,000 in the account. Annualized assuming similar returns for the rest of the year, the 2.29% gain in February and March corresponds to a 17.92% annual return. Compared to the 11,300 required capital to trade the strategy with five standard lots, the 2,286.00 net profit is a 20.23% gain and correlates to 160.52% gain annualized. The annualized results on the 100,000 account of 17.92% was better than I had realistically projected I was going to do. Furthermore, this annualized result was better than the average 10% annual gains of the S&P 500.

Analyzing the trades I made, I was able to identify how efficient the trades I made were. The efficiency of a trade is a percentage measurement of entry and exit points compared to the maximum profit points during the trade and the total net profit. The following figure displays the efficiency of each trade:
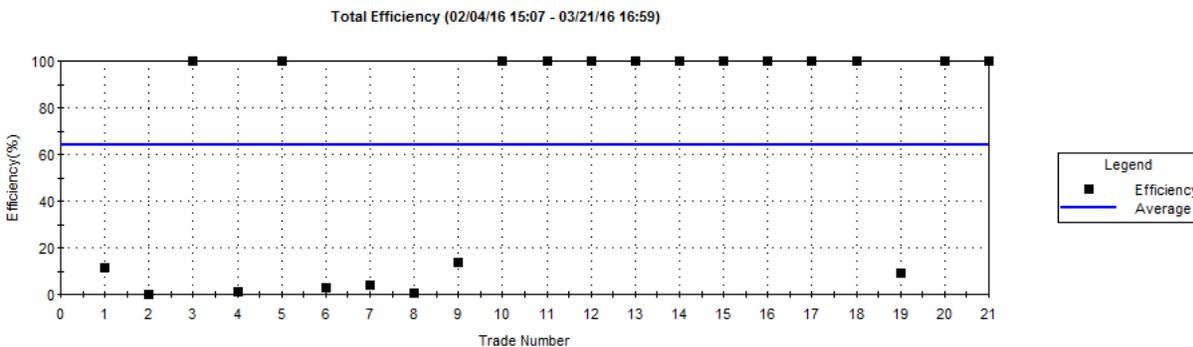
Although my trades were profitable, many of the trades had very poor efficiency levels, below 20%, when I first started trading. Low efficiency correlates to greater unrealized losses before

I made the profit on the trade. The more experience I gained trading, the better my trade efficiency became and less unrealized losses I had before profits were achieved. As seen in the figure above, the second half of my trades almost all had a 100% efficiency.

All the trades I made with my final strategy were profitable, however it is important to look at the results from the strategy development phase in addition to the final strategy implementation because the strategy development phase molded the final strategy. The figure below depicts the complete equity curve from both phases:
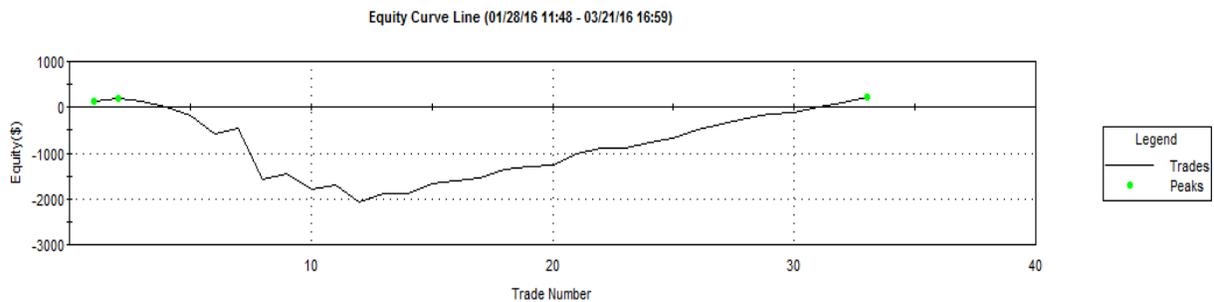
Over the course of the project I made a total of 33 trades. It took several losing trades for me to fine to my strategy before becoming profitable. With 78.79% profitable trades, I only barely broke above even from my losses in the developmental phase through the implementation of my final strategy. My early substantial losses are a key advocate trading a simulated account before investing with real money. It takes time, experience, and scientific analysis to construct a strategy that one can be confident in and trade when the stakes are real.

8 JACOB BILLINGTON'S STRATEGY

For my portion of this project, I focused mainly on support and resistance strategies in the foreign exchange market. In addition, I made some long term trades in the equity market.

8.1 FOREIGN EXCHANGE STRATEGIES

I chose to focus on the foreign exchange market for several reasons. Mainly, it is much less costly to invest in currencies as there are not commissions for trading currencies and opening a foreign exchange trade account can cost as little as 50 dollars. Another reason, is the fact the currency market is relatively stable; changes of more than even one percent are rare, while the equity market can be far more volatile. The currency market further appealed to me because I love to follow current events and international events, which can be a driver of exchange rates on the market. The main risk of the market remained with the ability to buy and sell on margin. This amplifies the risk and means that one percent change can result in far more in losses or gains.

The first strategy I used was a stochastic oscillator strategy. This strategy worked well for me and taught me a lot about programming and strategy implementation. The strategy is detailed specifically under the 6.2 Indicators and Strategies section of this paper. I first used the stochastic oscillator as a completely automated system that bought and sold on its own. This exposed to me to one of the larger pitfalls that many system designers fall into, curve fitting through over optimization. When an automated system is written in TradeStation, the writer has the ability to back test it and run the system over the past day, week, month, year, or any other time period to see how it would have worked. While back testing, one can optimize any or all of the variables in a program, which allows a trader to see which combination of values results in the largest gain over the period being tested. When I first began trading this strategy I immediately began to optimize every single variable which resulted in outrageous profits; sometimes I made over 100% in just a single week. This meant one of two things, either I found the most successful strategy ever and could now retire, or I had very unrealistic results. When I allowed the strategy to trade on the live market over the next week with the same values that I had optimized, I quickly realized the latter was true. Some currency pairs resulted in modest gains and some resulted in excessive losses. After this trial period, I settled on using generic variable values that allowed for modest gains on most currency pairs.

After deciding on those values for the stochastic oscillator, which were 80 for overbought and 20 for oversold, I began examining the results of my strategy to determine potential pitfalls that could be holding back my profits. My first realization was that I had losses whenever a currency pair began to trend. To counter this, I included an RSI indicator into the strategy that worked hand in hand with the stochastic oscillator to prevent trading in trending markets. My new strategy demanded that the RSI value be between 40 and 60 before it would trade. This strategy was effective as the RSI values were determined from the value over the course of the daily bars while I used five minute bars for the stochastic oscillator. The result was that if the RSI did not indicate overbought or oversold then the long term trend was unlikely to change, meaning a more sideways market. This was an improvement on my previous strategy but still did not prevent enough losses over trends and sudden changes in the market.

My next strategy converted my previous one from an automated strategy to a system of indicators that allowed me to manually trade. This seemed like the best answer to my previous problems as it allowed me to work around news stories and stay out of the market whenever I felt it would be too volatile. This brought me success and in my most successful week I was able to make twenty percent which is a dream week for a trader. It also exposed me to a host of pitfalls. The first among them was my attention to the strategy. In the normal investing world a trader can devote his entire attention to his or her system, this is not reasonable as a college student with classes and activities to attend. Several times I opened a trade and had to make a choice between closing my trade before my system told me to or risk missing the close signal while I was away from my computer. This was something I struggled with for a majority of my time, however I was able to clearly see what my profits would have been had I been able to be a full time trader and the system averaged two percent per week, which is very efficient.

In my next iteration of the stochastic oscillator strategy I replaced the RSI indicator portion with an ADX indicator which is more suited to indicating trends. With this system I would only trade if the ADX was below 25 which indicated a trend free market. Using this system I was able to continue my 2% per week but trade a little bit more confidently. With this system I would only trade if the ADX was below 20 which indicated a trend free market. Using this system I was able to continue my 2% per week but trade more confidently.

In the figure above one can see this strategy in action. Following my strategy from the first blue line, I would watch for the ADX, which is the bottom graph, to be below the trend value of 20, and the stochastic in the middle graph to be above the overbought value of 80 and crossing below, at which point I would short the currency pair. I would then wait for the stochastic to cross from below the oversold value of 20 to above, marked by the second blue line, to exit the trade with a buy to cover exit. Following this strategy I would only exit the trade and not reverse my position as the ADX has now crossed above my trend value of 20. Making this trade would result in a profit of approximately seven pips. The final adjustment to this strategy was a counter. I created a program that would only indicate a buy signal if the ADX was below the trending line for more than a set number of bars. This would indicate that a currency was not trending for the last ten bars and should be a good time to enter a trade.

Another strategy I tried to use was trading based on news stories. Many websites offer an economic calendar for the week that can indicate how a currency pair might move. For example, I did not predict the jobless claims report week of February 20th but I was watching the jobless claims report to see how the market would react. In the previous week the unemployment rate was down however some research into how the unemployment number is calculated made me feel that the

jobless claims would be far higher than expected. This proved to be correct and had I shorted the USD, I would have made several pips correlating to profits.

Investing based off the news ended up being a more costly strategy than I had anticipated. It is very hard to predict how a currency pair will react regardless of how good or bad the news may be for a given economy. I tried several different strategies. The first was to try and predict the outcome of a news release. After mixed success with this strategy I decided I would wait until the news was released and immediately enter the market based on the result. This worked slightly more efficiently but still had very unpredictable results. Finally, I decided to wait until a market began to trend before entering and try to ride the resulting wave. This strategy was still much riskier than I cared to invest in and I determined that I should stay with the stochastic oscillator strategy as it was lower risk and I had far more success with it.

8.2 EQUITY MARKET TRADING

I also invested in several companies in the equity market. My first investment was in Alphabet Inc. (ticker: GOOG). This trade was made in my first week with TradeStation and entirely based on intuition. I held this trade for the entirety of the term of the school year and sold with a profit of 8%. Had the project not ended I would have continued to hold the security as I expect the value to continue to rise.

My next investment was in Chipotle (ticker: CMG). At the end of 2015 Chipotle received severe backlash over news stories indicating that customers were made sick by the food. This backlash continued into early 2016 causing the stock price to fall almost 45% until Chipotle released that they were changing how food was prepared and stored in an effort to reduce the likelihood of contamination. On top of this, it was announced that Chipotle still planned on opening 250 stores in 2016. With all of this knowledge I assumed that Chipotle would bounce back and I took a long entry in the stock on February 2nd. Within a week I had lost 10% on my initial investment as the price continued to drop. However, in the following week the price began to climb and soon after I was making a profit. On March 9th it was released that a Chipotle store in Billerica, Massachusetts had reports of a customer getting sick and the stock dropped immediately. I was able to get out quickly enough that I still made a 20% profit. The stock continued to fall and had I failed to exit I would have lost almost 75% of my profit.

My final investment was a short entry in VirnetX Holding Corporation (ticker: VHC). This company won a major lawsuit against Apple Inc. in early February, 2016. After fundamentally examining the stock, I shorted the security with the assumption that this stock was severely overbought solely because of this lawsuit would not result in long term success of the company. I was soon proved correct as the stock dropped about 20% in the following days. After holding the stock for a month, I bought to cover for a final profit of 26%.

8.3 RESULTS

The following are the results of 1 year back tests of the different automated strategies I produced over the course of the project. The realized equity curves give a visual representation of the trade history my strategies would have produced over the past year if they were traded and the tables give some trade analysis.

Basic Stochastic Oscillator:
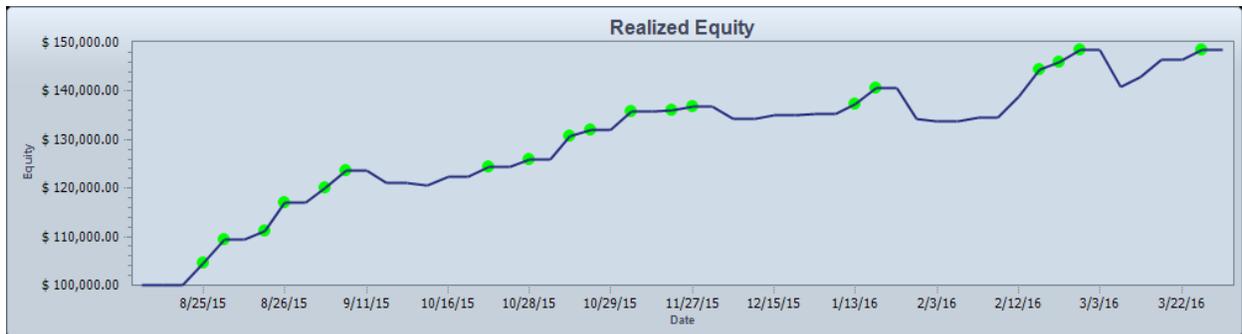
Summary	Value
Total Return	$29,319.29
Total Realized Return	$48,597.78
Gross Profit	$68,551.16
Gross Loss	-$19,953.37
Open Trade P/L	-$19,278.49
Number of Trades	34
Number of Winning Trades	26
Number of Losing Trades	8
% Profitable	76.47%

This strategy is available directly from TradeStation and shows that even the most basic strategy can be productive. This is the starting point for all my other strategies. It earned approximately 50% over the course of the year. It currently has a position that is worth -$19,278, which indicates this strategy got caught in the wrong position on a trend. Future iterations deal with trends.

Stochastic Oscillator and RSI:

Summary	Value
Total Return	$51,594.01
Total Realized Return	$50,535.79
Gross Profit	$247,977.15
Gross Loss	-$197,441.36
Open Trade P/L	$1,058.22
Number of Trades	669
Number of Winning Trades	388
Number of Losing Trades	281
% Profitable	58.00%

This strategy worked very well for me while live trading and over the course of a one year back test made approximately a 50% profit which is very high risk. It won 58% of the trades it entered which leaves much room for improvement. I would upwards of 66% profitable trades. However, it does deal with trends slightly better as it does not enter or exit a trade during a trend. The RSI is meant to identify over-bought or over-sold conditions and not trends as it is being used here. In the next iteration I replaced the RSI with an ADX indicator.

Stochastic Oscillator and ADX:

Summary	Value
Total Return	$30,764.67
Total Realized Return	$30,917.43
Gross Profit	$501,475.13
Gross Loss	-$470,557.70
Open Trade P/L	-$152.76
Number of Trades	3,794
Number of Winning Trades	2,384
Number of Losing Trades	1,405
% Profitable	62.84%

This strategy was my first strategy using the ADX indicator in conjunction with the stochastic oscillator. It is a high risk strategy as the strategy's gross profit is about 500% with a gross loss of 450%. These are very unreasonable numbers. Approximately 60% of trades are profitable however and the strategy makes a 30% profit over the course of the last year which is far above average. This strategy is probably too risky to be used as an automated system. However, when used as an indicator with the trader making a decision on whether the signal is true or false, it can be much less risky.

ADX Counter:

Summary	Value
Total Return	$11,784.47
Total Realized Return	$11,784.47
Gross Profit	$35,940.41
Gross Loss	-$24,155.94
Open Trade P/L	$0.00
Number of Trades	253.
Number of Winning Trades	169.
Number of Losing Trades	84.
% Profitable	66.80%

This is the ADX counter strategy. This strategy would only invest if the ADX was below a given value for a certain number of bars. In this case the ADX value was 15 for a total bars. It resulted in a 10% profit over the course of the year and won 66% of trades. Another benefit of this strategy is that it is lower risk than previous iterations. The gross profit and gross loss were both reasonable numbers as compared to previous strategies. I would use this strategy as an indicator of ideal purchasing conditions if I were to continue trading currencies.

9 KIERAN COCHRANE'S STRATEGY

During the course of this IQP I experimented with a few different strategies applied to the foreign exchange market, both automated as well as manual, before settling on my current strategy of trading based on report releases.

9.1 STRATEGY DEVELOPMENT

At the beginning of the project I believed that I would enjoy writing a program in TradeStation with EasyLanguage and then sit back and watch the program make money. The first program I wrote was a daily trend following program that used a moving average based on the last 70 bars at the closing price. If the bar crossed one point above the moving average, a buy order was placed at the current market price. The idea of this buy order was that if the market was trending, the bars would continue to stay above the moving average and the profit would increase. The exit strategy was that if the bar dipped one point below the moving average, a short order would be placed on the next closing bar. A profit would be made in the gap between the closing bar where the exit was triggered and the short at the next close. The purpose of this strategy was to always remain in the market in an effort to maximize profit.

I applied this trending strategy to the EURUSD and EURCAD and experimented with the input of the number of bars that determined the moving average. I also changed the interval for the trades from two minute, five minute, and sixty minute bars to see which combination of interval length and number of bars would provide the most profit. I noticed that the sixty minute interval needed less bars to calculate a moving average that made the strategy profitable compared to the two minute and five minute intervals. The results of back testing are shown in the table below:

Interval (minutes)	Length of Bars	Percent Profitable (%)
60	70	100
5	115	50
2	155	50

The sixty minute bars contain the most accurate information, and with that information a more accurate moving average was created. With this more accurate moving average, the buy and short functions of the trending program were triggered at times that were more appropriate with a significant decrease in the chance for a loss. This is why it was more profitable when compared to the results of the trending program on the two minute and five minute intervals. With this realization I kept the strategy running on the sixty minute interval as well as the five minute interval so that I could see if the five minute interval was able to pick up on some of the trends that the sixty minute interval found. The five minute interval did not find any of the trends found on the sixty interval as its moving average was based on an overall shorter time frame and did not include enough data to form a moving average as accurate as the sixty minute.

While I had figured out which intervals and numbers of bars worked the best, I was still losing large amounts of money. This loss was due to a couple of factors: the program was in the market too often and I manually overrode some of the trades. I designed the program to always stay in the market with the exit strategy for a buy to be a sell and then short, and the exit for a short to be a buy to cover and then a buy long. This created significant losses as I did not place any sort of safety net to stop the program from running when the market was trending sideways. When the market was trending sideways, the program continued to buy and short based on the moving average because it believed the market was still trending upward or downward. It would make consecutive overlapping trades so that I would be holding two or three standard lots at a time, all longs or shorts depending on when it was triggered, until the moving average started moving in the opposite direction. If I had applied individual exit strategies to the two triggers in the program, I would have been able to prevent the programs activity in the market during a sideways period. One of the exit strategies I could have implemented to solve the problem would be a stop loss exit which is calculated through profit per positions and set a dollar amount or percent of the initial investment willing to be lost.

For the second factor contributing to losses in my program, I was manually taking control of the program when I didn't believe it was functioning properly. When I first started running the program, I saw that it was exiting too soon on occasion and losing out on a greater profit. With this in mind, I began modifying some of the trades it made by turning off the program after it bought or shorted a standard lot. An example of this human error was the very first trade I made with this program. On November 11, 2015 the program entered long on one standard lot of EURUSD and

instead of trusting the program to function and sell for what would have been a small profit between ten and sixty dollars, I decided to turn it off and hold the position for a longer time. I held it for almost two weeks before I finally came to realize that there was no chance of it returning to the price I had bought it at, much less go higher. As a result, I sold on November 30, 2015 and took a loss of 878.40 dollars. After this user interference, I left my program be to do what I designed it to do with only one other time to step in. On December 7, 2015 the program entered long with one standard lot on the EURCAD at a value of 1.47. Again, I made the decision to step in because I thought it would increase more than the program would catch. In this case I made the right decision as I sold at a value of 1.51 on December 18, 2015 with a profit of 2,937.20 US dollars.

Through the use of this trending strategy I became familiar with the TradeStation platform and EasyLanguage. I found that the best way to use an automated strategy is back test it before implementing it and then monitoring it as it is live traded. As a strategy is live traded one can see every trade that is made and compare these trades to the strategy's parameters to ensure that it is doing what it was created to do. If it is not, one can find the problems through the analyzation of the trades list for the trades that were made at an improper time or outside of the bounds of the parameters believed to be correct. After the realization of the problems with the strategy, editing the program to fix the problem becomes much easier whether it is adding a stop loss or adding more indicators or parameters to ensure that the program is doing exactly what it is intentionally designed to do.

The next strategies that I used were an expansion upon moving averages. I used two moving average programs through TradeStation in tandem on the foreign exchange to see if they could do better than my initial daily trending program based off of the single moving average. I continued to trade positions with long and short entries, but used multiple moving averages to trigger the orders.

One of the new moving average strategies I used was a two line moving average short entry crossover. This strategy uses two moving averages, a fast and a slow, to trigger a short entry order. When the fast moving average crosses below the slow moving average a short entry order is placed. This crossover indicates a downward trend and is more accurate than the one used in my daily trend strategy as it is calculated using two moving averages meaning that an order is less likely to be triggered by a false downtrend. Since there is no exit written into the program I decided to use the two line moving average long entry crossover strategy. The long entry strategy works the in the same way as the short entry strategy with the fast moving average crossing the slow moving average. The

difference in long entry case however is that the long order is triggered when the fast moving average crosses above the slow moving average indicating an upward trend. By using both of these strategies simultaneously, I was always in the market every time the fast moving average line crossed the slow line whether it crossed above or below. If I had a long position and the fast line crossed below the slow, a sell order was placed and then a short order on the next closing bar. Likewise, if there were a short position and the fast line crossed above the slow, a buy to cover order was placed followed by a buy order on the next closing bar. The profit was made in between the sell or buy to cover and the gap of the close of the next bar before the long or short order was placed.

I implemented this system on the EURUSD, USDJPY, EURCAD, USDCAD, and the EURCHF to compare how it would do with each currency pair and to see which currency pair trends the most as moving average strategies work best with trends. I also decided to trade more lots at a time to increase profit as well as used the strategy on five minute and sixty minute bars. My goal was to determine the currency pair that tended to trend the most and the optimal bar range to trade it. My estimate was that the sixty minute bars would work best as it performed best with a single moving average and so I assumed that this would also be the case with two moving averages because these moving averages would be calculated using more stable data.

For my third strategy I decided to stay away from automated trading as the strategies that I was using were not very successful. Instead, I took the approach of manually trading currencies based off of the releases of the economic reports. Since so many different economic reports come out every day that deal with employment rates, credit rates, big bank decisions, bond rates, and basic economic activities in the world, I wanted to find the reports that moved a currency pair the most.

After doing some comparison research between report releases and the bar charts around the corresponding times using an economic calendar, I found that currency pairs typically move a large amount due to three different report types: employment reports, economic activity in the world, and the decisions made by central banks.

Employment reports include the US Initial Jobless Claims report which is released every Thursday at 9:30 AM, the US Unemployment Rate which is released once a month, and Non-Farm Payroll which is released once a month. The US Initial Jobless Claims report is a report of the amount of people who have filed for unemployment insurance for the first time that past given week. When this number is higher than the previous it is a sign that the US economy is weaker as

there is a higher number of unemployed citizens with the impact being a decrease in the value of the USD. When the number is lower than previous the effect is the opposite, as more citizens are being employed meaning that the consumers will have more money to spend resulting in an increase in the value of the USD. The US Unemployment Rate is the monthly percentage of the total work force that is unemployed and seeking employment. Non-Farm Payroll records the change in number of people employed during the previous number, not including the farming industry. The creation of jobs indicates a direction of consumer spending which is accountable for most of the economic activity. When the payroll results are higher than the previous month and the expected outcome for the current month, the value of the USD increases.

Economic activity reports include reports such as New Home Sales, Existing Home Sales, Building Permits, and Retail Sales. The New Home Sales report measures the number of new single-family homes sold in the previous month. When this number is higher than the previous number or better than expected, the value of the USD increases as more Americans are purchasing new homes meaning that the economy is doing well as citizens have spending money. The Existing Home Sales report records the number of existing residential buildings that were sold during the previous month and is a good indicator of how well the housing market is doing. Like the New Home Sales report, higher numbers mean the economy is doing well and the USD increases in value. The Building Permits report is the number of new building permits issued by the US government and is key to determining the demand in the housing market. Again, the Building Permits report is the same as Existing Home Sales and New Home Sales in that when the number is higher than previous or better than expected the value of the USD increases. The Retail Sales report measures the change in the total value of sales at the retail level and is considered the foremast indicator of consumer spending. When this reading is higher than expected, the USD increases in value as it is an indication that the US economy is doing well.

The central banks are the third type of report that impacts currency pairs. The central banks discuss and determine interest rates as well as their leaders giving speeches about the current state of the global and regional economies. An example of determining an interest rate, is when the US Federal Reserve decided on an interest rate of 0.5% on March 16, 2016. This rate was the same as the expected and the previous rate, resulting in about a 70 pip increase for the EURUSD which translates to 700 dollars trading one standard lot. Even though the interest rate did not change at all, its release created speculation that the US economy was not doing well resulting in a short decrease

in the value of the USD. Like the interest rates, important figureheads of these central banks also have an impact on the currency pairs. When leaders such as President Draghi of the European Central Bank and US Federal Reserve Chair Jannet Yellen give talks or speeches about the state of the economy or releases information regarding recent meetings, the currency pairs mentioned in the speeches or information tend to move a large amount. An example of this effect is shown on March 29, 2016 for the EURUSD. Federal Reserve Chair Yellen spoke at 11:30AM about the recent decision on March 16th to keep the interest rate at 0.5%. From 11:30AM to 4:00PM the EURUSD rose 107 pips with a rise of 54 pips from 1:00PM to 2:00PM alone. Because the interest didn't change, speculation that the US economy was not doing well was the result and Yellen's speech supported the short devaluation of the USD helping cause this tremendous rise in the EURUSD pairing in under six hours.

With these connections between the reports and how they affected the currency pairs in mind, I began trading based off of these report releases. I started by waiting until the reports were released and then at least another twenty minutes before placing a trade so that I could see the direction the pair was headed in. I used this method on the 3rd of March 2016 when the ISM Non-Manufacturing PMI report was released at 11:00AM. I waited until almost 12:00PM to make sure the EURUSD was going down as I expected. When I saw that it was I placed a short order and when I had a profit of over $100 I bought to cover. Even though this method of waiting worked, I wanted to see if I could make a larger profit by entering the market earlier so I would read the speculation about the reports prior to their release and I made trades fifteen to thirty minutes before the release in order make a larger profit because I was confident that the report would be the same as I speculated. I learned that trying to predict the outcome of a report was a bad tactic as I lost 378 dollars on the 16th of March 2016 because I entered the market in the morning before the release of the interest rate decision with two short positions because I thought that the new interest rate would strengthen the value of the USD causing the EURUSD pairing to drop. If I had waited until after the rate was released, I would have seen that the speculation was a weakened USD and a rise in the EURUSD pair.

From these trades I found that the best strategy out of the three that I used was trading the currency pairs by basing trade decisions off of the release of reports. During the time of the release of large impact reports that I discussed earlier which includes economic reports, central bank decisions, and employment reports, the currency pairs are the most volatile with the opportunity for

profit being maximized. In a very short time one can make thousands of dollars by using these reports as their indicator for making a trade.

9.2 RESULTS

The first strategy that I used offers advantages in a market that is clearly trending up or downwards because the moving average line is based off of these consecutive bars. I used this strategy over the course of one month and had an overall net profit of -$118 with a percent of profitable trades at %23.81. The losses of long and short trades were both great, but the profits for short trades were significantly less. This was due to the fact that a short order was placed when the bar was one point below the moving average, but often the bars would go back up as opposed to the downward trend suggested by the moving average. This resulted in the short position staying in the market until the bars crossed down to the same point for a true downward trend before going back up to be triggered with a buy order. This reoccurring false trigger resulted in the $4,129.20 net loss due solely to short trades. The same false triggering occurred with the long trades, but since the overall trend during the time the program was running was upward, it resulted with a gross loss of $3,198.81 and a net profit of $4,010.40. The entire performance summary table is listed below:

	All Trades	Long Trades	Short Trades
Total Net Profit	($118.80)	$4,010.40	($4,129.20)
Gross Profit	$7,435.41	$7,209.21	$226.20
Gross Loss	($7,554.21)	($3,198.81)	($4,355.40)
Profit Factor	0.98	2.25	0.05
Roll Over Credit	($5.94)	($26.74)	$20.80
Open Position P/L	$0.00	$0.00	$0.00
Select Total Net Profit	($969.35)	$98.45	($1,067.80)
Select Gross Profit	$2,211.71	$1,985.51	$226.20
Select Gross Loss	($3,181.06)	($1,887.06)	($1,294.00)
Select Profit Factor	0.7	1.05	0.17
Adjusted Total Net Profit	($2,089.42)	$2,075.85	($4,771.39)
Adjusted Gross Profit	$6,178.60	$5,705.99	$160.90
Adjusted Gross Loss	($8,268.02)	($3,630.14)	($4,932.29)

Adjusted Profit Factor	0.75	1.57	0.03
Total Number of Trades	147	78	69
Percent Profitable	23.81%	29.49%	17.39%
Winning Trades	35	23	12
Losing Trades	112	55	57
Even Trades	0	0	0

For my second strategy using the 2 moving averages crossing over, I encountered similar problems as with the first strategy with the program being tripped with false triggers. Below is a table detailing my findings of the currency pairs, their percent profitable, total profit for that currency pair and the number of trades made with that pair:

Currency Pair	Percent Profitable Trades	Total Profit (in USD)	Total Number of Trades
EURUSD	47.37%	-10,193.61	76
USDCAD	6.03%	-4,205.86	116
USDJPY	30.56%	-7,954.05	36
EURCHF	50%	-26.73	2
EURCAD	7.97%	-329.37	138
All Pairs Combined	17.93%	-22,709.63	368

Based on these results I found that the EURUSD tended to trend the most as I had an almost 50% profitable trades with it. The mistake I made with this strategy was that I was trading multiple lots at a time over a short time frame as the majority of the trades were made based off of 5 minute bars. The problem with this was similar to that of my original trending strategy with one moving average in that both strategies were triggered with false movements. With this strategy being triggered by the crossover of the two moving averages, the false trigger came from small crossovers back and forth which is typical in a market that is currently trading sideways. Due to the fact that I was trading a couple lots at a time, these small crossovers resulted in many small losses. An example of this is shown in my trades list for trades 9-18 on the USDJPY. In a little over 24 hours my strategy lost $704 because the program continued to make trades every time the moving averages crossed over. These multiple crossovers could have been prevented if I had inserted an exit strategy to disable the strategy when the market was trading sideways. Another solution would have been to

put a delay in before an order was placed so that the program waited two or three bars after the moving average crossover before placing an order. This delay would have prevented a false trigger as there would be time for the moving averages to create a clear picture of the direction.

Overall, this strategy was not ideal for the FOREX as most currency pairs do not trend upwards or downwards very frequently or for long time periods. A way to make this strategy better would be to implement a stop loss as well as extending the amount of bars after a crossover before the order is placed to prevent any false triggers.

	All Trades	Long Trades	Short Trades
Total Net Profit	($22,709.63)	($12,112.24)	($10,597.38)
Gross Profit	$16,497.39	$953.95	$15,543.44
Gross Loss	($39,207.02)	($13,066.19)	($26,140.83)
Profit Factor	0.42	0.07	0.59
Roll Over Credit	$151.40	($5.60)	$157.00
Open Position P/L	$0.00	$0.00	$0.00
Select Total Net Profit	($9,444.32)	($5,160.59)	($4,283.73)
Select Gross Profit	$11,532.70	$953.95	$10,578.75
Select Gross Loss	($20,977.02)	($6,114.53)	($14,862.48)
Select Profit Factor	0.55	0.16	0.71
Adjusted Total Net Profit	($27,003.93)	($13,457.22)	($14,951.48)
Adjusted Gross Profit	$14,466.70	$750.56	$13,200.18
Adjusted Gross Loss	($41,470.63)	($14,207.79)	($28,151.66)
Adjusted Profit Factor	0.35	0.05	0.47
Total Number of Trades	36800.00%	15300.00%	21500.00%
Percent Profitable	17.93%	14.38%	20.47%
Winning Trades	66	22	44
Losing Trades	300	131	169
Even Trades	2	0	2

With my final strategy I found the greatest success as my trades were 25% profitable. The greatest losses came from long trades that I made before the release of the report and held on to without a stop loss believing that the market would turn in my favor. After making the mistake of

trading before the reports were released and basing those trades on speculation and holding these positions long term, I learned that the key to earning a profit with report releases is to wait after the release and trade with the direction of the market and exiting before the currency pair returns to its normal sideways pattern. Below is a performance summary report of this strategy:

	All Trades	Long Trades	Short Trades
Total Net Profit	($927.96)	($655.96)	($272.00)
Gross Profit	$396.00	$290.00	$106.00
Gross Loss	($1,323.96)	($945.96)	($378.00)
Profit Factor	0.3	0.31	0.28
Roll Over Credit	$0.00	$0.00	$0.00
Open Position P/L	$0.00	$0.00	$0.00
Select Total Net Profit	($927.96)	($655.96)	($272.00)
Select Gross Profit	$396.00	$290.00	$106.00
Select Gross Loss	($1,323.96)	($945.96)	($378.00)
Select Profit Factor	0.3	0.31	0.28
Adjusted Total Net Profit	($1,748.48)	($1,418.94)	($645.29)
Adjusted Gross Profit	$115.99	$0.00	$0.00
Adjusted Gross Loss	($1,864.47)	($1,418.94)	($645.29)
Adjusted Profit Factor	0.06	0	0
Total Number of Trades	8	5	3
Percent Profitable	25.00%	20.00%	33.33%
Winning Trades	2	1	1
Losing Trades	6	4	2
Even Trades	0	0	0

After an analysis of all three of the strategies that I implemented over the course of this IQP, the strategy of trading the FOREX based on major report releases was the most profitable at 25%. I am confident that from my findings I will be able to carry this strategy into live trading and increase my profits significantly as I now am aware of how different reports affect the currency pairs and when to enter and exit the market.

10 MATTHEW PUKSTA'S STRATEGY

10.1 EQUITY TRADING AND PORTFOLIO MANAGEMENT

In early January of 2016 the second largest economy posted its slowest growth in 25 years. At 6.9% GDP growth the Chinese economy's shrinking growth stirred fears of a second global recession. The Chinese contraction, paired with the public perception of a weak United States job market, created a particularly volatile January in United States markets. The first week of January alone saw an eight hundred point drop in the Dow Jones Industrial Average. Combining weak foreign markets with domestic volatility and a deeply depressed oil value creates a uniquely challenging investment market.

Normally, when a market is very volatile it is characterized as trading horizontally. As a result, the market isn't making any true gains or losses. Instead, it continually fluctuates around a median line. Looking at the DJIA in January and February of 2016 as an example, the market dropped by nearly a thousand points in this time period and recovered to within one hundred points from where it initially started at the beginning of January. In times like this there are realistic strategies to implement: short-term trades or long-term investments. I chose the latter option and made long-term investments during C-term; January to March. High-volume, short-term trading requires a large amount of oversight and time commitment not necessarily readily available on a day to day basis.

With the DJIA down nearly a thousand points going into C-term and the world economic output looking bleak, the task became finding strong, positive earning stocks poised for a comeback. Such a task which requires knowing a section of the market particularly well and knowing when an investment is prime for a revival. The first step in finding what kind of investment is worth buying; options, stocks, futures, or currencies.

Once the type of investment has been determined the question is what specifically in the market is worth investing in. There is a glaring difference between saying "I'll invest in commodities" and "I want to invest in mining commodities". To understand why, the market needs to be recognized as a fluid and changing organism; any discussion here on the validity of an

investment may already be outdated in a day, week, month, or year. Thus, the specific reasoning for why each investment was made will be explained per situation, per investment.

After the target market and specified sector of the market are determined, the final necessary step is to pick the actual investment. In stock markets, this would mean companies, in currencies it would mean the specific currency pair.

Finally, after a handful of possible investments are picked out, the investor must determine what kind of portfolio he or she intends to build. Conventional wisdom governs that the younger a person is the more ambitious his or her portfolio should be as time dilutes short-term volatility. Considering the average age of our IQP group is 20 years old, there is warrant for a more aggressive portfolio assembly. With this in mind, the portfolio strategy I used was aggressive and speculative, betting on large gains in a very specific portion of the market due to the presidential election cycle.

Presidential elections bring debates, change, and promises. Promises of budget cuts, new weapons contracts, tariffs, and anything else that a candidate believes will inspire his or her constitutes to come out and vote, are made. Many of these promises have unexpected side effects on the markets. For example, the coal market saw changes during the 2008 presidential campaign. President Obama had promised to wage a war on coal if elected. His opposition, Senator McCain, campaigned heavily against this so called proposed "war on coal" in both Ohio and West Virginia, promising to end the war on coal. He promised to continue using the cheap fuel at electric plants and to ease the regulations on foreign exports of coal. In response, many of the coal mining districts did vote for McCain and the price of coal shot up steeply. The market was speculating that if he won the election, the US domestic usage of more coal would drive the price of coal up and continue growth in the market. Coal prices going into 2008 were just below three dollars per million BTUs. November of the same year, when it appeared McCain would win and end the war on coal, the price was more than doubled, peaking over six dollars per million BTUs. Immediately following the election the coal market began to collapse, plummeting back down to the mid two dollar range. This phenomenon can be witnessed in more than just coal; firearms are another prime example in election years.

In 2011, leading into the presidential elections, a bill was drafted in the United Nations (UN) that would limit the buying and arming of populaces within UN countries. The conservative media began touting it as an attempt by the Obama administration to seize firearms from the American

citizens. Paired with comments by Obama and candidate Hilary Clinton saying that they wanted to ban new firearm sales if elected drove sales of firearms through the roof. The threat of new restrictions drove firearm sales up and firearms sales quadrupled in 2012. This same scenario also happened in 2008 with the McCain-Obama election year, and to a smaller degree in 2010 and 2014 midterm elections. During the midterm elections, it was mostly due to Obama threatening to sign executive orders on firearm sales and regional elections with candidates campaigning against new firearm sales. Regardless of political leaning, it is impossible to deny that elections cause a run, or increased demand, on firearms, and if a manufacturer is well positioned it is practically impossible to not do well when there is a run on their product.

Runs on companies' products in general are easy to exploit if they are identifiable. Buying into an asset as a run begins can create fast sizeable gains. However, most people only see the run after the fact when it has begun to plateau or peaked and turned back down. To the experienced investor runs can be identified early. As with the coal speculation and the run on firearms in election years, gold is an asset commonly affected by runs. Gold is perhaps uniquely alone when it comes to commodities. Gold does not trade like other commodities and is the representation of the world's fear index, meaning that as economic outlooks worsen gold is more frequently speculated to protect wealth. The most obvious example of gold speculation is during the 2007 global recession, gold rocketed as the property bubble broke, interest rates were floored, and the market tanked. Gold, approximately 600 dollars in 2007, rocketed to 1800 dollars by the peak of the recession crisis in 2011. Gold has been, once again, making a climb due to the sagging Chinese economic data in the first quarter of 2016 and gold has risen 150 dollars.

Despite wanting to profit off of expected runs on election year industries and the fact gold should rise, this would make a portfolio significantly riskier than it should be. To be exclusively concentrated on risky speculative stocks would perfectly exemplify the adage of "eggs in one basket". To balance this problem out a handful of other stocks would need to be added to the portfolio. Stocks from other sectors that are projected to do well over the course of the year. Betting on election year speculation is not a common strategy and because of that it adds more risk. The simplest way to offset this risk is to add stocks that are popular in the market.

The final major piece of economic background that warrants discussion is China. As the world's largest consumer of raw materials and largest production based economy, China has the capacity to shape the markets. For example, in 2015, the Chinese began cutting back on oil

consumption world oil prices plummeted. The reason being was their contraction in their economic growth. An important aspect to understand about China though is that China rarely, truly contracts. Whereas sometimes the United States economy will post negative GDP growth numbers; China does not. China merely posts smaller growth numbers and they still dwarf United States growth. However, this time China has contracted drastically as it attempts to restructure its economy. China is attempting to move away from being the global factory and move to an economy more structured like Europe or the United States. This caused Chinese exports to fall by 25.4 percent in 2015. In response to this, the Chinese Premier Li Keqiang marked 6.5 percent growth annually for the next five years as his government's goal. Despite all the doom and gloom though, there is a chance that as the Chinese contract they may slow their economic conversion. The Chinese are also aware of the threat the Trans-Pacific Partnership trade union poses to them to create a tariff free, anti-China trade zone.

After considering the economic data I presented it should be relatively obvious what some of the stocks and commodities I purchased were. Firstly, I bought gold on January 18th. Gold at the time was 1091.5 dollars an ounce, which would quickly rise in price as the Dow Jones plummeted due to the contraction in China. This partnered with the low interest rates and a fear that wealth could be lost in the stock markets drove the price of gold up. After watching the market fall by 600 points in the previous week the order was filled for 30 ounces of gold at the opening of Monday, January 18th. Gold prices as of March 8th went up to 1267.13 dollars an ounce. The price of gold would continually defy expectations as what was predicted to be just a weekly or monthly bump continued well into March. Looking forward, past the early months of 2016, gold makes for a good investment because of the lack of other options. Until oil and the Chinese economy recover, and until the Fed raises interest rates, gold will remain an attractive option. Another reason for the continued growth of gold's value is a lack of production. Gold production like any mineral has become increasingly more expensive. Due to this and the highly volatile nature of gold though, it has been increasingly harder for companies to mine gold. Areas that were once explored during the recession as optimal gold mines are now infeasible for profits with current prices. In the long run, as the price of gold climbs and begins to stabilize around new higher baselines the industry should catch up. However, in the short-term of the next couple years gold's value has the potential to outpace the rate of expansion in the 2017 upcoming year. Another key cause for gold speculation and price inflation will be the election. As both sides lay out their respective economic plans it is

possible that both private individuals and large banks buy gold reserves in order to shift capital into physical wealth. This is a common strategy used when a person or entity is unsure of the market direction. This way they can reshuffle their positions after the fact to match the direction of the market.

The second position I bought was Sturm Ruger and Company (ticker: RGR). Ruger was acquired at 51.4 dollars a share for 115 shares, and as of March 8th, 2016 it sits at a robust 74.7 dollars a share, a hardy 45% gain. Sturm Ruger was one of the companies that rose aggressively in 2012 thanks to the run on firearms. Ruger's success can be attributed to two reasons; the election and sales. As aforementioned, there is a precedent for firearm companies to do exceptionally well in election years. Ruger saw a 24 dollar a share increase in 2012 during the election; going from 34 dollars to 58 by years end. Ruger would peak again in the opening of 2014 in January. After an all-time high of 80 dollars a share the stock would then dip and eventually bottom out at 34 dollars; after three straight years of strong sales Ruger didn't perform as well as expected.

This year though Ruger has made massive gains and their stock is quickly approaching its all-time high and shows no sign of slowing. Ruger is expected to continue to climb as well as sales are buoyed by the election. As the Democratic Party continues to call for bans on new weapons sales and increased background checks sales can be expected to rise again.

The second reason for Ruger's revival is their 2015 fiscal report. After weak earnings in 2014, a depressed stock value in 2015, and investors expected low sales numbers, Ruger has exploded. Ruger posted 551.1 million last year in sales compared to 544.5 million in 2014. Interestingly, when comparing respective fourth quarters for the two years, last year in 2015 fourth quarter sales were 152.4 million and to 2014's were only 122.6 million. Ruger has clearly been a stock on the rise and for the year at least should be a solid investment as the stock continues to rise from the strong election sales.

The third stock I bought was the only short-term trade I made in C-term. The company is called Olin Corporation (ticker: OLN) and is a maker of high capacity munitions. Initially, I bought at a price of 16.50 dollars per share on 1/27/16 and it was expected to do better than it did but I sold two days later for still a profit at 18.30 dollars a share. It was bought because there was a chance that it could be speculated higher along with gun manufacturers due to the election. However, it has traded sideways since being sold off and did not have a high enough yield value. Olin has been down

since April of last year when it was at 32 dollars a share. Its recovery has been slow and was not worth the time to hold it and wait for it to rise.

BAE Systems is another company I chose to invest in and is a British based defense contractor with major US ties. The organization is currently developing the 5-35 fighter jet, a 400 billion dollar contract for the US government. BAE is also competing for another huge military contract for the B-21; the Pentagon's new stealth bomber they are looking to develop. If acquired BAE would be financially secure for the better portion of a decade based on the expected size of the contract and would continue its general upwards trend.

When reviewing the stock history for BAE it is easy to see how volatile the company is. Due to the industry that BAE is in it is directly tied to which political party is running the government. The last presidency of military budget cuts has tamped down BAE's stock over the last several years. The stock would pose a good investment for speculation as the election year continues though. It does stand to reason that if a Republican wins and military spending is raised that it will buoy BAE's stock. I bought BAE for 120 shares on 2/12/2016 for 467.1 dollars a share. I sold my position on 3/7/2016 for 500 dollars a share. After the stock spent the previous week as high as 514 dollars a share it was decided to sell before more of the profits could be lost. This dive in their value was due to the volatility of BAE's stock. It tends to trend up and down but rarely sideways, so once it became apparent the peak was over it was time to sell off the asset. Despite being originally bought to hold for the year the more prudent move was to simply pocket the difference and not hold out for a larger gain and risk losing profits.

The next investment was a long-term investment with Luxottica LLC (ticker: LUX) that failed to materialize into stronger gains. LUX is the parent company to high end American eyeglass designer Ray-Ban. LUX was acquired under the assumption that the stock would do well later on in the year due to high summer sales of sunglasses. The stock was ultimately acquired prematurely and not enough background research was done. In hindsight, LUX is a parent LLC to multiple organizations and thus is not influenced by just the one company Ray-Ban. This means that even though the high end eye wear market may enjoy strong sales due to a shortened winter the overall company may not. The stock was eventually sold off at a loss to free capital to invest elsewhere in an effort to diversify the portfolio. LUX was bought on 2/17/2016 at 57.4 dollars a share and sold 3/7/2016 for 53.15 dollars a share. Across the 100 shares the loss was 425 dollars. My only negative trade during C-term.

The last company I invested in is traded on the NASDAQ and was another maneuver to diversify the portfolio in an effort to minimize losses. The company iRobot (ticker: IRBT) is a designer and manufacturer of high end robotics for consumer usage. The iRobot company recently sold off their 88 million dollar defense industry in order to focus exclusively on their highly profitable home side. Known for their flagship product the Roomba, iRobot is a strong, relatively small company. The company also does the majority of its business overseas, where a recovering Japan and a booming newly wealthy class in China have led their sales. The iRobot company has also been expanding their domestic market and is projecting between 6 and 14 percent growth this quarter. Despite showing a 29% year over year growth the company's stock has remained depressed since the selloff of its military side. This however is expected to only be temporary as iRobot is expected to post higher than expected returns to shareholders this year. Another major reason is that of the 100 million dollars of shares that are hitting the market this year iRobot plans to buy 85 million of them back. Whenever a company consolidates voting power internally and buys back its' own shares the price practically always goes up. It can be expected that even though iRobot is trading sideways now it will spike sometime this year due to strong sales. The amount of sales in iRobot's market in China alone grew by 70 percent last year due to the release of its latest new Roomba. By all measures, the value of iRobot is expected to rise dramatically this year.

10.2 RESULTS

In C-term a total of 103,580.50 dollars were invested in the portfolio. At the end of C-term the overall profit of the portfolio was 11,332.85, 10.89% gain. A near 11% gain in the first quarter of the year is four times the average expectation of 10% annual gains. To put that in perspective it would be more than acceptable to simply move all positions to cash, exit the market and be done for the year, and still be above industry standard gains. However as the old adage goes "never quit on a hot streak" the portfolio was not sold off and instead was expanded for the D-term months March to May.

11 CONCLUSIONS

In closing, we developed four distinct strategies that have the potential to be profitable when applied to trading with real money. The knowledge required to create, develop, and implement these strategies holds real world applications in investing savings. Over the course of this project, we encountered a few problems. Across the board, all group members had to overcome limited computer programming skills to write strategies and indicators in TradeStation. Moreover, we all had to overcome the temptation to make trades based off of intuition with the hopes substantial profits with minimal effort. We solved this problem through taking a scientific approach to trading.

In the future, as we transition from simulated accounts to live accounts, our strategies will require modifications. All of our strategies could benefit by improving the exit order indicators. Further testing and future research could be used to implement the currency trading strategies in other markets such as the equity market. In addition, further testing and future research into identifying market trends could also be used to decrease risk and increase profitability. Our goal now is to continue to improve these strategies and expand our investing knowledge to trade and invest more effectively in our financial futures.

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13 APPENDIX A: TRADE HISTORY AND STRATEGY CODE

13.1 ABRIN BERKEMEYER'S TRADES AND CODE

#	Type	Date/Time	Symbol	Price	Shares/Ctrts/Units - Profit/Loss	Net Profit - Cum Net Profit	% Profit
1	Buy	1/28/2016 11:48	EURUSD	$1.10	100000	$117.00	0.11%
	Sell	1/28/2016 13:37	EURUSD	$1.10	$117.00	$117.00	
2	Buy	1/29/2016 11:58	EURUSD	$1.08	100000	$86.40	0.08%
	Sell	1/31/2016 20:28	EURUSD	$1.08	$86.40	$203.40	
3	Sell	2/1/2016 11:07	EURUSD	$1.09	100000	($65.00)	-0.06%
	Buy	2/1/2016 16:01	EURUSD	$1.09	($65.00)	$138.40	
4	Buy	2/2/2016 12:03	EURUSD	$1.09	100000	($135.00)	-0.12%
	Sell	2/2/2016 12:44	EURUSD	$1.09	($135.00)	$3.40	
5	Sell	2/2/2016 12:44	EURUSD	$1.09	100000	($197.00)	-0.18%
	Buy	2/2/2016 13:49	EURUSD	$1.09	($197.00)	($193.60)	
6	Buy	2/3/2016 14:01	EURUSD	$1.11	100000	($396.00)	-0.36%
	Sell	2/3/2016 14:42	EURUSD	$1.11	($396.00)	($589.60)	
7	Sell	2/3/2016 14:42	EURUSD	$1.11	200000	$144.00	0.06%
	Buy	2/3/2016 14:58	EURUSD	$1.11	$144.00	($445.60)	
8	Sell	2/3/2016 15:08	EURUSD	$1.11	500000	($1,130.00)	-0.20%
	Buy	2/3/2016 15:27	EURUSD	$1.11	($1,130.00)	($1,575.60)	
9	Buy	2/3/2016 15:27	EURUSD	$1.11	500000	$125.00	0.02%
	Sell	2/3/2016 15:42	EURUSD	$1.11	$125.00	($1,450.60)	
10	Sell	2/3/2016 15:43	EURUSD	$1.11	500000	($340.00)	-0.06%
	Buy	2/3/2016 15:46	EURUSD	$1.11	($340.00)	($1,790.60)	
11	Sell	2/3/2016 15:49	EURUSD	$1.11	500000	$85.00	0.02%
	Buy	2/3/2016 15:50	EURUSD	$1.11	$85.00	($1,705.60)	
12	Sell	2/3/2016 15:53	EURUSD	$1.11	500000	($365.00)	-0.07%
	Buy	2/3/2016 15:58	EURUSD	$1.11	($365.00)	($2,070.60)	
13	Sell	2/4/2016 15:07	EURUSD	$1.12	500000	$195.00	0.03%
	Buy	2/4/2016 15:11	EURUSD	$1.12	$195.00	($1,875.60)	
14	Sell	2/4/2016 15:23	EURUSD	$1.12	250000	$2.50	0.00%
	Buy	2/4/2016 15:40	EURUSD	$1.12	$2.50	($1,873.10)	
15	Sell	2/5/2016 2:24	EURUSD	$1.12	500000	$210.00	0.04%
	Buy	2/5/2016 3:08	EURUSD	$1.12	$210.00	($1,663.10)	
16	Buy	2/5/2016 3:09	EURUSD	$1.12	500000	$55.00	0.01%
	Sell	2/5/2016 3:10	EURUSD	$1.12	$55.00	($1,608.10)	
17	Sell	2/5/2016 14:32	EURUSD	$1.11	500000	$55.00	0.01%

	Buy	2/5/2016 14:46	EURUSD	$1.11	$55.00	($1,553.10)	
18	Buy	2/9/2016 13:01	EURUSD	$1.13	500000	$196.50	0.05%
	Sell	2/11/2016 9:52	EURUSD	$1.13	$196.50	($1,356.60)	
19	Sell	2/11/2016 11:00	EURUSD	$1.13	500000	$70.00	0.01%
	Buy	2/11/2016 11:02	EURUSD	$1.13	$70.00	($1,286.60)	
20	Sell	2/11/2016 16:07	EURUSD	$1.13	500000	$10.00	0.00%
	Buy	2/11/2016 16:58	EURUSD	$1.13	$10.00	($1,276.60)	
21	Sell	2/12/2016 11:59	EURUSD	$1.12	500000	$252.00	0.04%
	Buy	2/14/2016 21:01	EURUSD	$1.12	$252.00	($1,024.60)	
22	Sell	2/18/2016 11:15	EURUSD	$1.11	500000	$135.00	0.02%
	Buy	2/18/2016 11:21	EURUSD	$1.11	$135.00	($889.60)	
23	Buy	2/19/2016 12:28	EURUSD	$1.11	500000	$10.00	0.00%
	Sell	2/19/2016 13:23	EURUSD	$1.11	$10.00	($879.60)	
24	Sell	2/22/2016 11:12	EURUSD	$1.10	500000	$100.00	0.02%
	Buy	2/22/2016 11:21	EURUSD	$1.10	$100.00	($779.60)	
25	Sell	2/22/2016 12:26	EURUSD	$1.10	500000	$105.00	0.02%
	Buy	2/22/2016 12:31	EURUSD	$1.10	$105.00	($674.60)	
26	Sell	2/23/2016 12:02	EURUSD	$1.10	500000	$195.00	0.04%
	Buy	2/23/2016 14:21	EURUSD	$1.10	$195.00	($479.60)	
27	Sell	2/26/2016 12:34	EURUSD	$1.09	500000	$100.00	0.02%
	Buy	2/26/2016 12:46	EURUSD	$1.09	$100.00	($379.60)	
28	Sell	2/29/2016 11:05	EURUSD	$1.09	500000	$130.00	0.02%
	Buy	2/29/2016 11:06	EURUSD	$1.09	$130.00	($249.60)	
29	Buy	3/3/2016 11:28	EURUSD	$1.09	500000	$100.00	0.02%
	Sell	3/3/2016 11:35	EURUSD	$1.09	$100.00	($149.60)	
30	Buy	3/7/2016 12:23	EURUSD	$1.10	500000	$45.00	0.01%
	Sell	3/7/2016 12:57	EURUSD	$1.10	$45.00	($104.60)	
31	Sell	3/9/2016 14:17	EURUSD	$1.10	500000	$120.00	0.02%
	Buy	3/9/2016 14:49	EURUSD	$1.10	$120.00	$15.40	
32	Sell	3/18/2016 12:30	EURUSD	$1.13	500000	$90.00	0.02%
	Buy	3/18/2016 12:44	EURUSD	$1.13	$90.00	$105.40	
33	Sell	3/21/2016 12:25	EURUSD	$1.12	500000	$110.00	0.02%
	Buy	3/21/2016 12:46	EURUSD	$1.12	$110.00	$215.40	

Support and Resistance Strategy Code:

Vars: pHigh(0), pLow(99999), myPivot(0), Support(0), pC(0), Resist(0);

If D>D[1] then begin

```
        pHigh = High;
        pLow = Low;
        End;
```

```
If High > pHigh then pHigh = High;
If Low < pLow then pLow = Low;
```

```
If Time = Sess1endtime then begin
      pC = Close;
      myPivot = (pHigh + pLow + pC)/3;
      Support = (myPivot*2) - pHigh;
      Resist = (myPivot*2) - pLow;
      End;
```

13.2 JACOB BILLINGTON'S STRATEGY CODE

Basic Stochastic Oscillator Strategy Code:

```
inputs: Length( 14 ), OverBought( 80 ) ;
variables: oFastK( 0 ), oFastD( 0 ), oSlowK( 0 ), oSlowD( 0 ) ;
Value1 = Stochastic( H, L, C, Length, 3, 3, 1, oFastK, oFastD, oSlowK, oSlowD ) ;

if CurrentBar > 2 and oSlowK crosses under oSlowD and oSlowK > OverBought then
      Sell Short ( "StochSE" ) next bar at market ;
```

```
inputs: Length( 14 ), OverSold( 20 ) ;
variables: oFastK( 0 ), oFastD( 0 ), oSlowK( 0 ), oSlowD( 0 ) ;

Value1 = Stochastic( H, L, C, Length, 3, 3, 1, oFastK, oFastD, oSlowK, oSlowD ) ;

if CurrentBar > 2 and oSlowK crosses over oSlowD and oSlowK < OverSold then
      Buy ( "StochLE" ) next bar at market ;
```

Stochastic RSI Strategy Code:

```
Inputs: Length(14), Schohigh(88),RSISE(70),seprice(close), Scholow(10), RSILE(30), leprice(close);

IF CurrentBar > 1 and
Slowd(Length) > Schohigh and
rsi(seprice, 14) < RSISE and
SlowK(Length) crosses below
SlowD(Length) then Sellshort next bar on market;

IF CurrentBar > 1 and
SlowD(Length) < Scholow and
rsi(leprice, 14) > RSILE and
SlowK(Length) crosses above SlowD(Length) then
```

Buy next bar on market;

Stochastic ADX Strategy Code:

```
inputs: Length( 14 ), OverSold( 10 ), OverBought( 90 ), ADXV(25);
variables: ReturnValue( 0 ), oFastK( 0 ), oFastD( 0 ), oSlowK( 0 ), oSlowD( 0 ) ;

ReturnValue = Stochastic( H, L, C, Length, 3, 3, 1, oFastK, oFastD, oSlowK, oSlowD ) ;

if adx(14) < ADXV and CurrentBar > 2 and oSlowK crosses over oSlowD and oSlowK < OverSold
then
Buy ( !( "StochLE" ) ) next bar at market ;

if adx(14) < ADXV and CurrentBar > 2 and oSlowK crosses under oSlowD and oSlowK >
OverBought then
Sell Short ( !( "StochSE" ) ) next bar at market ;

if adx(14) >= ADXV and CurrentBar > 2 and oSlowK crosses over oSlowD and oSlowK <
OverSold then
Buy to cover ( !( "StochLx" ) ) next bar at market ;

if adx(14) >= ADXV and CurrentBar > 2 and oSlowK crosses under oSlowD and oSlowK >
OverBought then
Sell ( !( "StochSx" ) ) next bar at market ;
```

ADX Counter Strategy:

```
inputs: Length( 14 ), OverSold( 10 ), OverBought( 90 ), Oversold2( 20), Overbought2(80),
ADXV(20), ADXlength(10);
variables: ReturnValue( 0 ), oFastK( 0 ), oFastD( 0 ), oSlowK( 0 ), oSlowD( 0 ), adxcount( 0 ) ;

ReturnValue = Stochastic( H, L, C, Length, 3, 3, 1, oFastK, oFastD, oSlowK, oSlowD ) ;

If adx(14) < ADXV then begin
        adxcount = adxcount +1 ;
        End Else begin
        adxcount = 0;
        end;

if adxcount > ADXlength and CurrentBar > 2 and oSlowK crosses over oSlowD and oSlowK <
OverSold then
                Buy next bar at market ;

if adxcount > ADXlength and CurrentBar > 2 and oSlowK crosses under oSlowD and oSlowK >
OverBought then
```

Sell Short next bar at market ;

if adxcount <= ADXlength and CurrentBar > 2 and oSlowK crosses over oSlowD and oSlowK < OverSold then

Buy to cover next bar at market ;

if adxcount <= ADXlength and CurrentBar > 2 and oSlowK crosses under oSlowD and oSlowK > OverBought then

Sell next bar at market ;

13.3 KIERAN COCHRANE'S TRADES AND CODE

Single Moving Average Strategy Trades:

#	Type	Date/Time	Symbol	Price	Shares/Ctrts/Units Profit	Net Profit and Cum Net Profit	%Profit
1	Buy	11/30/2015 2:21:11 PM	EURUSD	$1.06	100,000	($29.00)	-0.03%
	Sell	11/30/2015 3:54:44 PM	EURUSD	$1.06	($29.00)	($29.00)	
2	Buy	11/30/2015 2:21:11 PM	EURUSD	$1.06	100,000	$400.50	0.38%
	Sell	12/1/2015 9:57:45 AM	EURUSD	$1.06	$400.50	$371.50	
3	Buy	12/1/2015 9:57:31 AM	EURUSD	$1.06	100,000	($41.00)	-0.04%
	Sell	12/1/2015 9:57:46 AM	EURUSD	$1.06	($41.00)	$330.50	
4	Buy	12/1/2015 10:00:03 AM	EURUSD	$1.06	100,000	$17.01	0.02%
	Sell	12/1/2015 10:08:37 AM	EURUSD	$1.06	$17.01	$347.51	
5	Buy	12/1/2015 10:00:03 AM	EURUSD	$1.06	100,000	$33.00	0.03%
	Sell	12/1/2015 10:11:02 AM	EURUSD	$1.06	$33.00	$380.51	
6	Sell	12/1/2015 10:11:02 AM	EURUSD	$1.06	100,000	($23.00)	-0.02%
	Buy	12/1/2015 10:20:16 AM	EURUSD	$1.06	($23.00)	$357.51	
7	Buy	12/1/2015 10:20:16 AM	EURUSD	$1.06	100,000	($65.00)	-0.06%
	Sell	12/1/2015 10:27:02 AM	EURUSD	$1.06	($65.00)	$292.51	
8	Sell	12/1/2015 10:27:02 AM	EURUSD	$1.06	100,000	($7.00)	-0.01%
	Buy	12/1/2015 10:32:00 AM	EURUSD	$1.06	($7.00)	$285.51	
9	Buy	12/1/2015 10:32:01 AM	EURUSD	$1.06	100,000	($71.00)	-0.07%
	Sell	12/1/2015 10:44:15 AM	EURUSD	$1.06	($71.00)	$214.51	
10	Sell	12/1/2015 10:44:15 AM	EURUSD	$1.06	100,000	$70.00	0.07%
	Buy	12/1/2015 10:55:00 AM	EURUSD	$1.06	$70.00	$284.51	
11	Buy	12/1/2015 10:55:00 AM	EURUSD	$1.06	100,000	($73.00)	-0.07%
	Sell	12/1/2015 10:58:47 AM	EURUSD	$1.06	($73.00)	$211.52	
12	Sell	12/1/2015 10:58:47 AM	EURUSD	$1.06	100,000	($27.00)	-0.03%
	Buy	12/1/2015 11:07:19 AM	EURUSD	$1.06	($27.00)	$184.52	
13	Buy	12/1/2015 11:07:19 AM	EURUSD	$1.06	100,000	$21.00	0.02%
	Sell	12/1/2015 11:13:05 AM	EURUSD	$1.06	$21.00	$205.51	

14	Sell	12/1/2015 11:13:05 AM	EURUSD	$1.06	100,000	($35.00)	-0.03%
	Buy	12/1/2015 11:18:14 AM	EURUSD	$1.06	($35.00)	$170.51	
15	Buy	12/1/2015 11:41:32 AM	EURUSD	$1.06	100,000	($6.00)	-0.01%
	Sell	12/1/2015 11:47:08 AM	EURUSD	$1.06	($6.00)	$164.51	
16	Buy	12/1/2015 11:41:32 AM	EURUSD	$1.06	100,000	($6.00)	-0.01%
	Sell	12/1/2015 11:47:08 AM	EURUSD	$1.06	($6.00)	$158.51	
17	Buy	12/1/2015 11:51:56 AM	EURUSD	$1.06	100,000	($20.00)	-0.02%
	Sell	12/1/2015 11:54:51 AM	EURUSD	$1.06	($20.00)	$138.51	
18	Buy	12/1/2015 11:51:56 AM	EURUSD	$1.06	100,000	($20.00)	-0.02%
	Sell	12/1/2015 11:54:51 AM	EURUSD	$1.06	($20.00)	$118.51	
19	Buy	12/1/2015 11:55:34 AM	EURUSD	$1.06	100,000	($39.00)	-0.04%
	Sell	12/1/2015 12:02:36 PM	EURUSD	$1.06	($39.00)	$79.52	
20	Buy	12/1/2015 11:55:34 AM	EURUSD	$1.06	100,000	($39.00)	-0.04%
	Sell	12/1/2015 12:02:36 PM	EURUSD	$1.06	($39.00)	$40.52	
21	Buy	12/1/2015 12:14:38 PM	EURUSD	$1.06	100,000	$14.00	0.01%
	Sell	12/1/2015 12:20:00 PM	EURUSD	$1.06	$14.00	$54.51	
22	Buy	12/1/2015 12:14:38 PM	EURUSD	$1.06	100,000	$14.00	0.01%
	Sell	12/1/2015 12:20:00 PM	EURUSD	$1.06	$14.00	$68.51	
23	Buy	12/1/2015 12:20:15 PM	EURUSD	$1.06	100,000	($6.00)	-0.01%
	Sell	12/1/2015 12:23:14 PM	EURUSD	$1.06	($6.00)	$62.51	
24	Buy	12/1/2015 12:20:15 PM	EURUSD	$1.06	100,000	($8.00)	-0.01%
	Sell	12/1/2015 12:23:15 PM	EURUSD	$1.06	($8.00)	$54.51	
25	Sell	12/1/2015 12:24:00 PM	EURUSD	$1.06	100,000	($39.00)	-0.04%
	Buy	12/1/2015 12:32:39 PM	EURUSD	$1.06	($39.00)	$15.51	
26	Sell	12/1/2015 12:24:00 PM	EURUSD	$1.06	100,000	($39.00)	-0.04%
	Buy	12/1/2015 12:32:40 PM	EURUSD	$1.06	($39.00)	($23.49)	
27	Sell	12/1/2015 12:41:17 PM	EURUSD	$1.06	100,000	($18.00)	-0.02%
	Buy	12/1/2015 12:49:46 PM	EURUSD	$1.06	($18.00)	($41.49)	
28	Sell	12/1/2015 12:41:17 PM	EURUSD	$1.06	100,000	($18.00)	-0.02%
	Buy	12/1/2015 12:49:46 PM	EURUSD	$1.06	($18.00)	($59.49)	
29	Buy	12/1/2015 12:57:04 PM	EURUSD	$1.06	100,000	$93.00	0.09%
	Sell	12/1/2015 1:19:31 PM	EURUSD	$1.06	$93.00	$33.51	
30	Buy	12/1/2015 12:57:04 PM	EURUSD	$1.06	100,000	$93.00	0.09%
	Sell	12/1/2015 1:19:31 PM	EURUSD	$1.06	$93.00	$126.51	
31	Buy	12/1/2015 1:22:09 PM	EURUSD	$1.06	100,000	$1.00	0.00%
	Sell	12/1/2015 1:25:00 PM	EURUSD	$1.06	$1.00	$127.51	
32	Buy	12/1/2015 1:22:09 PM	EURUSD	$1.06	100,000	($4.00)	-0.00%
	Sell	12/1/2015 1:25:00 PM	EURUSD	$1.06	($4.00)	$123.51	
33	Buy	12/1/2015 1:36:04 PM	EURUSD	$1.06	100,000	$63.00	0.06%
	Sell	12/1/2015 1:46:02 PM	EURUSD	$1.06	$63.00	$186.51	
34	Buy	12/1/2015 1:36:04 PM	EURUSD	$1.06	100,000	$64.00	0.06%

	Sell	12/1/2015 1:46:03 PM	EURUSD	$1.06	$64.00	$250.51	
35	Buy	12/1/2015 1:55:33 PM	EURUSD	$1.06	100,000	$9.00	0.01%
	Sell	12/1/2015 1:59:00 PM	EURUSD	$1.06	$9.00	$259.51	
36	Buy	12/1/2015 1:55:33 PM	EURUSD	$1.06	100,000	$9.00	0.01%
	Sell	12/1/2015 1:59:00 PM	EURUSD	$1.06	$9.00	$268.51	
37	Buy	12/1/2015 1:59:30 PM	EURUSD	$1.06	100,000	($44.00)	-0.04%
	Sell	12/1/2015 2:00:15 PM	EURUSD	$1.06	($44.00)	$224.51	
38	Buy	12/1/2015 1:59:30 PM	EURUSD	$1.06	100,000	($44.00)	-0.04%
	Sell	12/1/2015 2:00:15 PM	EURUSD	$1.06	($44.00)	$180.51	
39	Buy	12/1/2015 2:02:33 PM	EURUSD	$1.06	100,000	($13.00)	-0.01%
	Sell	12/1/2015 2:06:01 PM	EURUSD	$1.06	($13.00)	$167.51	
40	Buy	12/1/2015 2:02:33 PM	EURUSD	$1.06	100,000	($14.00)	-0.01%
	Sell	12/1/2015 2:06:01 PM	EURUSD	$1.06	($14.00)	$153.51	
41	Buy	12/1/2015 2:13:31 PM	EURUSD	$1.06	100,000	($14.00)	-0.01%
	Sell	12/1/2015 2:30:14 PM	EURUSD	$1.06	($14.00)	$139.51	
42	Buy	12/1/2015 2:13:31 PM	EURUSD	$1.06	100,000	($14.00)	-0.01%
	Sell	12/1/2015 2:30:15 PM	EURUSD	$1.06	($14.00)	$125.51	
43	Sell	12/1/2015 2:35:01 PM	EURUSD	$1.06	100,000	($15.00)	-0.01%
	Buy	12/1/2015 2:37:23 PM	EURUSD	$1.06	($15.00)	$110.51	
44	Sell	12/1/2015 2:35:01 PM	EURUSD	$1.06	100,000	($15.00)	-0.01%
	Buy	12/1/2015 2:37:23 PM	EURUSD	$1.06	($15.00)	$95.51	
45	Sell	12/1/2015 2:42:33 PM	EURUSD	$1.06	100,000	($14.00)	-0.01%
	Buy	12/1/2015 2:48:47 PM	EURUSD	$1.06	($14.00)	$81.51	
46	Sell	12/1/2015 2:42:34 PM	EURUSD	$1.06	100,000	($14.00)	-0.01%
	Buy	12/1/2015 2:48:47 PM	EURUSD	$1.06	($14.00)	$67.51	
47	Buy	12/1/2015 2:54:16 PM	EURUSD	$1.06	100,000	($23.00)	-0.02%
	Sell	12/1/2015 2:56:04 PM	EURUSD	$1.06	($23.00)	$44.51	
48	Buy	12/1/2015 2:54:16 PM	EURUSD	$1.06	100,000	($23.00)	-0.02%
	Sell	12/1/2015 2:56:04 PM	EURUSD	$1.06	($23.00)	$21.51	
49	Buy	12/1/2015 3:12:40 PM	EURUSD	$1.06	100,000	($10.00)	-0.01%
	Sell	12/1/2015 3:30:42 PM	EURUSD	$1.06	($10.00)	$11.51	
50	Buy	12/1/2015 3:12:41 PM	EURUSD	$1.06	100,000	($10.00)	-0.01%
	Sell	12/1/2015 3:30:42 PM	EURUSD	$1.06	($10.00)	$1.51	
51	Buy	12/1/2015 3:37:52 PM	EURUSD	$1.06	100,000	($15.00)	-0.01%
	Sell	12/1/2015 3:46:21 PM	EURUSD	$1.06	($15.00)	($13.49)	
52	Buy	12/1/2015 3:37:52 PM	EURUSD	$1.06	100,000	($15.00)	-0.01%
	Sell	12/1/2015 3:46:21 PM	EURUSD	$1.06	($15.00)	($28.49)	
53	Sell	12/1/2015 3:46:22 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Buy	12/1/2015 3:47:47 PM	EURUSD	$1.06	($28.00)	($56.48)	
54	Sell	12/1/2015 3:46:22 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Buy	12/1/2015 3:47:47 PM	EURUSD	$1.06	($28.00)	($84.48)	

55	Sell	12/1/2015 3:57:38 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Buy	12/1/2015 4:01:06 PM	EURUSD	$1.06	($28.00)	($112.48)	
56	Sell	12/1/2015 3:57:38 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Buy	12/1/2015 4:01:06 PM	EURUSD	$1.06	($28.00)	($140.48)	
57	Sell	12/1/2015 4:05:12 PM	EURUSD	$1.06	100,000	($23.00)	-0.02%
	Buy	12/1/2015 4:07:45 PM	EURUSD	$1.06	($23.00)	($163.49)	
58	Sell	12/1/2015 4:05:12 PM	EURUSD	$1.06	100,000	($23.00)	-0.02%
	Buy	12/1/2015 4:07:45 PM	EURUSD	$1.06	($23.00)	($186.49)	
59	Buy	12/1/2015 4:09:27 PM	EURUSD	$1.06	100,000	($13.00)	-0.01%
	Sell	12/1/2015 4:11:00 PM	EURUSD	$1.06	($13.00)	($199.49)	
60	Buy	12/1/2015 4:09:27 PM	EURUSD	$1.06	100,000	($13.00)	-0.01%
	Sell	12/1/2015 4:11:00 PM	EURUSD	$1.06	($13.00)	($212.49)	
61	Buy	12/1/2015 4:15:35 PM	EURUSD	$1.06	100,000	($82.00)	-0.08%
	Sell	12/1/2015 4:23:29 PM	EURUSD	$1.06	($82.00)	($294.49)	
62	Buy	12/1/2015 4:15:35 PM	EURUSD	$1.06	100,000	($82.00)	-0.08%
	Sell	12/1/2015 4:23:29 PM	EURUSD	$1.06	($82.00)	($376.49)	
63	Buy	12/1/2015 4:27:04 PM	EURUSD	$1.06	100,000	$65.00	0.06%
	Sell	12/1/2015 4:52:00 PM	EURUSD	$1.06	$65.00	($311.49)	
64	Buy	12/1/2015 4:27:04 PM	EURUSD	$1.06	100,000	$65.00	0.06%
	Sell	12/1/2015 4:52:00 PM	EURUSD	$1.06	$65.00	($246.49)	
65	Buy	12/1/2015 4:52:23 PM	EURUSD	$1.06	100,000	($16.00)	-0.02%
	Sell	12/1/2015 4:56:07 PM	EURUSD	$1.06	($16.00)	($262.49)	
66	Buy	12/1/2015 4:52:23 PM	EURUSD	$1.06	100,000	($16.00)	-0.02%
	Sell	12/1/2015 4:56:07 PM	EURUSD	$1.06	($16.00)	($278.49)	
67	Sell	12/1/2015 4:57:11 PM	EURUSD	$1.06	100,000	$0.10	-0.00%
	Buy	12/1/2015 5:12:25 PM	EURUSD	$1.06	$0.10	($278.39)	
68	Sell	12/1/2015 4:57:11 PM	EURUSD	$1.06	100,000	$0.10	-0.00%
	Buy	12/1/2015 5:12:25 PM	EURUSD	$1.06	$0.10	($278.29)	
69	Sell	12/1/2015 5:16:19 PM	EURUSD	$1.06	100,000	($15.00)	-0.01%
	Buy	12/1/2015 5:20:00 PM	EURUSD	$1.06	($15.00)	($293.29)	
70	Sell	12/1/2015 5:16:19 PM	EURUSD	$1.06	100,000	($15.00)	-0.01%
	Buy	12/1/2015 5:20:00 PM	EURUSD	$1.06	($15.00)	($308.29)	
71	Sell	12/1/2015 5:43:38 PM	EURUSD	$1.06	100,000	($32.00)	-0.03%
	Buy	12/1/2015 5:46:06 PM	EURUSD	$1.06	($32.00)	($340.29)	
72	Sell	12/1/2015 5:43:38 PM	EURUSD	$1.06	100,000	($24.00)	-0.02%
	Buy	12/1/2015 6:01:49 PM	EURUSD	$1.06	($24.00)	($364.29)	
73	Sell	12/1/2015 6:16:37 PM	EURUSD	$1.06	100,000	($13.00)	-0.01%
	Buy	12/1/2015 6:22:31 PM	EURUSD	$1.06	($13.00)	($377.29)	
74	Sell	12/1/2015 6:16:37 PM	EURUSD	$1.06	100,000	($13.00)	-0.01%
	Buy	12/1/2015 6:22:31 PM	EURUSD	$1.06	($13.00)	($390.29)	
75	Sell	12/1/2015 6:29:04 PM	EURUSD	$1.06	100,000	($38.00)	-0.04%

	Buy	12/1/2015 6:29:58 PM	EURUSD	$1.06	($38.00)	($428.29)	
76	Sell	12/1/2015 6:29:04 PM	EURUSD	$1.06	100,000	($38.00)	-0.04%
	Buy	12/1/2015 6:29:58 PM	EURUSD	$1.06	($38.00)	($466.29)	
77	Sell	12/1/2015 6:32:18 PM	EURUSD	$1.06	100,000	($37.00)	-0.03%
	Buy	12/1/2015 6:39:15 PM	EURUSD	$1.06	($37.00)	($503.29)	
78	Sell	12/1/2015 6:32:18 PM	EURUSD	$1.06	100,000	($38.00)	-0.04%
	Buy	12/1/2015 6:39:15 PM	EURUSD	$1.06	($38.00)	($541.29)	
79	Buy	12/1/2015 6:39:15 PM	EURUSD	$1.06	100,000	($25.00)	-0.02%
	Sell	12/1/2015 6:45:40 PM	EURUSD	$1.06	($25.00)	($566.29)	
80	Buy	12/1/2015 6:39:15 PM	EURUSD	$1.06	100,000	($25.00)	-0.02%
	Sell	12/1/2015 6:45:40 PM	EURUSD	$1.06	($25.00)	($591.29)	
81	Buy	12/1/2015 4:30:04 PM	EURCAD	$1.42	100,000	($97.46)	-0.09%
	Sell	12/1/2015 6:51:22 PM	EURCAD	$1.42	($97.46)	($688.75)	
82	Buy	12/1/2015 4:30:04 PM	EURCAD	$1.42	100,000	($97.46)	-0.09%
	Sell	12/1/2015 6:51:22 PM	EURCAD	$1.42	($97.46)	($786.21)	
83	Sell	12/1/2015 6:46:55 PM	EURUSD	$1.06	100,000	($6.00)	-0.01%
	Buy	12/1/2015 6:58:02 PM	EURUSD	$1.06	($6.00)	($792.21)	
84	Sell	12/1/2015 6:46:55 PM	EURUSD	$1.06	100,000	($7.00)	-0.01%
	Buy	12/1/2015 6:58:02 PM	EURUSD	$1.06	($7.00)	($799.21)	
85	Buy	12/1/2015 7:02:37 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Sell	12/1/2015 7:16:02 PM	EURUSD	$1.06	($28.00)	($827.21)	
86	Buy	12/1/2015 7:02:37 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Sell	12/1/2015 7:16:02 PM	EURUSD	$1.06	($28.00)	($855.21)	
87	Buy	12/1/2015 7:22:46 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Sell	12/1/2015 7:24:25 PM	EURUSD	$1.06	($28.00)	($883.21)	
88	Buy	12/1/2015 7:22:47 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Sell	12/1/2015 7:24:25 PM	EURUSD	$1.06	($28.00)	($911.21)	
89	Sell	12/1/2015 7:25:02 PM	EURUSD	$1.06	100,000	($12.00)	-0.01%
	Buy	12/1/2015 7:27:11 PM	EURUSD	$1.06	($12.00)	($923.21)	
90	Sell	12/1/2015 7:25:02 PM	EURUSD	$1.06	100,000	($12.00)	-0.01%
	Buy	12/1/2015 7:27:11 PM	EURUSD	$1.06	($12.00)	($935.21)	
91	Sell	12/1/2015 7:27:33 PM	EURUSD	$1.06	100,000	($35.00)	-0.03%
	Buy	12/1/2015 7:30:03 PM	EURUSD	$1.06	($35.00)	($970.21)	
92	Sell	12/1/2015 7:27:33 PM	EURUSD	$1.06	100,000	($35.00)	-0.03%
	Buy	12/1/2015 7:30:03 PM	EURUSD	$1.06	($35.00)	($1,005.21)	
93	Sell	12/1/2015 7:31:48 PM	EURUSD	$1.06	100,000	($14.00)	-0.01%
	Buy	12/1/2015 7:34:24 PM	EURUSD	$1.06	($14.00)	($1,019.21)	
94	Sell	12/1/2015 7:31:48 PM	EURUSD	$1.06	100,000	($14.00)	-0.01%
	Buy	12/1/2015 7:34:24 PM	EURUSD	$1.06	($14.00)	($1,033.21)	
95	Sell	12/1/2015 7:37:56 PM	EURUSD	$1.06	100,000	$19.00	0.02%
	Buy	12/1/2015 7:56:06 PM	EURUSD	$1.06	$19.00	($1,014.21)	

96	Sell	12/1/2015 7:37:56 PM	EURUSD	$1.06	100,000	$19.00	0.02%
	Buy	12/1/2015 7:56:06 PM	EURUSD	$1.06	$19.00	($995.21)	
97	Sell	12/1/2015 7:48:02 PM	EURUSD	$1.06	100,000	($30.00)	-0.03%
	Buy	12/1/2015 7:58:03 PM	EURUSD	$1.06	($30.00)	($1,025.21)	
98	Sell	12/1/2015 7:57:49 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Buy	12/1/2015 7:58:03 PM	EURUSD	$1.06	($28.00)	($1,053.21)	
99	Sell	12/1/2015 7:57:49 PM	EURUSD	$1.06	100,000	$6.00	0.01%
	Buy	12/1/2015 8:24:54 PM	EURUSD	$1.06	$6.00	($1,047.21)	
100	Sell	12/1/2015 8:06:19 PM	EURUSD	$1.06	100,000	($12.00)	-0.01%
	Buy	12/1/2015 8:24:54 PM	EURUSD	$1.06	($12.00)	($1,059.21)	
101	Sell	12/1/2015 8:06:19 PM	EURUSD	$1.06	100,000	($23.00)	-0.02%
	Buy	12/1/2015 8:27:02 PM	EURUSD	$1.06	($23.00)	($1,082.21)	
102	Buy	12/1/2015 8:27:02 PM	EURUSD	$1.06	100,000	($17.00)	-0.02%
	Sell	12/1/2015 8:35:01 PM	EURUSD	$1.06	($17.00)	($1,099.21)	
103	Buy	12/1/2015 7:22:59 PM	EURCAD	$1.42	100,000	($64.47)	-0.06%
	Sell	12/1/2015 8:35:30 PM	EURCAD	$1.42	($64.47)	($1,163.68)	
104	Buy	12/1/2015 7:22:59 PM	EURCAD	$1.42	100,000	($64.47)	-0.06%
	Sell	12/1/2015 8:35:30 PM	EURCAD	$1.42	($64.47)	($1,228.15)	
105	Sell	12/1/2015 8:35:02 PM	EURUSD	$1.06	100,000	($21.00)	-0.02%
	Buy	12/1/2015 8:36:17 PM	EURUSD	$1.06	($21.00)	($1,249.15)	
106	Buy	12/1/2015 8:36:17 PM	EURUSD	$1.06	100,000	($28.00)	-0.03%
	Sell	12/1/2015 8:37:02 PM	EURUSD	$1.06	($28.00)	($1,277.15)	
107	Sell	12/1/2015 8:37:02 PM	EURUSD	$1.06	100,000	($19.00)	-0.02%
	Buy	12/1/2015 8:52:30 PM	EURUSD	$1.06	($19.00)	($1,296.15)	
108	Buy	12/1/2015 8:52:30 PM	EURUSD	$1.06	100,000	($1.00)	-0.00%
	Sell	12/1/2015 8:56:49 PM	EURUSD	$1.06	($1.00)	($1,297.15)	
109	Sell	12/1/2015 8:56:49 PM	EURUSD	$1.06	100,000	$24.00	0.02%
	Buy	12/1/2015 9:09:16 PM	EURUSD	$1.06	$24.00	($1,273.15)	
110	Buy	12/1/2015 9:09:16 PM	EURUSD	$1.06	100,000	($11.00)	-0.01%
	Sell	12/1/2015 9:10:54 PM	EURUSD	$1.06	($11.00)	($1,284.15)	
111	Sell	12/1/2015 9:10:54 PM	EURUSD	$1.06	100,000	($19.00)	-0.02%
	Buy	12/1/2015 9:12:54 PM	EURUSD	$1.06	($19.00)	($1,303.15)	
112	Buy	12/1/2015 9:12:54 PM	EURUSD	$1.06	100,000	($5.00)	-0.00%
	Sell	12/1/2015 9:22:24 PM	EURUSD	$1.06	($5.00)	($1,308.15)	
113	Sell	12/1/2015 9:22:24 PM	EURUSD	$1.06	100,000	$3.00	0.00%
	Buy	12/1/2015 9:31:33 PM	EURUSD	$1.06	$3.00	($1,305.15)	
114	Buy	12/1/2015 9:31:33 PM	EURUSD	$1.06	100,000	($25.00)	-0.02%
	Sell	12/1/2015 9:32:00 PM	EURUSD	$1.06	($25.00)	($1,330.15)	
115	Sell	12/1/2015 9:32:00 PM	EURUSD	$1.06	100,000	($36.00)	-0.03%
	Buy	12/1/2015 9:34:29 PM	EURUSD	$1.06	($36.00)	($1,366.15)	
116	Buy	12/1/2015 9:34:29 PM	EURUSD	$1.06	100,000	($21.00)	-0.02%

	Sell	12/1/2015 9:35:30 PM	EURUSD	$1.06	($21.00)	($1,387.15)	
117	Sell	12/1/2015 9:35:30 PM	EURUSD	$1.06	100,000	($15.00)	-0.01%
	Buy	12/1/2015 9:41:51 PM	EURUSD	$1.06	($15.00)	($1,402.15)	
118	Buy	12/1/2015 9:41:51 PM	EURUSD	$1.06	100,000	$15.00	0.01%
	Sell	12/1/2015 9:49:21 PM	EURUSD	$1.06	$15.00	($1,387.15)	
119	Sell	12/1/2015 9:49:21 PM	EURUSD	$1.06	100,000	($17.00)	-0.02%
	Buy	12/1/2015 9:56:22 PM	EURUSD	$1.06	($17.00)	($1,404.15)	
120	Sell	12/1/2015 9:52:33 PM	EURUSD	$1.06	100,000	($33.00)	-0.03%
	Buy	12/1/2015 9:56:22 PM	EURUSD	$1.06	($33.00)	($1,437.15)	
121	Sell	12/1/2015 9:52:33 PM	EURUSD	$1.06	100,000	($10.00)	-0.01%
	Buy	12/1/2015 10:07:49 PM	EURUSD	$1.06	($10.00)	($1,447.15)	
122	Sell	12/1/2015 9:57:54 PM	EURUSD	$1.06	100,000	$2.00	0.00%
	Buy	12/1/2015 10:07:49 PM	EURUSD	$1.06	$2.00	($1,445.15)	
123	Sell	12/1/2015 9:57:54 PM	EURUSD	$1.06	100,000	$4.00	0.00%
	Buy	12/1/2015 10:13:03 PM	EURUSD	$1.06	$4.00	($1,441.15)	
124	Sell	12/1/2015 10:10:06 PM	EURUSD	$1.06	100,000	($24.00)	-0.02%
	Buy	12/1/2015 10:13:03 PM	EURUSD	$1.06	($24.00)	($1,465.15)	
125	Sell	12/1/2015 10:10:06 PM	EURUSD	$1.06	100,000	($8.00)	-0.01%
	Buy	12/1/2015 10:18:02 PM	EURUSD	$1.06	($8.00)	($1,473.15)	
126	Buy	12/1/2015 10:18:02 PM	EURUSD	$1.06	100,000	($29.00)	-0.03%
	Sell	12/1/2015 10:26:10 PM	EURUSD	$1.06	($29.00)	($1,502.15)	
127	Sell	12/1/2015 10:26:10 PM	EURUSD	$1.06	100,000	($23.00)	-0.02%
	Buy	12/1/2015 10:29:07 PM	EURUSD	$1.06	($23.00)	($1,525.15)	
128	Buy	12/1/2015 10:29:07 PM	EURUSD	$1.06	100,000	$2,250.50	2.13%
	Sell	12/7/2015 2:35:01 PM	EURUSD	$1.08	$2,250.50	$725.35	
129	Buy	12/7/2015 3:57:47 PM	EURUSD	$1.08	100,000	($63.00)	-0.06%
	Sell	12/7/2015 4:03:19 PM	EURUSD	$1.08	($63.00)	$662.35	
130	Buy	12/7/2015 3:58:27 PM	EURUSD	$1.08	100,000	($66.00)	-0.06%
	Sell	12/7/2015 4:03:19 PM	EURUSD	$1.08	($66.00)	$596.35	
131	Sell	12/7/2015 4:05:02 PM	EURUSD	$1.08	100,000	($42.00)	-0.04%
	Buy	12/7/2015 4:05:15 PM	EURUSD	$1.08	($42.00)	$554.35	
132	Sell	12/7/2015 4:05:02 PM	EURUSD	$1.08	100,000	($42.00)	-0.04%
	Buy	12/7/2015 4:05:15 PM	EURUSD	$1.08	($42.00)	$512.35	
133	Sell	12/7/2015 4:13:36 PM	EURUSD	$1.08	100,000	$43.00	0.04%
	Buy	12/7/2015 4:22:54 PM	EURUSD	$1.08	$43.00	$555.35	
134	Sell	12/7/2015 4:13:36 PM	EURUSD	$1.08	100,000	$36.00	0.03%
	Buy	12/7/2015 4:22:54 PM	EURUSD	$1.08	$36.00	$591.35	
135	Sell	12/7/2015 4:25:19 PM	EURUSD	$1.08	100,000	($36.00)	-0.03%
	Buy	12/7/2015 4:30:49 PM	EURUSD	$1.08	($36.00)	$555.35	
136	Sell	12/7/2015 4:25:19 PM	EURUSD	$1.08	100,000	($36.00)	-0.03%
	Buy	12/7/2015 4:30:50 PM	EURUSD	$1.08	($36.00)	$519.35	

137	Sell	12/7/2015 4:44:46 PM	EURUSD	$1.08	100,000	($1,530.70)	-1.42%
	Buy	12/13/2015 5:04:21 PM	EURUSD	$1.10	($1,530.70)	($1,011.35)	
138	Sell	12/7/2015 4:44:46 PM	EURUSD	$1.08	100,000	($1,530.70)	-1.42%
	Buy	12/13/2015 5:04:21 PM	EURUSD	$1.10	($1,530.70)	($2,542.05)	
139	Buy	12/13/2015 5:04:21 PM	EURUSD	$1.10	100,000	$470.00	0.43%
	Sell	12/14/2015 12:07:31 PM	EURUSD	$1.10	$470.00	($2,072.06)	
140	Buy	12/13/2015 9:18:01 PM	EURUSD	$1.10	100,000	$442.00	0.40%
	Sell	12/14/2015 1:00:36 PM	EURUSD	$1.10	$442.00	($1,630.06)	
141	Buy	12/13/2015 9:18:01 PM	EURUSD	$1.10	10,000	($52.94)	-0.48%
	Sell	12/15/2015 12:21:37 PM	EURUSD	$1.09	($52.94)	($1,683.00)	
142	Buy	12/13/2015 9:18:01 PM	EURUSD	$1.10	90,000	($1,311.75)	-1.31%
	Sell	12/18/2015 6:36:02 AM	EURUSD	$1.08	($1,311.75)	($2,994.75)	
143	Buy	12/14/2015 1:19:28 PM	EURUSD	$1.10	10,000	($194.25)	-1.75%
	Sell	12/18/2015 6:36:02 AM	EURUSD	$1.08	($194.25)	($3,189.00)	
144	Buy	12/18/2015 3:30:00 AM	EURUSD	$1.08	100,000	$93.00	0.09%
	Sell	12/18/2015 6:36:02 AM	EURUSD	$1.08	$93.00	($3,096.00)	
145	Buy	12/18/2015 8:42:04 AM	EURUSD	$1.08	100,000	$2.00	0.00%
	Sell	12/18/2015 9:48:00 AM	EURUSD	$1.08	$2.00	($3,094.00)	
146	Buy	12/18/2015 8:42:04 AM	EURUSD	$1.08	100,000	$2.00	0.00%
	Sell	12/18/2015 9:48:00 AM	EURUSD	$1.08	$2.00	($3,092.00)	
147	Buy	12/7/2015 3:52:48 PM	EURCAD	$1.47	100,000	$2,973.20	2.83%
	Sell	12/18/2015 12:30:57 PM	EURCAD	$1.51	$2,973.20	($118.80)	

Double Moving Averages Strategy Trades:

#	Type	Date/Time	Symbol	Price	Shares/Ctrts/Units Profit	Net Profit and Cum Net Profit	%Profit
1	Buy	1/20/2016 2:42:01 AM	EURUSD	$1.09	100,000	$49.00	0.04%
	Sell	1/20/2016 3:15:01 AM	EURUSD	$1.10	$49.00	$49.00	
2	Sell	1/20/2016 3:15:01 AM	EURUSD	$1.10	100,000	$1,527.30	1.39%
	Buy	1/22/2016 1:27:08 PM	EURUSD	$1.08	$1,527.30	$1,576.30	
3	Sell	1/22/2016 10:48:01 AM	EURUSD	$1.08	100,000	$320.00	0.30%
	Buy	1/22/2016 1:27:08 PM	EURUSD	$1.08	$320.00	$1,896.30	
4	Sell	1/20/2016 3:53:10 PM	USDJPY	¥116.93	100,000	($1,537.57)	-1.56%
	Buy	1/22/2016 3:09:55 PM	USDJPY	¥118.76	($1,537.57)	$358.73	
5	Sell	1/22/2016 9:48:02 AM	USDJPY	¥118.29	100,000	($398.29)	-0.40%
	Buy	1/22/2016 3:09:55 PM	USDJPY	¥118.76	($398.29)	($39.55)	
6	Sell	1/20/2016 8:10:07 AM	EURCAD	$1.60	100,000	$4,964.69	4.39%
	Buy	1/22/2016 4:50:00 PM	EURCAD	$1.53	$4,964.69	$4,925.14	
7	Sell	1/22/2016 2:30:10 PM	USDJPY	¥118.72	100,000	$326.26	0.33%
	Buy	1/25/2016 4:34:13 PM	USDJPY	¥118.33	$326.26	$5,251.40	
8	Sell	1/22/2016 2:30:10 PM	USDJPY	¥118.72	100,000	$548.88	0.55%
	Buy	1/26/2016 12:46:23 AM	USDJPY	¥118.07	$548.88	$5,800.28	

9	Sell	1/26/2016 1:46:03 AM	USDJPY	¥117.81	100,000	($39.70)	-0.04%
	Buy	1/26/2016 3:20:24 AM	USDJPY	¥117.86	($39.70)	$5,760.58	
10	Sell	1/26/2016 7:31:45 AM	USDJPY	¥118.37	100,000	($105.57)	-0.11%
	Buy	1/26/2016 8:54:12 AM	USDJPY	¥118.49	($105.57)	$5,655.01	
11	Sell	1/26/2016 10:57:16 AM	USDJPY	¥118.46	100,000	($45.61)	-0.05%
	Buy	1/26/2016 11:46:05 AM	USDJPY	¥118.52	($45.61)	$5,609.40	
12	Sell	1/26/2016 1:43:08 PM	USDJPY	¥118.54	100,000	$74.31	0.07%
	Buy	1/26/2016 3:52:17 PM	USDJPY	¥118.45	$74.31	$5,683.71	
13	Sell	1/27/2016 1:07:23 AM	USDJPY	¥118.32	100,000	($80.04)	-0.08%
	Buy	1/27/2016 2:01:01 AM	USDJPY	¥118.41	($80.04)	$5,603.68	
14	Sell	1/27/2016 1:07:23 AM	USDJPY	¥118.32	100,000	($80.04)	-0.08%
	Buy	1/27/2016 2:01:01 AM	USDJPY	¥118.41	($80.04)	$5,523.64	
15	Sell	1/27/2016 2:46:07 AM	USDJPY	¥118.23	100,000	($51.39)	-0.05%
	Buy	1/27/2016 6:00:10 AM	USDJPY	¥118.29	($51.39)	$5,472.24	
16	Sell	1/27/2016 2:46:07 AM	USDJPY	¥118.23	100,000	($52.24)	-0.05%
	Buy	1/27/2016 6:00:10 AM	USDJPY	¥118.29	($52.24)	$5,420.01	
17	Sell	1/27/2016 6:51:03 AM	USDJPY	¥118.26	100,000	($162.60)	-0.16%
	Buy	1/27/2016 8:50:15 AM	USDJPY	¥118.45	($162.60)	$5,257.40	
18	Sell	1/27/2016 6:51:03 AM	USDJPY	¥118.26	100,000	($161.76)	-0.16%
	Buy	1/27/2016 8:50:15 AM	USDJPY	¥118.45	($161.76)	$5,095.64	
19	Sell	1/22/2016 3:00:23 PM	EURCAD	$1.53	100,000	($537.18)	-0.50%
	Buy	1/27/2016 9:35:00 AM	EURCAD	$1.53	($537.18)	$4,558.47	
20	Sell	1/27/2016 8:10:00 AM	EURCAD	$1.53	100,000	($202.24)	-0.19%
	Buy	1/27/2016 9:35:00 AM	EURCAD	$1.53	($202.24)	$4,356.23	
21	Sell	1/27/2016 10:11:03 AM	USDJPY	¥118.50	100,000	($384.18)	-0.38%
	Buy	1/27/2016 12:11:21 PM	USDJPY	¥118.95	($384.18)	$3,972.04	
22	Sell	1/27/2016 10:11:04 AM	USDJPY	¥118.50	100,000	($378.29)	-0.38%
	Buy	1/27/2016 12:11:22 PM	USDJPY	¥118.95	($378.29)	$3,593.75	
23	Sell	1/27/2016 2:03:50 PM	USDJPY	¥118.81	100,000	$141.51	0.14%
	Buy	1/27/2016 3:42:01 PM	USDJPY	¥118.64	$141.51	$3,735.26	
24	Sell	1/27/2016 2:04:47 PM	USDJPY	¥118.83	100,000	$160.04	0.16%
	Buy	1/27/2016 3:42:04 PM	USDJPY	¥118.64	$160.04	$3,895.31	
25	Buy	1/28/2016 12:08:31 AM	USDJPY	¥118.67	100,000	($41.24)	-0.04%
	Sell	1/28/2016 12:59:20 AM	USDJPY	¥118.62	($41.24)	$3,854.06	
26	Buy	1/28/2016 12:08:31 AM	USDJPY	¥118.67	100,000	($42.09)	-0.04%
	Sell	1/28/2016 12:59:20 AM	USDJPY	¥118.62	($42.09)	$3,811.98	
27	Sell	1/28/2016 1:05:50 AM	EURCAD	$1.54	100,000	$91.95	0.08%
	Buy	1/28/2016 1:30:00 AM	EURCAD	$1.53	$91.95	$3,903.93	
28	Buy	1/28/2016 2:39:09 AM	USDJPY	¥118.75	100,000	$25.25	0.03%
	Sell	1/28/2016 5:13:01 AM	USDJPY	¥118.78	$25.25	$3,929.18	
29	Buy	1/28/2016 2:39:09 AM	USDJPY	¥118.75	100,000	$25.25	0.03%

	Sell	1/28/2016 5:13:01 AM	USDJPY	¥118.78		$25.25	$3,954.42	
30	Buy	1/28/2016 5:29:49 AM	USDJPY	¥118.83	100,000	$25.25		0.03%
	Sell	1/28/2016 8:28:01 AM	USDJPY	¥118.86		$25.25	$3,979.67	
31	Buy	1/28/2016 5:29:49 AM	USDJPY	¥118.83	100,000	$25.25		0.03%
	Sell	1/28/2016 8:28:01 AM	USDJPY	¥118.86		$25.25	$4,004.92	
32	Buy	1/28/2016 9:11:22 AM	USDJPY	¥118.90	100,000	($254.19)		-0.25%
	Sell	1/28/2016 11:55:10 AM	USDJPY	¥118.60		($254.19)	$3,750.72	
33	Buy	1/28/2016 9:11:22 AM	USDJPY	¥118.90	100,000	($254.19)		-0.25%
	Sell	1/28/2016 11:55:10 AM	USDJPY	¥118.60		($254.19)	$3,496.53	
34	Sell	1/29/2016 1:59:06 AM	USDJPY	¥120.65	100,000	($297.30)		-0.30%
	Buy	1/29/2016 7:45:07 AM	USDJPY	¥121.01		($297.30)	$3,199.23	
35	Buy	1/29/2016 7:45:07 AM	USDJPY	¥121.01	100,000	$66.05		0.07%
	Sell	1/29/2016 11:20:33 AM	USDJPY	¥121.09		$66.05	$3,265.28	
36	Sell	1/29/2016 11:20:33 AM	USDJPY	¥121.09	100,000	($25.60)		-0.03%
	Buy	1/29/2016 12:16:03 PM	USDJPY	¥121.12		($25.60)	$3,239.68	
37	Buy	1/28/2016 7:35:05 AM	EURCAD	$1.54	100,000	($1,214.00)		-1.10%
	Sell	1/29/2016 1:10:01 PM	EURCAD	$1.52		($1,214.00)	$2,025.68	
38	Sell	1/29/2016 1:10:01 PM	EURCAD	$1.52	100,000	$16.46		0.02%
	Buy	1/29/2016 1:35:00 PM	EURCAD	$1.52		$16.46	$2,042.14	
39	Buy	1/29/2016 12:16:03 PM	USDJPY	¥121.12	100,000	$28.07		0.03%
	Sell	1/29/2016 2:27:03 PM	USDJPY	¥121.16		$28.07	$2,070.21	
40	Sell	1/29/2016 2:27:03 PM	USDJPY	¥121.16	100,000	($21.47)		-0.02%
	Buy	1/29/2016 2:43:09 PM	USDJPY	¥121.18		($21.47)	$2,048.74	
41	Buy	1/29/2016 2:43:09 PM	USDJPY	¥121.18	100,000	($138.74)		-0.14%
	Sell	1/29/2016 3:23:34 PM	USDJPY	¥121.01		($138.74)	$1,910.00	
42	Sell	1/29/2016 3:23:34 PM	USDJPY	¥121.01	100,000	($77.63)		-0.08%
	Buy	1/29/2016 3:53:54 PM	USDJPY	¥121.11		($77.63)	$1,832.37	
43	Buy	1/29/2016 3:53:54 PM	USDJPY	¥121.11	100,000	($88.45)		-0.09%
	Sell	2/1/2016 1:01:24 PM	USDJPY	¥121.00		($88.45)	$1,743.93	
44	Buy	2/1/2016 11:49:27 AM	USDJPY	¥121.12	100,000	($47.94)		-0.05%
	Sell	2/1/2016 2:26:58 PM	USDJPY	¥121.06		($47.94)	$1,695.99	
45	Buy	2/2/2016 12:26:20 AM	EURCAD	$1.53	100,000	($189.29)		-0.17%
	Sell	2/2/2016 12:41:17 AM	EURCAD	$1.53		($189.29)	$1,506.69	
46	Sell	1/22/2016 4:33:06 PM	EURUSD	$1.08	100,000	($1,043.40)		-0.99%
	Buy	2/2/2016 1:16:32 AM	EURUSD	$1.09		($1,043.40)	$463.29	
47	Sell	1/22/2016 4:33:06 PM	EURUSD	$1.08	100,000	($1,030.40)		-0.97%
	Buy	2/2/2016 1:26:08 AM	EURUSD	$1.09		($1,030.40)	($567.11)	
48	Sell	2/2/2016 12:31:50 AM	EURUSD	$1.09	100,000	$95.00		0.09%
	Buy	2/2/2016 1:26:50 AM	EURUSD	$1.09		$95.00	($472.11)	
49	Sell	2/2/2016 1:16:30 AM	EURUSD	$1.09	100,000	$28.00		0.03%
	Buy	2/2/2016 1:30:22 AM	EURUSD	$1.09		$28.00	($444.11)	

50	Sell	2/2/2016 1:25:48 AM	EURUSD	$1.09	100,000	$21.00	0.02%
	Buy	2/2/2016 1:30:54 AM	EURUSD	$1.09	$21.00	($423.11)	
51	Sell	2/2/2016 1:26:47 AM	EURUSD	$1.09	100,000	$19.00	0.02%
	Buy	2/2/2016 1:31:23 AM	EURUSD	$1.09	$19.00	($404.11)	
52	Buy	2/2/2016 2:09:04 AM	EURCAD	$1.53	100,000	($27.04)	-0.02%
	Sell	2/2/2016 2:09:05 AM	EURCAD	$1.53	($27.04)	($431.15)	
53	Buy	2/2/2016 3:23:49 AM	EURCAD	$1.53	100,000	($17.08)	-0.02%
	Sell	2/2/2016 3:23:51 AM	EURCAD	$1.53	($17.08)	($448.23)	
54	Buy	2/2/2016 3:24:03 AM	EURCAD	$1.53	100,000	($30.60)	-0.03%
	Sell	2/2/2016 3:24:04 AM	EURCAD	$1.53	($30.60)	($478.83)	
55	Sell	2/2/2016 1:30:20 AM	EURUSD	$1.09	100,000	($130.00)	-0.12%
	Buy	2/2/2016 3:24:18 AM	EURUSD	$1.09	($130.00)	($608.83)	
56	Buy	2/2/2016 3:29:05 AM	EURCAD	$1.53	100,000	($29.18)	-0.03%
	Sell	2/2/2016 3:30:01 AM	EURCAD	$1.53	($29.18)	($638.01)	
57	Sell	2/2/2016 1:30:26 AM	EURUSD	$1.09	100,000	($157.00)	-0.14%
	Buy	2/2/2016 3:38:12 AM	EURUSD	$1.09	($157.00)	($795.01)	
58	Buy	2/2/2016 3:36:16 AM	EURCAD	$1.53	100,000	($20.64)	-0.02%
	Sell	2/2/2016 3:38:20 AM	EURCAD	$1.53	($20.64)	($815.64)	
59	Buy	2/2/2016 3:39:41 AM	EURCAD	$1.53	100,000	($28.47)	-0.03%
	Sell	2/2/2016 3:39:46 AM	EURCAD	$1.53	($28.47)	($844.11)	
60	Sell	2/2/2016 1:31:19 AM	EURUSD	$1.09	100,000	($202.00)	-0.19%
	Buy	2/2/2016 3:39:57 AM	EURUSD	$1.09	($202.00)	($1,046.11)	
61	Sell	2/2/2016 3:24:20 AM	EURUSD	$1.09	100,000	($60.00)	-0.06%
	Buy	2/2/2016 3:40:00 AM	EURUSD	$1.09	($60.00)	($1,106.11)	
62	Buy	2/2/2016 3:40:00 AM	EURCAD	$1.53	100,000	($19.93)	-0.02%
	Sell	2/2/2016 3:40:02 AM	EURCAD	$1.53	($19.93)	($1,126.03)	
63	Sell	2/2/2016 3:38:13 AM	EURUSD	$1.09	100,000	($63.00)	-0.06%
	Buy	2/2/2016 3:46:10 AM	EURUSD	$1.09	($63.00)	($1,189.03)	
64	Buy	2/2/2016 3:56:23 AM	EURCAD	$1.53	100,000	($25.62)	-0.02%
	Sell	2/2/2016 3:56:24 AM	EURCAD	$1.53	($25.62)	($1,214.65)	
65	Sell	2/2/2016 3:39:59 AM	EURUSD	$1.09	100,000	($55.00)	-0.05%
	Buy	2/2/2016 4:01:45 AM	EURUSD	$1.09	($55.00)	($1,269.65)	
66	Buy	2/2/2016 4:01:27 AM	EURCAD	$1.53	100,000	($29.18)	-0.03%
	Sell	2/2/2016 4:01:51 AM	EURCAD	$1.53	($29.18)	($1,298.83)	
67	Sell	2/2/2016 3:40:02 AM	EURUSD	$1.09	100,000	$34.00	0.03%
	Buy	2/2/2016 5:39:28 AM	EURUSD	$1.09	$34.00	($1,264.83)	
68	Sell	2/2/2016 3:56:04 AM	EURUSD	$1.09	100,000	$48.00	0.04%
	Buy	2/2/2016 5:44:26 AM	EURUSD	$1.09	$48.00	($1,216.83)	
69	Sell	2/2/2016 4:01:46 AM	EURUSD	$1.09	100,000	$73.00	0.07%
	Buy	2/2/2016 5:45:27 AM	EURUSD	$1.09	$73.00	($1,143.83)	
70	Sell	2/2/2016 5:26:39 AM	EURUSD	$1.09	100,000	$9.00	0.01%

	Buy	2/2/2016 5:55:38 AM	EURUSD	$1.09	$9.00	($1,134.83)	
71	Sell	2/2/2016 5:43:26 AM	EURUSD	$1.09	100,000	($89.00)	-0.08%
	Buy	2/2/2016 6:56:23 AM	EURUSD	$1.09	($89.00)	($1,223.83)	
72	Sell	2/2/2016 5:45:25 AM	EURUSD	$1.09	100,000	($122.00)	-0.11%
	Buy	2/2/2016 6:58:07 AM	EURUSD	$1.09	($122.00)	($1,345.83)	
73	Sell	2/2/2016 5:55:37 AM	EURUSD	$1.09	100,000	($152.00)	-0.14%
	Buy	2/2/2016 6:59:05 AM	EURUSD	$1.09	($152.00)	($1,497.83)	
74	Sell	2/2/2016 6:56:53 AM	EURUSD	$1.09	100,000	($74.00)	-0.07%
	Buy	2/2/2016 6:59:20 AM	EURUSD	$1.09	($74.00)	($1,571.83)	
75	Sell	2/2/2016 6:58:08 AM	EURUSD	$1.09	100,000	($53.00)	-0.05%
	Buy	2/2/2016 7:02:55 AM	EURUSD	$1.09	($53.00)	($1,624.83)	
76	Sell	2/2/2016 7:38:50 AM	EURCAD	$1.53	100,000	($15.66)	-0.01%
	Buy	2/2/2016 7:39:06 AM	EURCAD	$1.53	($15.66)	($1,640.49)	
77	Sell	2/2/2016 7:40:11 AM	EURCAD	$1.53	100,000	($24.20)	-0.02%
	Buy	2/2/2016 7:40:12 AM	EURCAD	$1.53	($24.20)	($1,664.68)	
78	Sell	2/2/2016 7:42:12 AM	EURCAD	$1.53	100,000	($29.18)	-0.03%
	Buy	2/2/2016 7:42:13 AM	EURCAD	$1.53	($29.18)	($1,693.86)	
79	Sell	2/2/2016 6:59:07 AM	EURUSD	$1.09	100,000	$78.00	0.07%
	Buy	2/2/2016 8:00:19 AM	EURUSD	$1.09	$78.00	($1,615.86)	
80	Sell	2/2/2016 8:01:30 AM	EURCAD	$1.53	100,000	($27.04)	-0.02%
	Buy	2/2/2016 8:01:30 AM	EURCAD	$1.53	($27.04)	($1,642.90)	
81	Sell	2/2/2016 6:59:21 AM	EURUSD	$1.09	100,000	$108.00	0.10%
	Buy	2/2/2016 8:01:31 AM	EURUSD	$1.09	$108.00	($1,534.90)	
82	Sell	2/2/2016 7:05:14 AM	EURUSD	$1.09	100,000	($21.00)	-0.02%
	Buy	2/2/2016 8:23:08 AM	EURUSD	$1.09	($21.00)	($1,555.90)	
83	Sell	2/2/2016 8:00:05 AM	EURUSD	$1.09	100,000	($158.00)	-0.14%
	Buy	2/2/2016 8:23:17 AM	EURUSD	$1.09	($158.00)	($1,713.90)	
84	Sell	2/2/2016 8:01:30 AM	EURUSD	$1.09	100,000	($187.00)	-0.17%
	Buy	2/2/2016 8:25:22 AM	EURUSD	$1.09	($187.00)	($1,900.90)	
85	Sell	2/2/2016 8:23:09 AM	EURUSD	$1.09	100,000	($65.00)	-0.06%
	Buy	2/2/2016 8:28:34 AM	EURUSD	$1.09	($65.00)	($1,965.90)	
86	Buy	2/2/2016 8:32:14 AM	EURCAD	$1.53	100,000	($26.33)	-0.02%
	Sell	2/2/2016 8:32:16 AM	EURCAD	$1.53	($26.33)	($1,992.23)	
87	Buy	2/2/2016 8:32:43 AM	EURCAD	$1.53	100,000	($24.20)	-0.02%
	Sell	2/2/2016 8:32:47 AM	EURCAD	$1.53	($24.20)	($2,016.43)	
88	Sell	2/2/2016 8:23:20 AM	EURUSD	$1.09	100,000	($51.00)	-0.05%
	Buy	2/2/2016 8:40:07 AM	EURUSD	$1.09	($51.00)	($2,067.43)	
89	Buy	2/2/2016 8:40:30 AM	EURCAD	$1.53	100,000	($8.54)	-0.01%
	Sell	2/2/2016 8:40:38 AM	EURCAD	$1.53	($8.54)	($2,075.97)	
90	Buy	2/2/2016 8:41:07 AM	EURCAD	$1.53	100,000	($22.77)	-0.02%
	Sell	2/2/2016 8:41:09 AM	EURCAD	$1.53	($22.77)	($2,098.74)	

91	Buy	2/2/2016 8:50:48 AM	EURCAD	$1.54	100,000	($23.48)	-0.02%
	Sell	2/2/2016 8:50:48 AM	EURCAD	$1.53	($23.48)	($2,122.22)	
92	Buy	2/2/2016 8:51:30 AM	EURCAD	$1.54	100,000	($27.75)	-0.03%
	Sell	2/2/2016 8:51:33 AM	EURCAD	$1.54	($27.75)	($2,149.98)	
93	Sell	2/2/2016 8:25:31 AM	EURUSD	$1.09	100,000	($56.00)	-0.05%
	Buy	2/2/2016 8:56:41 AM	EURUSD	$1.09	($56.00)	($2,205.98)	
94	Buy	2/2/2016 8:56:53 AM	EURCAD	$1.54	100,000	($5.69)	-0.01%
	Sell	2/2/2016 8:56:57 AM	EURCAD	$1.54	($5.69)	($2,211.67)	
95	Sell	2/2/2016 8:28:35 AM	EURUSD	$1.09	100,000	($61.00)	-0.06%
	Buy	2/2/2016 8:57:16 AM	EURUSD	$1.09	($61.00)	($2,272.67)	
96	Buy	2/2/2016 8:57:16 AM	EURCAD	$1.54	100,000	($5.69)	-0.01%
	Sell	2/2/2016 8:57:17 AM	EURCAD	$1.54	($5.69)	($2,278.36)	
97	Sell	2/2/2016 8:40:08 AM	EURUSD	$1.09	100,000	($71.00)	-0.06%
	Buy	2/2/2016 8:57:18 AM	EURUSD	$1.09	($71.00)	($2,349.36)	
98	Buy	2/2/2016 8:57:24 AM	EURCAD	$1.54	100,000	$27.04	0.02%
	Sell	2/2/2016 8:57:26 AM	EURCAD	$1.54	$27.04	($2,322.33)	
99	Buy	2/2/2016 8:57:26 AM	EURCAD	$1.54	100,000	($31.31)	-0.03%
	Sell	2/2/2016 8:57:26 AM	EURCAD	$1.54	($31.31)	($2,353.64)	
100	Sell	2/2/2016 8:56:44 AM	EURUSD	$1.09	100,000	($78.00)	-0.07%
	Buy	2/2/2016 8:59:47 AM	EURUSD	$1.09	($78.00)	($2,431.64)	
101	Buy	2/2/2016 9:00:03 AM	EURCAD	$1.54	100,000	($29.18)	-0.03%
	Sell	2/2/2016 9:00:04 AM	EURCAD	$1.54	($29.18)	($2,460.81)	
102	Buy	2/2/2016 9:10:16 AM	EURCAD	$1.54	100,000	($20.64)	-0.02%
	Sell	2/2/2016 9:10:20 AM	EURCAD	$1.54	($20.64)	($2,481.45)	
103	Sell	2/2/2016 8:57:17 AM	EURUSD	$1.09	100,000	($55.00)	-0.05%
	Buy	2/2/2016 9:39:49 AM	EURUSD	$1.09	($55.00)	($2,536.45)	
104	Buy	2/2/2016 9:50:33 AM	EURCAD	$1.54	100,000	($27.04)	-0.02%
	Sell	2/2/2016 9:50:33 AM	EURCAD	$1.54	($27.04)	($2,563.49)	
105	Sell	2/2/2016 8:57:18 AM	EURUSD	$1.09	100,000	($52.00)	-0.05%
	Buy	2/2/2016 9:50:38 AM	EURUSD	$1.09	($52.00)	($2,615.49)	
106	Sell	2/2/2016 8:59:49 AM	EURUSD	$1.09	100,000	$151.00	0.14%
	Buy	2/2/2016 10:14:16 AM	EURUSD	$1.09	$151.00	($2,464.49)	
107	Sell	2/2/2016 9:47:00 AM	EURUSD	$1.09	100,000	$162.00	0.15%
	Buy	2/2/2016 10:28:13 AM	EURUSD	$1.09	$162.00	($2,302.49)	
108	Sell	2/2/2016 9:50:38 AM	EURUSD	$1.09	100,000	$164.00	0.15%
	Buy	2/2/2016 10:46:19 AM	EURUSD	$1.09	$164.00	($2,138.49)	
109	Sell	2/2/2016 10:14:15 AM	EURUSD	$1.09	100,000	$25.00	0.02%
	Buy	2/2/2016 10:48:04 AM	EURUSD	$1.09	$25.00	($2,113.49)	
110	Sell	2/2/2016 10:28:12 AM	EURUSD	$1.09	100,000	$36.00	0.03%
	Buy	2/2/2016 10:50:04 AM	EURUSD	$1.09	$36.00	($2,077.49)	
111	Sell	2/2/2016 10:46:16 AM	EURUSD	$1.09	100,000	$65.00	0.06%

	Buy	2/2/2016 10:50:26 AM	EURUSD	$1.09	$65.00	($2,012.49)	
112	Sell	2/2/2016 10:48:00 AM	EURUSD	$1.09	100,000	$61.00	0.06%
	Buy	2/2/2016 10:52:37 AM	EURUSD	$1.09	$61.00	($1,951.49)	
113	Sell	2/2/2016 10:50:04 AM	EURUSD	$1.09	100,000	$92.00	0.08%
	Buy	2/2/2016 10:53:20 AM	EURUSD	$1.09	$92.00	($1,859.49)	
114	Sell	2/2/2016 10:50:22 AM	EURUSD	$1.09	100,000	$125.00	0.11%
	Buy	2/2/2016 10:55:35 AM	EURUSD	$1.09	$125.00	($1,734.49)	
115	Sell	2/2/2016 10:52:36 AM	EURUSD	$1.09	100,000	$125.00	0.11%
	Buy	2/2/2016 10:56:35 AM	EURUSD	$1.09	$125.00	($1,609.49)	
116	Sell	2/2/2016 10:53:19 AM	EURUSD	$1.09	100,000	($15.00)	-0.01%
	Buy	2/2/2016 11:45:57 AM	EURUSD	$1.09	($15.00)	($1,624.49)	
117	Sell	2/2/2016 1:28:52 PM	EURCAD	$1.53	100,000	($32.02)	-0.03%
	Buy	2/2/2016 1:28:52 PM	EURCAD	$1.53	($32.02)	($1,656.52)	
118	Sell	2/2/2016 1:30:23 PM	EURCAD	$1.53	100,000	($19.21)	-0.02%
	Buy	2/2/2016 1:30:25 PM	EURCAD	$1.53	($19.21)	($1,675.73)	
119	Sell	2/2/2016 10:55:34 AM	EURUSD	$1.09	100,000	($266.00)	-0.24%
	Buy	2/2/2016 3:13:41 PM	EURUSD	$1.09	($266.00)	($1,941.73)	
120	Sell	2/2/2016 10:56:32 AM	EURUSD	$1.09	100,000	($291.00)	-0.27%
	Buy	2/2/2016 3:21:56 PM	EURUSD	$1.09	($291.00)	($2,232.73)	
121	Sell	2/2/2016 10:56:46 AM	EURUSD	$1.09	100,000	($326.00)	-0.30%
	Buy	2/2/2016 3:41:02 PM	EURUSD	$1.09	($326.00)	($2,558.73)	
122	Buy	2/2/2016 4:28:08 PM	EURCAD	$1.53	100,000	($22.06)	-0.02%
	Sell	2/2/2016 4:28:39 PM	EURCAD	$1.53	($22.06)	($2,580.79)	
123	Buy	2/2/2016 4:29:41 PM	EURCAD	$1.53	100,000	($8.54)	-0.01%
	Sell	2/2/2016 4:30:12 PM	EURCAD	$1.53	($8.54)	($2,589.33)	
124	Buy	2/2/2016 4:40:43 PM	EURCAD	$1.53	100,000	($37.00)	-0.03%
	Sell	2/2/2016 4:40:48 PM	EURCAD	$1.53	($37.00)	($2,626.34)	
125	Buy	2/2/2016 4:44:35 PM	EURCAD	$1.53	100,000	($34.16)	-0.03%
	Sell	2/2/2016 4:50:56 PM	EURCAD	$1.53	($34.16)	($2,660.50)	
126	Buy	2/2/2016 4:58:46 PM	EURCAD	$1.53	100,000	($34.16)	-0.03%
	Sell	2/2/2016 4:58:48 PM	EURCAD	$1.53	($34.16)	($2,694.65)	
127	Buy	2/3/2016 12:18:15 AM	USDCAD	$1.41	100,000	($18.87)	-0.02%
	Sell	2/3/2016 12:25:22 AM	USDCAD	$1.41	($18.87)	($2,713.52)	
128	Buy	2/3/2016 12:25:22 AM	EURCAD	$1.54	100,000	($28.30)	-0.03%
	Sell	2/3/2016 12:25:35 AM	EURCAD	$1.54	($28.30)	($2,741.83)	
129	Buy	2/3/2016 12:26:20 AM	USDCAD	$1.41	100,000	($16.69)	-0.02%
	Sell	2/3/2016 12:26:59 AM	USDCAD	$1.41	($16.69)	($2,758.52)	
130	Buy	2/3/2016 12:27:02 AM	USDCAD	$1.41	100,000	($10.89)	-0.01%
	Sell	2/3/2016 12:27:08 AM	USDCAD	$1.41	($10.89)	($2,769.41)	
131	Buy	2/3/2016 12:27:07 AM	EURCAD	$1.54	100,000	($30.48)	-0.03%
	Sell	2/3/2016 12:27:12 AM	EURCAD	$1.54	($30.48)	($2,799.89)	

132	Buy	2/3/2016 12:27:11 AM	USDCAD	$1.41	100,000	($10.89)	-0.01%
	Sell	2/3/2016 12:27:19 AM	USDCAD	$1.41	($10.89)	($2,810.78)	
133	Buy	2/3/2016 12:27:22 AM	USDCAD	$1.41	100,000	($73.30)	-0.07%
	Sell	2/3/2016 12:52:36 AM	USDCAD	$1.41	($73.30)	($2,884.08)	
134	Buy	2/3/2016 12:27:28 AM	EURCAD	$1.54	100,000	($146.60)	-0.13%
	Sell	2/3/2016 12:52:46 AM	EURCAD	$1.54	($146.60)	($3,030.68)	
135	Sell	2/3/2016 1:26:14 AM	USDCAD	$1.41	100,000	($16.69)	-0.02%
	Buy	2/3/2016 1:26:20 AM	USDCAD	$1.41	($16.69)	($3,047.37)	
136	Sell	2/3/2016 1:26:44 AM	USDCAD	$1.41	100,000	($13.06)	-0.01%
	Buy	2/3/2016 1:26:45 AM	USDCAD	$1.41	($13.06)	($3,060.44)	
137	Sell	2/3/2016 1:26:49 AM	USDCAD	$1.41	100,000	($13.79)	-0.01%
	Buy	2/3/2016 1:27:30 AM	USDCAD	$1.41	($13.79)	($3,074.23)	
138	Sell	2/3/2016 1:27:47 AM	USDCAD	$1.41	100,000	($18.87)	-0.02%
	Buy	2/3/2016 1:27:49 AM	USDCAD	$1.41	($18.87)	($3,093.10)	
139	Sell	2/3/2016 1:28:02 AM	USDCAD	$1.41	100,000	($11.61)	-0.01%
	Buy	2/3/2016 1:29:02 AM	USDCAD	$1.41	($11.61)	($3,104.71)	
140	Sell	2/3/2016 1:29:57 AM	USDCAD	$1.41	100,000	($14.52)	-0.01%
	Buy	2/3/2016 1:34:53 AM	USDCAD	$1.41	($14.52)	($3,119.23)	
141	Sell	2/3/2016 1:34:54 AM	EURCAD	$1.54	100,000	($33.39)	-0.03%
	Buy	2/3/2016 1:35:04 AM	EURCAD	$1.54	($33.39)	($3,152.61)	
142	Sell	2/3/2016 1:47:07 AM	EURCAD	$1.54	100,000	($29.03)	-0.03%
	Buy	2/3/2016 1:47:08 AM	EURCAD	$1.54	($29.03)	($3,181.64)	
143	Sell	2/3/2016 1:37:02 AM	USDCAD	$1.41	100,000	($2.18)	-0.00%
	Buy	2/3/2016 1:47:36 AM	USDCAD	$1.41	($2.18)	($3,183.82)	
144	Sell	2/3/2016 1:47:41 AM	EURCAD	$1.54	100,000	($34.11)	-0.03%
	Buy	2/3/2016 1:47:41 AM	EURCAD	$1.54	($34.11)	($3,217.93)	
145	Sell	2/3/2016 1:48:06 AM	USDCAD	$1.41	100,000	($8.71)	-0.01%
	Buy	2/3/2016 1:48:44 AM	USDCAD	$1.41	($8.71)	($3,226.64)	
146	Sell	2/3/2016 2:00:27 AM	EURCAD	$1.54	100,000	$6.53	0.01%
	Buy	2/3/2016 2:00:34 AM	EURCAD	$1.54	$6.53	($3,220.11)	
147	Sell	2/3/2016 2:00:58 AM	USDCAD	$1.41	100,000	($13.79)	-0.01%
	Buy	2/3/2016 2:01:03 AM	USDCAD	$1.41	($13.79)	($3,233.90)	
148	Sell	2/3/2016 2:00:34 AM	EURCAD	$1.54	100,000	($23.22)	-0.02%
	Buy	2/3/2016 2:01:06 AM	EURCAD	$1.54	($23.22)	($3,257.12)	
149	Sell	2/3/2016 2:01:07 AM	USDCAD	$1.41	100,000	($13.06)	-0.01%
	Buy	2/3/2016 2:01:33 AM	USDCAD	$1.41	($13.06)	($3,270.19)	
150	Sell	2/3/2016 2:01:29 AM	EURCAD	$1.54	100,000	$0.00	0.00%
	Buy	2/3/2016 2:01:35 AM	EURCAD	$1.54	$0.00	($3,270.19)	
151	Sell	2/3/2016 2:01:35 AM	EURCAD	$1.54	100,000	($22.50)	-0.02%
	Buy	2/3/2016 2:01:38 AM	EURCAD	$1.54	($22.50)	($3,292.68)	
152	Sell	2/3/2016 2:01:38 AM	USDCAD	$1.41	100,000	($7.26)	-0.01%

	Buy	2/3/2016 2:01:51 AM	USDCAD	$1.41		($7.26)	($3,299.94)	
153	Sell	2/3/2016 2:02:05 AM	USDCAD	$1.41	100,000	($2.90)	-0.00%
	Buy	2/3/2016 2:02:12 AM	USDCAD	$1.41		($2.90)	($3,302.85)	
154	Sell	2/3/2016 2:02:12 AM	USDCAD	$1.41	100,000	($14.52)	-0.01%
	Buy	2/3/2016 2:06:08 AM	USDCAD	$1.41		($14.52)	($3,317.36)	
155	Sell	2/3/2016 2:09:31 AM	EURCAD	$1.53	100,000	($31.21)	-0.03%
	Buy	2/3/2016 2:09:31 AM	EURCAD	$1.53		($31.21)	($3,348.57)	
156	Sell	2/3/2016 2:09:31 AM	USDCAD	$1.41	100,000	($13.79)	-0.01%
	Buy	2/3/2016 2:16:24 AM	USDCAD	$1.41		($13.79)	($3,362.36)	
157	Sell	2/3/2016 2:16:36 AM	EURCAD	$1.53	100,000	($30.48)	-0.03%
	Buy	2/3/2016 2:16:51 AM	EURCAD	$1.53		($30.48)	($3,392.84)	
158	Sell	2/3/2016 2:36:31 AM	EURCAD	$1.53	100,000	($24.68)	-0.02%
	Buy	2/3/2016 2:36:35 AM	EURCAD	$1.53		($24.68)	($3,417.52)	
159	Sell	2/3/2016 2:41:42 AM	EURCAD	$1.53	100,000	($20.32)	-0.02%
	Buy	2/3/2016 2:41:48 AM	EURCAD	$1.53		($20.32)	($3,437.84)	
160	Sell	2/3/2016 2:42:58 AM	USDCAD	$1.41	100,000	($13.79)	-0.01%
	Buy	2/3/2016 2:43:09 AM	USDCAD	$1.41		($13.79)	($3,451.63)	
161	Sell	2/3/2016 2:43:42 AM	USDCAD	$1.41	100,000	($15.97)	-0.02%
	Buy	2/3/2016 2:45:31 AM	USDCAD	$1.41		($15.97)	($3,467.59)	
162	Sell	2/3/2016 2:45:25 AM	EURCAD	$1.53	100,000	($31.21)	-0.03%
	Buy	2/3/2016 2:45:40 AM	EURCAD	$1.53		($31.21)	($3,498.80)	
163	Sell	2/3/2016 2:46:00 AM	USDCAD	$1.41	100,000	($10.16)	-0.01%
	Buy	2/3/2016 2:47:45 AM	USDCAD	$1.41		($10.16)	($3,508.96)	
164	Sell	2/3/2016 2:48:23 AM	EURCAD	$1.53	100,000	($28.30)	-0.03%
	Buy	2/3/2016 2:48:23 AM	EURCAD	$1.53		($28.30)	($3,537.27)	
165	Sell	2/3/2016 2:48:04 AM	USDCAD	$1.40	100,000	($13.06)	-0.01%
	Buy	2/3/2016 2:48:23 AM	USDCAD	$1.41		($13.06)	($3,550.33)	
166	Sell	2/3/2016 2:48:41 AM	USDCAD	$1.40	100,000	($7.98)	-0.01%
	Buy	2/3/2016 2:49:23 AM	USDCAD	$1.40		($7.98)	($3,558.31)	
167	Sell	2/3/2016 2:50:06 AM	EURCAD	$1.53	100,000	($29.03)	-0.03%
	Buy	2/3/2016 2:50:09 AM	EURCAD	$1.53		($29.03)	($3,587.34)	
168	Sell	2/3/2016 2:50:06 AM	USDCAD	$1.40	100,000	($15.24)	-0.01%
	Buy	2/3/2016 2:50:12 AM	USDCAD	$1.40		($15.24)	($3,602.59)	
169	Sell	2/3/2016 2:55:56 AM	USDCAD	$1.40	100,000	($15.24)	-0.01%
	Buy	2/3/2016 2:56:15 AM	USDCAD	$1.40		($15.24)	($3,617.83)	
170	Sell	2/3/2016 2:57:23 AM	EURCAD	$1.53	100,000	($22.50)	-0.02%
	Buy	2/3/2016 2:57:26 AM	EURCAD	$1.53		($22.50)	($3,640.33)	
171	Sell	2/3/2016 2:58:03 AM	EURCAD	$1.53	100,000	($27.58)	-0.02%
	Buy	2/3/2016 2:58:13 AM	EURCAD	$1.53		($27.58)	($3,667.90)	
172	Sell	2/3/2016 2:58:00 AM	USDCAD	$1.40	100,000	($14.52)	-0.01%
	Buy	2/3/2016 2:58:27 AM	USDCAD	$1.40		($14.52)	($3,682.42)	

173	Sell	2/3/2016 2:58:54 AM	EURCAD	$1.53	100,000	($31.93)	-0.03%
	Buy	2/3/2016 2:58:54 AM	EURCAD	$1.53	($31.93)	($3,714.35)	
174	Sell	2/3/2016 2:58:39 AM	USDCAD	$1.40	100,000	($12.34)	-0.01%
	Buy	2/3/2016 2:59:20 AM	USDCAD	$1.40	($12.34)	($3,726.69)	
175	Sell	2/3/2016 3:00:01 AM	EURCAD	$1.53	100,000	$0.00	0.00%
	Buy	2/3/2016 3:00:05 AM	EURCAD	$1.53	$0.00	($3,726.69)	
176	Sell	2/3/2016 3:00:03 AM	USDCAD	$1.40	100,000	($7.26)	-0.01%
	Buy	2/3/2016 3:00:06 AM	USDCAD	$1.40	($7.26)	($3,733.95)	
177	Sell	2/3/2016 3:00:07 AM	USDCAD	$1.40	100,000	($13.79)	-0.01%
	Buy	2/3/2016 3:00:13 AM	USDCAD	$1.40	($13.79)	($3,747.74)	
178	Sell	2/3/2016 3:01:06 AM	EURCAD	$1.53	100,000	($8.71)	-0.01%
	Buy	2/3/2016 3:01:55 AM	EURCAD	$1.53	($8.71)	($3,756.45)	
179	Sell	2/3/2016 3:01:51 AM	USDCAD	$1.40	100,000	($0.73)	-0.00%
	Buy	2/3/2016 3:02:00 AM	USDCAD	$1.40	($0.73)	($3,757.17)	
180	Sell	2/3/2016 3:02:00 AM	USDCAD	$1.40	100,000	($145.15)	-0.14%
	Buy	2/3/2016 3:08:11 AM	USDCAD	$1.41	($145.15)	($3,902.33)	
181	Sell	2/3/2016 3:50:55 AM	USDCAD	$1.40	100,000	($7.98)	-0.01%
	Buy	2/3/2016 3:51:09 AM	USDCAD	$1.40	($7.98)	($3,910.31)	
182	Sell	2/3/2016 3:51:35 AM	USDCAD	$1.40	100,000	($13.79)	-0.01%
	Buy	2/3/2016 3:54:02 AM	USDCAD	$1.40	($13.79)	($3,924.10)	
183	Sell	2/3/2016 3:54:03 AM	EURCAD	$1.53	100,000	($29.76)	-0.03%
	Buy	2/3/2016 3:54:03 AM	EURCAD	$1.53	($29.76)	($3,953.85)	
184	Sell	2/3/2016 3:58:04 AM	USDCAD	$1.40	100,000	($13.06)	-0.01%
	Buy	2/3/2016 3:58:05 AM	USDCAD	$1.40	($13.06)	($3,966.92)	
185	Sell	2/3/2016 3:58:17 AM	EURCAD	$1.53	100,000	($22.50)	-0.02%
	Buy	2/3/2016 3:58:19 AM	EURCAD	$1.53	($22.50)	($3,989.42)	
186	Sell	2/3/2016 3:58:17 AM	USDCAD	$1.40	100,000	($9.43)	-0.01%
	Buy	2/3/2016 3:58:19 AM	USDCAD	$1.40	($9.43)	($3,998.85)	
187	Sell	2/3/2016 4:05:36 AM	EURCAD	$1.53	100,000	($10.16)	-0.01%
	Buy	2/3/2016 4:05:43 AM	EURCAD	$1.53	($10.16)	($4,009.01)	
188	Sell	2/3/2016 4:05:42 AM	USDCAD	$1.40	100,000	($13.79)	-0.01%
	Buy	2/3/2016 4:06:51 AM	USDCAD	$1.40	($13.79)	($4,022.80)	
189	Sell	2/3/2016 4:08:04 AM	USDCAD	$1.40	100,000	($20.32)	-0.02%
	Buy	2/3/2016 4:08:09 AM	USDCAD	$1.40	($20.32)	($4,043.12)	
190	Sell	2/3/2016 4:08:08 AM	EURCAD	$1.53	100,000	($14.52)	-0.01%
	Buy	2/3/2016 4:09:26 AM	EURCAD	$1.53	($14.52)	($4,057.64)	
191	Sell	2/3/2016 4:09:25 AM	USDCAD	$1.40	100,000	($13.79)	-0.01%
	Buy	2/3/2016 4:09:26 AM	USDCAD	$1.40	($13.79)	($4,071.43)	
192	Sell	2/3/2016 4:10:35 AM	EURCAD	$1.53	100,000	($29.76)	-0.03%
	Buy	2/3/2016 4:10:38 AM	EURCAD	$1.53	($29.76)	($4,101.18)	
193	Sell	2/3/2016 4:10:45 AM	USDCAD	$1.40	100,000	($12.34)	-0.01%

	Buy	2/3/2016 4:10:56 AM	USDCAD	$1.40	($12.34)	($4,113.52)	
194	Sell	2/3/2016 4:11:08 AM	USDCAD	$1.40	100,000	($12.34)	-0.01%
	Buy	2/3/2016 4:11:16 AM	USDCAD	$1.40	($12.34)	($4,125.86)	
195	Sell	2/3/2016 6:19:02 AM	EURCAD	$1.53	100,000	($28.30)	-0.03%
	Buy	2/3/2016 6:19:07 AM	EURCAD	$1.53	($28.30)	($4,154.17)	
196	Sell	2/3/2016 6:20:16 AM	EURCAD	$1.53	100,000	($26.85)	-0.02%
	Buy	2/3/2016 6:20:18 AM	EURCAD	$1.53	($26.85)	($4,181.02)	
197	Sell	2/3/2016 6:21:16 AM	EURCAD	$1.53	100,000	($22.50)	-0.02%
	Buy	2/3/2016 6:21:19 AM	EURCAD	$1.53	($22.50)	($4,203.52)	
198	Sell	2/3/2016 6:23:27 AM	EURCAD	$1.53	100,000	($23.95)	-0.02%
	Buy	2/3/2016 6:23:28 AM	EURCAD	$1.53	($23.95)	($4,227.47)	
199	Sell	2/3/2016 6:23:38 AM	EURCAD	$1.53	100,000	($11.61)	-0.01%
	Buy	2/3/2016 6:23:40 AM	EURCAD	$1.53	($11.61)	($4,239.08)	
200	Sell	2/3/2016 6:42:59 AM	EURCAD	$1.53	100,000	$15.96	0.01%
	Buy	2/3/2016 6:43:17 AM	EURCAD	$1.53	$15.96	($4,223.12)	
201	Sell	2/3/2016 6:43:22 AM	EURCAD	$1.52	100,000	$5.08	0.00%
	Buy	2/3/2016 6:43:47 AM	EURCAD	$1.52	$5.08	($4,218.04)	
202	Sell	2/3/2016 6:43:47 AM	EURCAD	$1.52	100,000	($34.11)	-0.03%
	Buy	2/3/2016 6:43:48 AM	EURCAD	$1.52	($34.11)	($4,252.15)	
203	Sell	2/3/2016 6:44:29 AM	EURCAD	$1.52	100,000	($29.76)	-0.03%
	Buy	2/3/2016 6:44:31 AM	EURCAD	$1.52	($29.76)	($4,281.90)	
204	Sell	2/3/2016 6:45:08 AM	EURCAD	$1.52	100,000	($2.90)	-0.00%
	Buy	2/3/2016 7:03:30 AM	EURCAD	$1.52	($2.90)	($4,284.81)	
205	Sell	2/3/2016 7:05:01 AM	EURCAD	$1.52	100,000	($29.03)	-0.03%
	Buy	2/3/2016 7:05:02 AM	EURCAD	$1.52	($29.03)	($4,313.84)	
206	Sell	2/3/2016 7:05:40 AM	EURCAD	$1.52	100,000	($30.48)	-0.03%
	Buy	2/3/2016 7:05:44 AM	EURCAD	$1.52	($30.48)	($4,344.32)	
207	Sell	2/3/2016 7:10:14 AM	EURCAD	$1.52	100,000	($31.93)	-0.03%
	Buy	2/3/2016 7:10:15 AM	EURCAD	$1.52	($31.93)	($4,376.25)	
208	Sell	2/3/2016 7:10:53 AM	EURCAD	$1.52	100,000	($21.05)	-0.02%
	Buy	2/3/2016 7:10:58 AM	EURCAD	$1.52	($21.05)	($4,397.30)	
209	Sell	2/3/2016 8:57:00 AM	EURCAD	$1.52	100,000	($29.76)	-0.03%
	Buy	2/3/2016 8:57:01 AM	EURCAD	$1.52	($29.76)	($4,427.06)	
210	Sell	2/3/2016 9:00:19 AM	EURCAD	$1.52	100,000	($40.64)	-0.04%
	Buy	2/3/2016 9:00:20 AM	EURCAD	$1.52	($40.64)	($4,467.70)	
211	Sell	2/3/2016 9:09:51 AM	EURCAD	$1.52	100,000	($27.58)	-0.03%
	Buy	2/3/2016 9:09:52 AM	EURCAD	$1.52	($27.58)	($4,495.28)	
212	Sell	2/3/2016 9:11:27 AM	EURCAD	$1.52	100,000	($29.03)	-0.03%
	Buy	2/3/2016 9:11:28 AM	EURCAD	$1.52	($29.03)	($4,524.31)	
213	Buy	2/3/2016 9:54:22 AM	EURCAD	$1.53	100,000	($35.56)	-0.03%
	Sell	2/3/2016 9:54:56 AM	EURCAD	$1.53	($35.56)	($4,559.87)	

214	Buy	2/3/2016 9:55:01 AM	EURCAD	$1.53	100,000	($25.40)	-0.02%
	Sell	2/3/2016 9:55:03 AM	EURCAD	$1.53	($25.40)	($4,585.27)	
215	Buy	2/3/2016 9:55:23 AM	EURCAD	$1.53	100,000	($46.45)	-0.04%
	Sell	2/3/2016 9:55:30 AM	EURCAD	$1.53	($46.45)	($4,631.72)	
216	Buy	2/3/2016 9:55:35 AM	EURCAD	$1.53	100,000	($32.66)	-0.03%
	Sell	2/3/2016 9:55:37 AM	EURCAD	$1.53	($32.66)	($4,664.38)	
217	Buy	2/3/2016 10:00:29 AM	EURCAD	$1.53	100,000	($39.19)	-0.04%
	Sell	2/3/2016 10:00:33 AM	EURCAD	$1.53	($39.19)	($4,703.57)	
218	Buy	2/3/2016 10:00:50 AM	EURCAD	$1.53	100,000	($42.09)	-0.04%
	Sell	2/3/2016 10:00:51 AM	EURCAD	$1.53	($42.09)	($4,745.67)	
219	Buy	2/3/2016 10:09:27 AM	EURCAD	$1.53	100,000	($40.64)	-0.04%
	Sell	2/3/2016 10:09:29 AM	EURCAD	$1.53	($40.64)	($4,786.31)	
220	Buy	2/3/2016 10:10:04 AM	EURCAD	$1.53	100,000	($29.76)	-0.03%
	Sell	2/3/2016 10:10:05 AM	EURCAD	$1.53	($29.76)	($4,816.07)	
221	Buy	2/3/2016 10:10:16 AM	USDCAD	$1.39	100,000	($2.90)	-0.00%
	Sell	2/3/2016 10:10:55 AM	USDCAD	$1.39	($2.90)	($4,818.97)	
222	Buy	2/3/2016 10:12:18 AM	EURCAD	$1.53	100,000	($35.56)	-0.03%
	Sell	2/3/2016 10:12:51 AM	EURCAD	$1.53	($35.56)	($4,854.53)	
223	Buy	2/3/2016 10:13:03 AM	USDCAD	$1.39	100,000	$3.63	0.00%
	Sell	2/3/2016 10:13:47 AM	USDCAD	$1.39	$3.63	($4,850.90)	
224	Buy	2/3/2016 10:14:39 AM	EURCAD	$1.54	100,000	($209.75)	-0.19%
	Sell	2/3/2016 10:15:39 AM	EURCAD	$1.53	($209.75)	($5,060.65)	
225	Buy	2/3/2016 10:15:10 AM	USDCAD	$1.39	100,000	($142.25)	-0.14%
	Sell	2/3/2016 10:15:58 AM	USDCAD	$1.39	($142.25)	($5,202.90)	
226	Buy	2/3/2016 10:15:13 AM	USDCAD	$1.39	100,000	($142.25)	-0.14%
	Sell	2/3/2016 10:16:53 AM	USDCAD	$1.39	($142.25)	($5,345.15)	
227	Buy	2/3/2016 10:30:08 AM	EURCAD	$1.54	100,000	($88.54)	-0.08%
	Sell	2/3/2016 10:30:18 AM	EURCAD	$1.53	($88.54)	($5,433.69)	
228	Buy	2/3/2016 10:30:47 AM	EURCAD	$1.54	100,000	$33.38	0.03%
	Sell	2/3/2016 10:31:01 AM	EURCAD	$1.54	$33.38	($5,400.31)	
229	Buy	2/3/2016 10:30:47 AM	USDCAD	$1.39	100,000	($8.71)	-0.01%
	Sell	2/3/2016 10:31:01 AM	USDCAD	$1.39	($8.71)	($5,409.02)	
230	Buy	2/3/2016 10:30:51 AM	EURCAD	$1.54	100,000	$33.38	0.03%
	Sell	2/3/2016 10:31:12 AM	EURCAD	$1.54	$33.38	($5,375.65)	
231	Buy	2/3/2016 10:31:12 AM	EURCAD	$1.54	100,000	$99.41	0.09%
	Sell	2/3/2016 10:31:18 AM	EURCAD	$1.54	$99.41	($5,276.24)	
232	Buy	2/3/2016 10:31:18 AM	USDCAD	$1.39	100,000	$16.69	0.02%
	Sell	2/3/2016 10:31:29 AM	USDCAD	$1.39	$16.69	($5,259.55)	
233	Buy	2/3/2016 10:31:18 AM	USDCAD	$1.39	100,000	$16.69	0.02%
	Sell	2/3/2016 10:31:30 AM	USDCAD	$1.39	$16.69	($5,242.86)	
234	Buy	2/3/2016 10:31:32 AM	USDCAD	$1.39	100,000	($60.96)	-0.06%

	Sell	2/3/2016 10:31:40 AM	USDCAD	$1.39	($60.96)	($5,303.83)	
235	Buy	2/3/2016 10:34:45 AM	USDCAD	$1.39	100,000	($17.42)	-0.02%
	Sell	2/3/2016 10:34:48 AM	USDCAD	$1.39	($17.42)	($5,321.24)	
236	Buy	2/3/2016 10:37:23 AM	USDCAD	$1.39	100,000	($18.87)	-0.02%
	Sell	2/3/2016 10:37:35 AM	USDCAD	$1.39	($18.87)	($5,340.11)	
237	Buy	2/3/2016 10:38:27 AM	USDCAD	$1.39	100,000	($18.87)	-0.02%
	Sell	2/3/2016 10:38:54 AM	USDCAD	$1.39	($18.87)	($5,358.98)	
238	Buy	2/3/2016 11:57:05 AM	USDCAD	$1.39	100,000	($13.79)	-0.01%
	Sell	2/3/2016 11:57:08 AM	USDCAD	$1.39	($13.79)	($5,372.77)	
239	Sell	2/3/2016 12:05:42 PM	USDCAD	$1.38	100,000	($142.98)	-0.14%
	Buy	2/3/2016 12:33:51 PM	USDCAD	$1.38	($142.98)	($5,515.75)	
240	Buy	2/3/2016 12:40:16 PM	USDCAD	$1.38	100,000	($16.69)	-0.02%
	Sell	2/3/2016 12:40:22 PM	USDCAD	$1.38	($16.69)	($5,532.44)	
241	Buy	2/3/2016 12:43:19 PM	USDCAD	$1.39	100,000	($92.17)	-0.09%
	Sell	2/3/2016 12:54:18 PM	USDCAD	$1.38	($92.17)	($5,624.61)	
242	Sell	2/3/2016 12:59:51 PM	USDCAD	$1.38	100,000	($13.79)	-0.01%
	Buy	2/3/2016 1:00:16 PM	USDCAD	$1.38	($13.79)	($5,638.40)	
243	Sell	2/3/2016 1:02:52 PM	USDCAD	$1.38	100,000	($2.90)	-0.00%
	Buy	2/3/2016 1:03:00 PM	USDCAD	$1.38	($2.90)	($5,641.31)	
244	Sell	2/3/2016 1:05:53 PM	USDCAD	$1.38	100,000	($18.14)	-0.02%
	Buy	2/3/2016 1:05:55 PM	USDCAD	$1.38	($18.14)	($5,659.45)	
245	Sell	2/3/2016 1:06:00 PM	USDCAD	$1.38	100,000	$18.14	0.02%
	Buy	2/3/2016 1:06:05 PM	USDCAD	$1.38	$18.14	($5,641.31)	
246	Sell	2/3/2016 1:06:05 PM	USDCAD	$1.38	100,000	($2.18)	-0.00%
	Buy	2/3/2016 1:07:58 PM	USDCAD	$1.38	($2.18)	($5,643.49)	
247	Sell	2/3/2016 1:07:58 PM	USDCAD	$1.38	100,000	($12.34)	-0.01%
	Buy	2/3/2016 1:08:35 PM	USDCAD	$1.38	($12.34)	($5,655.83)	
248	Sell	2/3/2016 1:10:02 PM	USDCAD	$1.38	100,000	($164.02)	-0.16%
	Buy	2/3/2016 1:28:42 PM	USDCAD	$1.38	($164.02)	($5,819.85)	
249	Sell	2/3/2016 2:06:28 PM	USDCAD	$1.38	100,000	($12.34)	-0.01%
	Buy	2/3/2016 2:06:29 PM	USDCAD	$1.38	($12.34)	($5,832.19)	
250	Sell	2/3/2016 2:07:09 PM	USDCAD	$1.38	100,000	($6.53)	-0.01%
	Buy	2/3/2016 2:07:09 PM	USDCAD	$1.38	($6.53)	($5,838.72)	
251	Sell	2/3/2016 2:07:27 PM	USDCAD	$1.38	100,000	$5.08	0.01%
	Buy	2/3/2016 2:07:28 PM	USDCAD	$1.38	$5.08	($5,833.64)	
252	Sell	2/3/2016 2:07:28 PM	USDCAD	$1.38	100,000	$21.04	0.02%
	Buy	2/3/2016 2:07:30 PM	USDCAD	$1.38	$21.04	($5,812.60)	
253	Sell	2/3/2016 2:28:21 PM	USDCAD	$1.38	100,000	($15.97)	-0.02%
	Buy	2/3/2016 3:07:10 PM	USDCAD	$1.38	($15.97)	($5,828.56)	
254	Sell	2/3/2016 3:08:32 PM	EURCAD	$1.53	100,000	($27.58)	-0.02%
	Buy	2/3/2016 3:08:35 PM	EURCAD	$1.53	($27.58)	($5,856.14)	

255	Sell	2/3/2016 3:08:33 PM	USDCAD	$1.38	100,000	($15.24)	($5,871.38)	-0.02%
	Buy	2/3/2016 3:09:24 PM	USDCAD	$1.38	($15.24)	($5,871.38)	
256	Sell	2/3/2016 3:10:17 PM	USDCAD	$1.38	100,000	($15.24)		-0.02%
	Buy	2/3/2016 3:10:29 PM	USDCAD	$1.38	($15.24)	($5,886.62)	
257	Sell	2/3/2016 3:10:48 PM	EURCAD	$1.53	100,000	($20.32)		-0.02%
	Buy	2/3/2016 3:10:51 PM	EURCAD	$1.53	($20.32)	($5,906.95)	
258	Sell	2/3/2016 3:12:21 PM	USDCAD	$1.38	100,000	($16.69)		-0.02%
	Buy	2/3/2016 3:12:46 PM	USDCAD	$1.38	($16.69)	($5,923.64)	
259	Sell	2/3/2016 3:17:13 PM	USDCAD	$1.38	100,000	($92.90)		-0.09%
	Buy	2/3/2016 3:29:25 PM	USDCAD	$1.38	($92.90)	($6,016.54)	
260	Sell	2/3/2016 3:53:43 PM	USDCAD	$1.38	100,000	($4.35)		-0.00%
	Buy	2/3/2016 3:53:58 PM	USDCAD	$1.38	($4.35)	($6,020.89)	
261	Sell	2/3/2016 3:54:00 PM	USDCAD	$1.38	100,000	($5.08)		-0.01%
	Buy	2/3/2016 3:54:30 PM	USDCAD	$1.38	($5.08)	($6,025.97)	
262	Sell	2/3/2016 3:59:05 PM	USDCAD	$1.38	100,000	($13.79)		-0.01%
	Buy	2/3/2016 4:00:21 PM	USDCAD	$1.38	($13.79)	($6,039.76)	
263	Sell	2/3/2016 4:00:36 PM	USDCAD	$1.38	100,000	($13.06)		-0.01%
	Buy	2/3/2016 4:01:07 PM	USDCAD	$1.38	($13.06)	($6,052.82)	
264	Sell	2/3/2016 4:01:56 PM	USDCAD	$1.38	100,000	($7.26)		-0.01%
	Buy	2/3/2016 4:02:14 PM	USDCAD	$1.38	($7.26)	($6,060.08)	
265	Sell	2/3/2016 4:04:27 PM	USDCAD	$1.38	100,000	($10.89)		-0.01%
	Buy	2/3/2016 4:04:33 PM	USDCAD	$1.38	($10.89)	($6,070.97)	
266	Buy	2/4/2016 12:07:30 AM	EURCAD	$1.53	100,000	($26.18)		-0.02%
	Sell	2/4/2016 12:07:45 AM	EURCAD	$1.53	($26.18)	($6,097.15)	
267	Buy	2/4/2016 12:07:22 AM	USDCAD	$1.38	100,000	($78.55)		-0.08%
	Sell	2/4/2016 12:18:11 AM	USDCAD	$1.38	($78.55)	($6,175.70)	
268	Sell	2/4/2016 1:10:23 AM	EURCAD	$1.53	100,000	($32.00)		-0.03%
	Buy	2/4/2016 1:12:01 AM	EURCAD	$1.53	($32.00)	($6,207.70)	
269	Sell	2/4/2016 1:31:31 AM	EURCAD	$1.52	100,000	($26.18)		-0.02%
	Buy	2/4/2016 1:31:34 AM	EURCAD	$1.53	($26.18)	($6,233.88)	
270	Sell	2/4/2016 1:37:35 AM	EURCAD	$1.52	100,000	($32.73)		-0.03%
	Buy	2/4/2016 1:37:36 AM	EURCAD	$1.53	($32.73)	($6,266.61)	
271	Sell	2/4/2016 1:40:05 AM	EURCAD	$1.52	100,000	($22.55)		-0.02%
	Buy	2/4/2016 1:40:28 AM	EURCAD	$1.52	($22.55)	($6,289.15)	
272	Sell	2/4/2016 1:42:43 AM	EURCAD	$1.52	100,000	($34.91)		-0.03%
	Buy	2/4/2016 1:42:44 AM	EURCAD	$1.52	($34.91)	($6,324.06)	
273	Sell	2/4/2016 1:44:56 AM	EURCAD	$1.52	100,000	($28.36)		-0.03%
	Buy	2/4/2016 1:45:04 AM	EURCAD	$1.52	($28.36)	($6,352.43)	
274	Buy	2/4/2016 1:38:18 AM	USDCAD	$1.38	100,000	($72.73)		-0.07%
	Sell	2/4/2016 1:48:34 AM	USDCAD	$1.38	($72.73)	($6,425.16)	
275	Sell	2/4/2016 1:52:14 AM	EURCAD	$1.52	100,000	($36.36)		-0.03%

	Buy	2/4/2016 1:52:16 AM	EURCAD	$1.52	($36.36)	($6,461.52)	
276	Sell	2/4/2016 1:57:53 AM	EURCAD	$1.52	100,000	($33.46)	-0.03%
	Buy	2/4/2016 1:57:54 AM	EURCAD	$1.52	($33.46)	($6,494.97)	
277	Buy	2/4/2016 2:25:26 AM	USDCAD	$1.38	100,000	($16.00)	-0.02%
	Sell	2/4/2016 2:25:47 AM	USDCAD	$1.38	($16.00)	($6,510.97)	
278	Buy	2/4/2016 2:25:52 AM	USDCAD	$1.38	100,000	($16.00)	-0.02%
	Sell	2/4/2016 2:26:50 AM	USDCAD	$1.38	($16.00)	($6,526.97)	
279	Buy	2/4/2016 2:30:20 AM	USDCAD	$1.38	100,000	($12.36)	-0.01%
	Sell	2/4/2016 2:30:45 AM	USDCAD	$1.38	($12.36)	($6,539.34)	
280	Buy	2/4/2016 2:30:47 AM	USDCAD	$1.38	100,000	($10.91)	-0.01%
	Sell	2/4/2016 2:30:50 AM	USDCAD	$1.38	($10.91)	($6,550.25)	
281	Buy	2/4/2016 2:35:28 AM	USDCAD	$1.38	100,000	($11.64)	-0.01%
	Sell	2/4/2016 2:35:40 AM	USDCAD	$1.38	($11.64)	($6,561.88)	
282	Buy	2/4/2016 2:35:49 AM	USDCAD	$1.38	100,000	($15.27)	-0.02%
	Sell	2/4/2016 2:41:30 AM	USDCAD	$1.38	($15.27)	($6,577.16)	
283	Buy	2/4/2016 2:44:12 AM	USDCAD	$1.38	100,000	($10.91)	-0.01%
	Sell	2/4/2016 2:44:19 AM	USDCAD	$1.38	($10.91)	($6,588.07)	
284	Buy	2/4/2016 2:44:38 AM	EURCAD	$1.53	100,000	($29.82)	-0.03%
	Sell	2/4/2016 2:44:39 AM	EURCAD	$1.53	($29.82)	($6,617.89)	
285	Buy	2/4/2016 2:44:50 AM	USDCAD	$1.38	100,000	($19.64)	-0.02%
	Sell	2/4/2016 2:45:09 AM	USDCAD	$1.38	($19.64)	($6,637.52)	
286	Buy	2/4/2016 2:55:01 AM	EURCAD	$1.53	100,000	($27.64)	-0.02%
	Sell	2/4/2016 2:55:06 AM	EURCAD	$1.53	($27.64)	($6,665.16)	
287	Buy	2/4/2016 2:56:38 AM	EURCAD	$1.53	100,000	($28.36)	-0.03%
	Sell	2/4/2016 2:56:40 AM	EURCAD	$1.53	($28.36)	($6,693.52)	
288	Buy	2/4/2016 3:01:27 AM	EURCAD	$1.53	100,000	($24.00)	-0.02%
	Sell	2/4/2016 3:01:28 AM	EURCAD	$1.53	($24.00)	($6,717.52)	
289	Buy	2/4/2016 3:01:50 AM	EURCAD	$1.53	100,000	$77.07	0.07%
	Sell	2/4/2016 3:02:00 AM	EURCAD	$1.53	$77.07	($6,640.45)	
290	Buy	2/4/2016 3:02:00 AM	EURCAD	$1.53	100,000	($33.46)	-0.03%
	Sell	2/4/2016 3:02:01 AM	EURCAD	$1.53	($33.46)	($6,673.91)	
291	Buy	2/4/2016 3:02:01 AM	EURCAD	$1.53	100,000	($30.55)	-0.03%
	Sell	2/4/2016 3:02:19 AM	EURCAD	$1.53	($30.55)	($6,704.45)	
292	Buy	2/4/2016 3:09:54 AM	USDCAD	$1.38	100,000	($10.91)	-0.01%
	Sell	2/4/2016 3:10:01 AM	USDCAD	$1.38	($10.91)	($6,715.36)	
293	Buy	2/4/2016 3:13:44 AM	USDCAD	$1.38	100,000	($12.36)	-0.01%
	Sell	2/4/2016 3:14:08 AM	USDCAD	$1.38	($12.36)	($6,727.73)	
294	Buy	2/4/2016 3:15:08 AM	EURCAD	$1.53	100,000	($20.36)	-0.02%
	Sell	2/4/2016 3:15:09 AM	EURCAD	$1.53	($20.36)	($6,748.09)	
295	Buy	2/4/2016 3:17:47 AM	EURCAD	$1.53	100,000	($29.82)	-0.03%
	Sell	2/4/2016 3:17:48 AM	EURCAD	$1.53	($29.82)	($6,777.91)	

296	Buy	2/4/2016 3:17:56 AM	EURCAD	$1.53	100,000	($32.00)	-0.03%
	Sell	2/4/2016 3:20:07 AM	EURCAD	$1.53	($32.00)	($6,809.91)	
297	Sell	2/4/2016 6:23:10 AM	EURCAD	$1.52	100,000	($29.82)	-0.03%
	Buy	2/4/2016 6:23:19 AM	EURCAD	$1.53	($29.82)	($6,839.73)	
298	Buy	2/4/2016 7:21:09 AM	EURCAD	$1.53	100,000	($18.91)	-0.02%
	Sell	2/4/2016 7:21:15 AM	EURCAD	$1.53	($18.91)	($6,858.64)	
299	Buy	2/4/2016 7:25:14 AM	EURCAD	$1.53	100,000	($18.18)	-0.02%
	Sell	2/4/2016 7:25:20 AM	EURCAD	$1.53	($18.18)	($6,876.82)	
300	Buy	2/4/2016 7:30:59 AM	EURCAD	$1.53	100,000	($22.55)	-0.02%
	Sell	2/4/2016 7:31:00 AM	EURCAD	$1.53	($22.55)	($6,899.36)	
301	Buy	2/4/2016 7:31:30 AM	EURCAD	$1.53	100,000	($28.36)	-0.03%
	Sell	2/4/2016 7:31:31 AM	EURCAD	$1.53	($28.36)	($6,927.73)	
302	Buy	2/4/2016 7:31:05 AM	USDCAD	$1.37	100,000	($9.45)	-0.01%
	Sell	2/4/2016 7:31:33 AM	USDCAD	$1.37	($9.45)	($6,937.18)	
303	Buy	2/4/2016 7:31:38 AM	USDCAD	$1.37	100,000	($16.00)	-0.02%
	Sell	2/4/2016 7:31:38 AM	USDCAD	$1.37	($16.00)	($6,953.18)	
304	Buy	2/4/2016 7:31:47 AM	EURCAD	$1.53	100,000	($8.73)	-0.01%
	Sell	2/4/2016 7:32:00 AM	EURCAD	$1.53	($8.73)	($6,961.91)	
305	Buy	2/4/2016 7:32:00 AM	USDCAD	$1.37	100,000	($16.73)	-0.02%
	Sell	2/4/2016 7:32:44 AM	USDCAD	$1.37	($16.73)	($6,978.64)	
306	Buy	2/4/2016 7:36:37 AM	USDCAD	$1.37	100,000	($224.73)	-0.23%
	Sell	2/4/2016 7:42:48 AM	USDCAD	$1.37	($224.73)	($7,203.37)	
307	Buy	2/4/2016 7:32:17 AM	EURCAD	$1.53	100,000	($13.09)	-0.01%
	Sell	2/4/2016 7:56:33 AM	EURCAD	$1.53	($13.09)	($7,216.46)	
308	Buy	2/4/2016 8:00:29 AM	EURCAD	$1.53	100,000	($33.46)	-0.03%
	Sell	2/4/2016 8:00:29 AM	EURCAD	$1.53	($33.46)	($7,249.91)	
309	Buy	2/4/2016 8:02:45 AM	USDCAD	$1.37	100,000	($15.27)	-0.02%
	Sell	2/4/2016 8:02:45 AM	USDCAD	$1.37	($15.27)	($7,265.19)	
310	Buy	2/4/2016 8:03:07 AM	USDCAD	$1.37	100,000	($5.09)	-0.01%
	Sell	2/4/2016 8:03:14 AM	USDCAD	$1.37	($5.09)	($7,270.28)	
311	Buy	2/4/2016 8:03:33 AM	EURCAD	$1.53	100,000	($18.18)	-0.02%
	Sell	2/4/2016 8:03:34 AM	EURCAD	$1.53	($18.18)	($7,288.46)	
312	Buy	2/4/2016 8:03:38 AM	USDCAD	$1.37	100,000	($14.55)	-0.01%
	Sell	2/4/2016 8:03:40 AM	USDCAD	$1.37	($14.55)	($7,303.01)	
313	Buy	2/4/2016 8:04:01 AM	USDCAD	$1.37	100,000	($21.09)	-0.02%
	Sell	2/4/2016 8:04:02 AM	USDCAD	$1.37	($21.09)	($7,324.10)	
314	Buy	2/4/2016 8:04:01 AM	EURCAD	$1.54	100,000	($24.73)	-0.02%
	Sell	2/4/2016 8:04:16 AM	EURCAD	$1.53	($24.73)	($7,348.83)	
315	Buy	2/4/2016 8:04:22 AM	USDCAD	$1.37	100,000	($16.00)	-0.02%
	Sell	2/4/2016 8:04:23 AM	USDCAD	$1.37	($16.00)	($7,364.83)	
316	Buy	2/4/2016 8:04:30 AM	EURCAD	$1.54	100,000	($31.27)	-0.03%

	Sell	2/4/2016 8:04:31 AM	EURCAD	$1.54	($31.27)	($7,396.10)	
317	Buy	2/4/2016 8:05:25 AM	EURCAD	$1.54	100,000	($26.18)	-0.02%
	Sell	2/4/2016 8:05:26 AM	EURCAD	$1.54	($26.18)	($7,422.28)	
318	Buy	2/4/2016 8:09:50 AM	EURCAD	$1.54	100,000	($30.55)	-0.03%
	Sell	2/4/2016 8:09:52 AM	EURCAD	$1.54	($30.55)	($7,452.83)	
319	Buy	2/4/2016 8:10:00 AM	EURCAD	$1.54	100,000	($29.09)	-0.03%
	Sell	2/4/2016 8:10:01 AM	EURCAD	$1.54	($29.09)	($7,481.92)	
320	Buy	2/4/2016 8:10:00 AM	USDCAD	$1.37	100,000	($12.36)	-0.01%
	Sell	2/4/2016 8:10:23 AM	USDCAD	$1.37	($12.36)	($7,494.28)	
321	Sell	2/4/2016 10:18:05 AM	EURCAD	$1.53	100,000	($21.09)	-0.02%
	Buy	2/4/2016 10:18:07 AM	EURCAD	$1.53	($21.09)	($7,515.37)	
322	Buy	2/4/2016 10:24:55 AM	USDCAD	$1.37	100,000	($13.82)	-0.01%
	Sell	2/4/2016 10:24:59 AM	USDCAD	$1.37	($13.82)	($7,529.19)	
323	Buy	2/4/2016 10:26:16 AM	USDCAD	$1.37	100,000	$9.45	0.01%
	Sell	2/4/2016 10:27:25 AM	USDCAD	$1.37	$9.45	($7,519.74)	
324	Buy	2/4/2016 10:27:36 AM	USDCAD	$1.37	100,000	($8.00)	-0.01%
	Sell	2/4/2016 10:27:54 AM	USDCAD	$1.37	($8.00)	($7,527.74)	
325	Buy	2/4/2016 10:28:35 AM	USDCAD	$1.37	100,000	($18.91)	-0.02%
	Sell	2/4/2016 10:29:00 AM	USDCAD	$1.37	($18.91)	($7,546.65)	
326	Buy	2/4/2016 10:29:30 AM	USDCAD	$1.37	100,000	($7.27)	-0.01%
	Sell	2/4/2016 10:30:05 AM	USDCAD	$1.37	($7.27)	($7,553.92)	
327	Buy	2/4/2016 10:45:27 AM	USDCAD	$1.37	100,000	($13.82)	-0.01%
	Sell	2/4/2016 10:45:27 AM	USDCAD	$1.37	($13.82)	($7,567.74)	
328	Buy	2/4/2016 10:45:40 AM	USDCAD	$1.37	100,000	($10.18)	-0.01%
	Sell	2/4/2016 10:46:47 AM	USDCAD	$1.37	($10.18)	($7,577.92)	
329	Buy	2/4/2016 10:48:10 AM	USDCAD	$1.37	100,000	($10.91)	-0.01%
	Sell	2/4/2016 10:56:17 AM	USDCAD	$1.37	($10.91)	($7,588.83)	
330	Buy	2/4/2016 11:05:42 AM	USDCAD	$1.37	100,000	($14.55)	-0.01%
	Sell	2/4/2016 11:05:50 AM	USDCAD	$1.37	($14.55)	($7,603.38)	
331	Buy	2/4/2016 11:06:02 AM	USDCAD	$1.37	100,000	($17.45)	-0.02%
	Sell	2/4/2016 11:06:04 AM	USDCAD	$1.37	($17.45)	($7,620.83)	
332	Buy	2/4/2016 11:13:34 AM	USDCAD	$1.37	100,000	($19.64)	-0.02%
	Sell	2/4/2016 11:14:40 AM	USDCAD	$1.37	($19.64)	($7,640.47)	
333	Buy	2/4/2016 11:14:47 AM	EURCAD	$1.53	100,000	($27.64)	-0.02%
	Sell	2/4/2016 11:14:50 AM	EURCAD	$1.53	($27.64)	($7,668.11)	
334	Buy	2/4/2016 11:16:04 AM	EURCAD	$1.53	100,000	($25.45)	-0.02%
	Sell	2/4/2016 11:16:10 AM	EURCAD	$1.53	($25.45)	($7,693.56)	
335	Buy	2/4/2016 11:16:54 AM	USDCAD	$1.37	100,000	($3.64)	-0.00%
	Sell	2/4/2016 11:17:08 AM	USDCAD	$1.37	($3.64)	($7,697.20)	
336	Buy	2/4/2016 11:18:08 AM	USDCAD	$1.37	100,000	($5.09)	-0.01%
	Sell	2/4/2016 11:19:18 AM	USDCAD	$1.37	($5.09)	($7,702.29)	

337	Buy	2/4/2016 11:19:50 AM	EURCAD	$1.53	100,000	($24.73)	-0.02%
	Sell	2/4/2016 11:19:50 AM	EURCAD	$1.53	($24.73)	($7,727.02)	
338	Buy	2/4/2016 11:19:49 AM	USDCAD	$1.37	100,000	($13.82)	-0.01%
	Sell	2/4/2016 11:19:55 AM	USDCAD	$1.37	($13.82)	($7,740.83)	
339	Buy	2/4/2016 11:20:01 AM	USDCAD	$1.37	100,000	($189.82)	-0.19%
	Sell	2/4/2016 11:26:02 AM	USDCAD	$1.37	($189.82)	($7,930.65)	
340	Buy	2/1/2016 2:07:28 PM	USDJPY	¥121.15	100,000	($4,634.05)	-4.40%
	Sell	2/8/2016 5:12:29 PM	USDJPY	¥115.82	($4,634.05)	($12,564.71)	
341	Sell	2/4/2016 3:15:02 PM	USDCAD	$1.37	100,000	($1,493.08)	-1.51%
	Buy	2/8/2016 5:12:33 PM	USDCAD	$1.39	($1,493.08)	($14,057.78)	
342	Sell	2/2/2016 3:13:43 PM	EURUSD	$1.09	100,000	($2,774.90)	-2.56%
	Buy	2/8/2016 5:44:16 PM	EURUSD	$1.12	($2,774.90)	($16,832.68)	
343	Buy	2/8/2016 5:48:00 PM	EURCHF	CHF1.10	100,000	($30.85)	-0.03%
	Sell	2/8/2016 5:49:38 PM	EURCHF	CHF1.10	($30.85)	($16,863.53)	
344	Sell	2/2/2016 3:21:57 PM	EURUSD	$1.09	100,000	($2,675.90)	-2.46%
	Buy	2/8/2016 7:02:00 PM	EURUSD	$1.12	($2,675.90)	($19,539.43)	
345	Buy	2/8/2016 7:40:00 PM	EURCHF	CHF1.10	100,000	$4.11	0.00%
	Sell	2/8/2016 7:46:16 PM	EURCHF	CHF1.10	$4.11	($19,535.32)	
346	Sell	2/2/2016 3:41:14 PM	EURUSD	$1.09	100,000	($2,796.90)	-2.58%
	Buy	2/8/2016 7:58:20 PM	EURUSD	$1.12	($2,796.90)	($22,332.22)	
347	Sell	2/8/2016 5:44:00 PM	EURUSD	$1.12	100,000	($55.00)	-0.05%
	Buy	2/8/2016 8:13:43 PM	EURUSD	$1.12	($55.00)	($22,387.22)	
348	Sell	2/8/2016 7:02:10 PM	EURUSD	$1.12	100,000	($291.00)	-0.26%
	Buy	2/8/2016 9:45:28 PM	EURUSD	$1.12	($291.00)	($22,678.22)	
349	Sell	2/8/2016 7:58:00 PM	EURUSD	$1.12	100,000	($167.00)	-0.15%
	Buy	2/8/2016 9:46:02 PM	EURUSD	$1.12	($167.00)	($22,845.22)	
350	Sell	2/8/2016 8:12:00 PM	EURUSD	$1.12	100,000	($1,362.00)	-1.23%
	Buy	2/11/2016 1:59:13 PM	EURUSD	$1.13	($1,362.00)	($24,207.22)	
351	Sell	2/8/2016 9:42:01 PM	EURUSD	$1.12	100,000	($1,056.01)	-0.95%
	Buy	2/11/2016 3:44:15 PM	EURUSD	$1.13	($1,056.01)	($25,263.23)	
352	Sell	2/8/2016 9:46:00 PM	EURUSD	$1.12	100,000	($1,052.00)	-0.95%
	Buy	2/11/2016 3:44:15 PM	EURUSD	$1.13	($1,052.00)	($26,315.23)	
353	Sell	2/11/2016 2:29:55 PM	EURUSD	$1.13	100,000	$216.00	0.19%
	Buy	2/11/2016 3:44:15 PM	EURUSD	$1.13	$216.00	($26,099.23)	
354	Buy	2/11/2016 3:44:15 PM	EURUSD	$1.13	200,000	$26.00	0.01%
	Sell	2/11/2016 4:00:32 PM	EURUSD	$1.13	$26.00	($26,073.23)	
355	Sell	2/11/2016 4:00:32 PM	EURUSD	$1.13	300,000	$2,263.20	0.66%
	Buy	2/12/2016 8:46:36 AM	EURUSD	$1.12	$2,263.20	($23,810.03)	
356	Sell	2/12/2016 9:02:38 AM	EURUSD	$1.12	300,000	($195.00)	-0.06%
	Buy	2/12/2016 10:20:04 AM	EURUSD	$1.13	($195.00)	($24,005.03)	
357	Sell	2/12/2016 9:54:06 AM	EURUSD	$1.13	100,000	$114.00	0.10%

	Buy	2/12/2016 1:26:15 PM	EURUSD	$1.12	$114.00	($23,891.03)	
358	Sell	2/12/2016 9:54:06 AM	EURUSD	$1.13	100,000	$361.40	0.32%
	Buy	2/14/2016 9:03:02 PM	EURUSD	$1.12	$361.40	($23,529.63)	
359	Sell	2/12/2016 9:54:06 AM	EURUSD	$1.13	100,000	$1,075.20	0.95%
	Buy	2/16/2016 12:35:47 AM	EURUSD	$1.12	$1,075.20	($22,454.43)	
360	Sell	2/12/2016 1:12:38 PM	EURUSD	$1.12	100,000	$852.20	0.75%
	Buy	2/16/2016 12:35:47 AM	EURUSD	$1.12	$852.20	($21,602.23)	
361	Sell	2/12/2016 1:50:39 PM	EURUSD	$1.12	100,000	$857.20	0.76%
	Buy	2/16/2016 12:35:47 AM	EURUSD	$1.12	$857.20	($20,745.03)	
362	Buy	2/17/2016 8:47:04 AM	EURUSD	$1.11	100,000	$34.00	0.03%
	Sell	2/17/2016 9:42:52 AM	EURUSD	$1.11	$34.00	($20,711.03)	
363	Buy	2/24/2016 7:57:28 AM	EURUSD	$1.10	200,000	$76.00	0.03%
	Sell	2/24/2016 8:01:12 AM	EURUSD	$1.10	$76.00	($20,635.03)	
364	Sell	2/24/2016 8:06:34 AM	EURUSD	$1.10	200,000	$42.00	0.02%
	Buy	2/24/2016 8:26:48 AM	EURUSD	$1.10	$42.00	($20,593.03)	
365	Buy	2/24/2016 8:34:47 AM	EURUSD	$1.10	200,000	$144.00	0.07%
	Sell	2/24/2016 8:45:58 AM	EURUSD	$1.10	$144.00	($20,449.03)	
366	Buy	2/25/2016 8:36:03 AM	EURUSD	$1.10	100,000	$109.00	0.10%
	Sell	2/25/2016 12:38:19 PM	EURUSD	$1.10	$109.00	($20,340.03)	
367	Buy	2/26/2016 8:49:09 AM	EURUSD	$1.10	200,000	($2,317.60)	-1.05%
	Sell	2/29/2016 1:00:56 PM	EURUSD	$1.09	($2,317.60)	($22,657.63)	
368	Buy	3/1/2016 8:00:11 AM	EURUSD	$1.09	100,000	($52.00)	-0.05%
	Sell	3/1/2016 8:08:23 AM	EURUSD	$1.09	($52.00)	($22,709.63)	

Report Release Strategy:

#	Type	Date/Time	Symbol	Price	Shares/Ctrts/Units Profit	Net Profit and Cum Net Profit	%Profit
1	Buy	3/1/2016 8:00:11 AM	EURUSD	$1.09	100,000	($52.00)	-0.05%
	Sell	3/1/2016 8:08:23 AM	EURUSD	$1.09	($52.00)	($52.00)	
2	Buy	3/3/2016 11:40:49 AM	EURUSD	$1.10	200,000	($188.00)	-0.09%
	Sell	3/3/2016 11:44:28 AM	EURUSD	$1.10	($188.00)	($240.00)	
3	Buy	3/1/2016 8:39:46 AM	USDCAD	$1.35	100,000	($649.79)	-0.65%
	Sell	3/3/2016 11:44:28 AM	USDCAD	$1.34	($649.79)	($889.79)	
4	Sell	3/3/2016 11:54:39 AM	EURUSD	$1.09	200,000	$106.00	0.05%
	Buy	3/3/2016 12:13:51 PM	EURUSD	$1.09	$106.00	($783.79)	
5	Buy	3/15/2016 10:12:05 AM	USDCAD	$1.34	100,000	($56.18)	-0.06%
	Sell	3/15/2016 10:32:48 AM	USDCAD	$1.34	($56.18)	($839.96)	
6	Sell	3/16/2016 12:01:31 PM	EURUSD	$1.11	200,000	($166.00)	-0.07%
	Buy	3/16/2016 12:10:32 PM	EURUSD	$1.11	($166.00)	($1,005.96)	
7	Sell	3/16/2016 1:25:17 PM	EURUSD	$1.11	200,000	($212.00)	-0.10%
	Buy	3/16/2016 1:42:44 PM	EURUSD	$1.11	($212.00)	($1,217.96)	
8	Buy	3/18/2016 1:09:20 PM	GBPUSD	$1.45	500,000	$290.00	0.04%

	Sell	3/18/2016 1:23:02 PM	GBPUSD	$1.45	$290.00	($927.96)	

Single Moving Average Strategy Code:

Inputs: Len(70);
Vars: MA(0);

```
MA = Average(Close,Len);
If Close > MA and LowestBar(Low,10)=0
Then Buy next bar at High + 1 Point Stop;
If Close < MA and HighestBar(High,10)=0
Then SellShort next bar at Low - 1 Point Stop;
```

Double Moving Average Short Strategy Code:

```
inputs: Price( Close ), FastLength( 9 ), SlowLength( 18 ) ;
variables: FastAvg( 0 ), SlowAvg( 0 ) ;

FastAvg = AverageFC( Price, FastLength ) ;
SlowAvg = AverageFC( Price, SlowLength ) ;

if CurrentBar > 1 and FastAvg crosses under SlowAvg then
Sell Short ( "MA2CrossSE" ) next bar at market ;
```

Double Moving Average Long Strategy Code:

```
inputs: Price( Close ), FastLength( 9 ), SlowLength( 18 ) ;
variables: FastAvg( 0 ), SlowAvg( 0 ) ;

FastAvg = AverageFC( Price, FastLength ) ;
SlowAvg = AverageFC( Price, SlowLength ) ;

if CurrentBar > 1 and FastAvg crosses over SlowAvg then
Buy ( "MA2CrossLE" ) next bar at market ;
```

13.4 Matthew Puksta's Trades

Company	Date in	Date Out	Price in	Price out/currently	Shares	Profit per share	Profit	Base Investment	Grossed	% gain per stock
Olin Corporation	1/27/2016	1/29/2016	14.5	16.31	100	1.81	181	1450	1631	12.48275862
Sturm Ruger	1/14/2016	3/22/2016	51.4	76.45	115	25.05	2880.75	5911	8791.75	48.73540856
Irobot	2/5/2016	N/O	33.65	37.16	50	3.51	175.5	1682.5	1858	10.43090639
BAE	2/12/2016	3/7/2016	467.1	500	120	32.9	3948	56052	60000	7.043459645
LUX	2/17/2016	3/7/2016	57.4	53.15	100	-4.25	-425	5740	5315	-7.404181185
Gold1	1/18/2016	3/14/2016	1091.5	1243.28	30	151.78	4553.4	32745	37298.4	13.90563445
Chipotle	3/7/2016	3/16/2016	529.71	500.9	75	-28.81	-2160.75	39728.25	37567.5	-5.438825017
Exxon Mobil	3/7/2016	N/O	82.34	88.44	75	6.1	457.5	6175.5	6633	7.40830702
Gold2	3/7/2016	3/10/2016	1267.21	1281.4	30	14.19	425.7	38016.3	38442	1.11978283
Caterpillar	3/7/2016	N/O	74.92	73.69	60	-1.23	-73.8	4495.2	4421.4	-1.641751201
US Steel	3/7/2016	N/O	13.36	19.06	225	5.7	1282.5	3006	4288.5	42.66467066
Verizon	3/9/2016	N/O	52.19	50.74	70	-1.45	-101.5	3653.3	3551.8	-2.778310021
Disney	3/9/2016	N/O	97.6	104.41	70	6.81	476.7	6832	7308.7	6.977459016
TWX	3/9/2016	N/O	68.57	75.77	70	7.2	504	4799.9	5303.9	10.50021875
Chipotle 2	3/9/2016	3/16/2016	505.32	500.9	75	-4.42	-331.5	37899	37567.5	-0.874693264
Netflix	3/10/2016	3/11/2016	96.2	96.5	70	0.3	21	6734	6755	0.311850312
Netflix 2	3/14/2016	4/14/2016	98.07	111.56	100	13.49	1349	9807	11156	13.75548078
Sturm Ruger 2	3/14/2016	3/22/2016	76.02	76.45	60	0.43	25.8	4561.2	4587	0.565640621
Smith and Wesson	3/18/2016	5/5/20016	29.29	22.75	160	-6.54	-1046.4	4686.4	3640	-22.32843974
Northrop Grumman	3/18/2016	N/O	193.76	211.11	120	17.35	2082	23251.2	25333.2	8.954376548
Texas Instruments	3/18/2016	N/O	56.84	56.85	176	0.01	1.76	10003.84	10005.6	0.017593244
Silver and Wheaton	3/18/2016	N/O	17.84	18.76	130	0.92	119.6	2319.2	2438.8	5.156950673
Allied Minds	3/21/2016	3/31/2016	424.5	473.4	60	48.9	2934	25470	28404	11.51943463
Iron Mountain	3/28/2016		33.32	37.07	1000	3.75	3750	33320	37070	11.2545018

	C Term Net investment	C Term Net profit		Return %
	103580.5	11313.65		10.92256747
	D Term Net Investment	D Term Net Profit		Return %
	264758.29	9715.61		3.669615029
Total Investment	Total Gross	Total Net Profit		Gross Return %
368338.79	389368.05	21029.26		5.709216778
Current Investment in market	Total Profit	Profit on current investment		
110136.04	21029.26	19.09389515		

14 APPENDIX B: JOURNALS

14.1 ABRIN BERKEMEYER'S JOURNAL ENTRIES

Journal Entry 1 ~ Jan 25-Feb 1

Monday:

I started out this week working on a support and resistance strategy that took into account previous highs and lows to create bounded channels; the upper bound is the resistance and the lower bound is the support. When the currency pair crossed the resistance from above moving downwards the program would go short and when the currency pair crossed the support from below moving upwards the program would go long.

I back tested the program on several different intervals on several different currency pairs. The program was profitable on most of the currency pairs I back tested it on and I found that it worked best on medium time-length intervals (5-30 minute bars). Once I was satisfied with the back testing results, I decided to see how the program would do live traded.

This is where I found an issue with my program. During the time period I live traded the market began to reverse position from a downward trend to an upward trend. The program had gone short as in the downward trend the price tended to cross the resistance from above then go to the support and sell. Typically what would happen after that is the support and resistance channel would shift downwards based off of previous prices and the price would cross the resistance from above again; taking another short trade. When the market reversed I was in a short trade and the channels began to shift upward with the market. As a result, the price stayed around the resistance line and never crossed the support so it never sold. As the price moved upward, the support and resistance moved up with it leading to more and more losses as the price never crossed the support.

This cycle continued for most of the week as I decided to let the program do its own thing and stick to the system.

Thursday:

By Thursday I was fed up and learned something about myself. I was not a fan of two aspects of the program trading:

1. I did not like how long I had to wait for the program to work itself out of the losses it was generating, and
2. I did not like leaving the decision to trade up to the computer.

There were times I thought I should leave my position before the program triggered a sell but I was following the rules I put on myself when I wrote the code.

I terminated my position Thursday when the losses did not appear to be turning around.

As a result of this experience I have decided to manual trade and set up personal, strategic rules for myself as I manual trade.

Starting Manual Trading:

Thursday:

My first goal for manual trading is to make around 100 dollars a day.

➔ Optimally, that's roughly 500 dollars a week
➔ 26,000 dollars a year which is 26% a year on 100,000

More realistically, I expect to make half of that.

➔ 250 dollars a week to adjust for losers and varying lengths of positions
➔ 13,000 dollar a year which is 13% annual return on 100,000

I decided to trade on only one standard lot as of now even though I have to capital to trade more than that due to margin. Trading on only one standard lot requires less initial capital which bears more relevance on my life personally as I will not have a lot of capital to trade in the near future anyway.

Because of my class schedule my optimum time to manually trade is between 11-5 on Monday, Wednesday, and Thursday. After some research these times became especially interesting as the EURUSD peak trading hours are between 11 and 2 each day.

I decided to trade depending on which direction the market was trading. My first manual trade was on Thursday the 28th of January. I looked at the daily, 60 minute, 20 minute, 5 minute, and 1 minute bars to see what the direction the currency pair was moving in (mostly the longer interval charts).

I noticed the EURUSD was in an upward trend so at 11:45 I entered the market long. An hour and a half later the EURUSD had dropped roughly 10 pips from where I had entered but I held onto my trade expected a reverse as the market was trending upward. By 1:45 the price had indeed continued to go up and I sold for a 117 dollar profit.

At that point I stayed out of the market for the day after having met my desired quota.

Friday:

Friday was a very interesting day for USD paired currency pairs. The US announced a drop in GDP growth. GDP growth slowed from 2% growth to 0.7% GDP growth. As a result, the EURUSD dropped roughly 100 pips.

I was asleep during the announcement and most of the drop happened while I was asleep. By the time I saw the charts the drop in price resulting from the announcement had already happened. Due to the drastic degree of the drop I decided to take advantage of the reversal up swing. After the drop, the price leveled off making some upward movements and I entered long in the market on Friday around noon. I waited all Friday for the price to make its move upward but it was moving steadily up and down all day with no clear direction in movement. By the end of the day I was down about 40 dollars and decided to hold onto the position over the weekend in expectation that the price was still going to move upwards. Then, looking at the graph Sunday, the price had indeed moved up and I sold when I profited about 86 dollars around 8:30PM.

As of this week my trades are as follows:

	All Trades	Long Trades	Short Trades
Total Net Profit	$203.40	$203.40	$0.00
Gross Profit	$203.40	$203.40	$0.00
Gross Loss	$0.00	$0.00	$0.00
Profit Factor	n/a	n/a	n/a
Roll Over Credit	($2.60)	($2.60)	$0.00
Open Position P/L	$0.00	$0.00	$0.00
Select Total Net Profit	$203.40	$203.40	$0.00
Select Gross Profit	$203.40	$203.40	$0.00
Select Gross Loss	$0.00	$0.00	$0.00
Select Profit Factor	n/a	n/a	n/a
Adjusted Total Net Profit	$59.57	$59.57	$0.00
Adjusted Gross Profit	$59.57	$59.57	$0.00
Adjusted Gross Loss	$0.00	$0.00	$0.00
Adjusted Profit Factor	n/a	n/a	n/a
Total Number of Trades	2	2	0
Percent Profitable	100.00%	100.00%	0.00%
Winning Trades	2	2	0
Losing Trades	0	0	0
Even Trades	0	0	0
Avg. Trade Net Profit	$101.70	$101.70	$0.00
Avg. Winning Trade	$101.70	$101.70	$0.00
Avg. Losing Trade	$0.00	$0.00	$0.00
Ratio Avg. Win:Avg. Loss	n/a	n/a	n/a
Largest Winning Trade	$117.00	$117.00	$0.00
Largest Losing Trade	$0.00	$0.00	$0.00
Largest Winner as % of Gross Profit	57.52%	57.52%	n/a
Largest Loser as % of Gross Loss	n/a	n/a	n/a
Max. Consecutive Winning Trades	2	2	0
Max. Consecutive Losing Trades	0	0	0
Max. Shares/Contracts Held	100000	100000	0
Total Shares/Contracts Held	200000	200000	0

I only traded half the week and almost made my quota of 250 dollars so I'm pretty happy with this return.

Journal Entry 2 ~ Feb 2-Feb 8

Trading this week started out very rough when I diverged from and changed my manual trading strategy.

Tuesday:

After analyzing the EURUSD charts at different time intervals to get a sense of market direction. The charts showed the EURUSD moving in an upward trend over the longer length bar charts. There was considerable variance in the market as the price oscillated upwards. I bought in after a significant price drop/period of multiple red bars. Seeing as the market was trending upwards I was very happy about this decision.

I began to watch the faster moving charts: one minute, two minute, and five minute bar charts to watch my investment.

➔ This was mistake #1.

Watching my investment I began to get anxious as the charts continued going down on the shorter interval bars. There were times I wanted to get out of the market and just take a small loss but I decided to hold to my strategy and wait for the turn around and the charts to continue with the upward trend they had been moving in.

➔ This was a good decision.

I kept hovering over my trade and the bars kept going down. After a few hours I really began to question my investment as the losses became greater and greater. I eventually let my nerves get the best of me and had convinced myself that the market was not upward trending anymore, but had changed direction. So, in kind, I reversed my position.

➔ This was mistake #2, and it was the big one.

Upon reversing my position, I took a loss on my initial long trade. The market moved a little further downward and I convinced myself I was right this time so I doubled down to hopefully make up from my previous losses.

➔ This was mistake #3.

Shortly after the market began to go back up, as I had originally told myself it was going to. Too bad I had already convinced myself to change my mind. This time, I told myself I was going to really stick to my guns and not let swings in the market sway my confidence. Unfortunately, I was already dead wrong and I should have had faith in my original strategy and not sold out when the price continued to drop after my initial investment. As a result, I took heavy losses that day.

➔ I lost 2,200; a rather large set back as my strategy thrives off of small profits.

The Rest of the Week:

On the upside I learned a lot from these mistakes and have made some helpful changes to my strategy.

➔ I did not have a losing trade for the rest of the week.

Since that Tuesday, I have decided to trade more than just one standard lot at a time. In such a way, I see the smaller markets swings reflected much more in my current position values. Micro-pips now hold larger value as a whole and I don't have to be in the market as long to see the same amount of profits as if I was only trading one standard lot. In such a way, I can use my fascination with hovering over my investment to my advantage to get out of the market earlier than I may have originally expected with a decent amount of profit.

Adding this week, my trade history is now as follows:

	All Trades	**Long Trades**	**Short Trades**
Total Net Profit	($1,553.10)	($147.60)	($1,405.50)
Gross Profit	$1,074.90	$383.40	$691.50
Gross Loss	($2,628.00)	($531.00)	($2,097.00)
Profit Factor	0.41	0.72	0.33
Total Number of Trades	17	6	11
Percent Profitable	58.82%	66.67%	54.55%
Winning Trades	10	4	6
Losing Trades	7	2	5
Even Trades	0	0	0
Avg. Trade Net Profit	($91.36)	($24.60)	($127.77)
Avg. Winning Trade	$107.49	$95.85	$115.25
Avg. Losing Trade	($375.43)	($265.50)	($419.40)
Ratio Avg. Win:Avg. Loss	0.29	0.36	0.27
Largest Winning Trade	$210.00	$125.00	$210.00
Largest Losing Trade	($1,130.00)	($396.00)	($1,130.00)
Max. Consecutive Winning Trades	5	2	4
Max. Consecutive Losing Trades	4	2	2
Max. Shares/Contracts Held	500000	500000	500000
Total Shares/Contracts Held	5550000	1400000	4150000
Account Size Required	$2,274.00	$531.00	$1,868.00

In the news this week:

The United States released a job reports showed a drop in unemployment to 4.9%. Employment rose by 151,000 in January. This job report had a more positive result than negative even though it bears some ambiguity. Although jobs were positive, the job rate slowed and wages picked up. The Fed has to decide whether or not the report was strong enough to increase interest rates again. The amount of new jobs was well off of last year's average of 228,000 jobs per month. As a result of the report, the dollar was seen to be as getting stronger and as a result there was a significant drop in the EURUSD Friday at 8:30. Such a drop can be expected as the dollar strengthens as it is in the denominator of the EURUSD ticker. The news also countered the market direction at the time as EURUSD had been trending upwards.

China's foreign currency reserve fell 100 billion the past two months. In August China's central bank devalued the yuan and investors panicked and sold so they've been using their foreign currency stockpile to stabilize it. Question comes into play of the bank's ability to keep intervening. This has created a vicious cycle as the bank's ability to stabilize the currency is always in question people keep selling out of fear.

Journal Entry 3 ~ Feb 9-Feb 15

This week has been a rather successful week. I made four trades all week; all winners with a net profit of 528.50 dollars.

My first trade started Tuesday the 9th at 1-PM. Looking at the daily charts, the EURUSD had been moving upwards substantially. The 20/30 minutes bars were obviously also moving upwardly but less smoothly. After several large gains the EURUSD would make small drops in price before going back up. Upon analyzing the market I noticed we were in another small drop period. I took a long position at this point with the market moving upward in the daily bars I wasn't concerned with holding onto the position if the EURUSD continued to go down from where I entered instead of continuing its steep increases.

The EURUSD did continue to go down steadily and I held onto my position. There was one point where I was down 28 pips; which trading five standard lots equates to 1,400 dollars in losses. I stuck to my guns and did not sell.

Sure enough, the price did turn around. On Thursday the 11th I got out of the market with 196.50 dollars in profit.

At this time, after substantial upward movement, the market was very volatile and moving sideways. I took advantage of this by shorting as the new daily bar was red.

I got back into the market later that night at 4-PM when the Australian market opened. The new daily bar was red so I was looking to short the market on the short term with the back-up that if the market jumped up in the short term that it would continue to go down in the longer run. I was in the market from 4:15 to 5-PM and made 80 dollars profit. This concluded my trading for the day.

Overnight the market continued to go down. After a small upswing I decided to short the market as it was the second day in a row with a red bar. The market continued to move upwards slowly until the market reopened on Sunday the 14th. The market then began to drop again and I got out with a 252 dollar profit.

This week's results:

	All Trades	**Long Trades**	**Short Trades**
Total Net Profit	$528.50	$196.50	$332.00
Gross Profit	$528.50	$196.50	$332.00
Gross Loss	$0.00	$0.00	$0.00
Profit Factor	n/a	n/a	n/a

Roll Over Credit	($56.50)	($68.50)	$12.00
Open Position P/L	$0.00	$0.00	$0.00
Select Total Net Profit	$528.50	$196.50	$332.00
Select Gross Profit	$528.50	$196.50	$332.00
Select Gross Loss	$0.00	$0.00	$0.00
Select Profit Factor	n/a	n/a	n/a
Adjusted Total Net Profit	$264.25	$0.00	$140.32
Adjusted Gross Profit	$264.25	$0.00	$140.32
Adjusted Gross Loss	$0.00	$0.00	$0.00
Adjusted Profit Factor	n/a	n/a	n/a
Total Number of Trades	4	1	3
Percent Profitable	100.00%	100.00%	100.00%
Winning Trades	4	1	3
Losing Trades	0	0	0
Even Trades	0	0	0
Avg. Trade Net Profit	$132.12	$196.50	$110.67
Avg. Winning Trade	$132.12	$196.50	$110.67
Avg. Losing Trade	$0.00	$0.00	$0.00
Ratio Avg. Win:Avg. Loss	n/a	n/a	n/a
Largest Winning Trade	$252.00	$196.50	$252.00
Largest Losing Trade	$0.00	$0.00	$0.00
Largest Winner as % of Gross Profit	47.68%	100.00%	75.90%
Largest Loser as % of Gross Loss	n/a	n/a	n/a
Max. Consecutive Winning Trades	4	1	3
Max. Consecutive Losing Trades	0	0	0
Max. Shares/Contracts Held	500000	500000	500000
Total Shares/Contracts Held	2000000	500000	1500000
Account Size Required	$0.00	$0.00	$0.00
Return on Initial Capital	0.53%		
Annual Rate of Return	36.10%		
Buy & Hold Return	(0.57%)		
Return on Account	n/a		
Avg. Monthly Return	$528.50		

In the news:

ECB President Mario Draghi spoke this morning about the European economy. He announced that the bank wouldn't hesitate to boost stimulus in March if the financial market turmoil and lower oil prices could weigh further on low inflation. The ECB is facing credibility

issues with its ability to move inflation in the direction it wants and the ability to keep European banks stable.

The WSJ journal article also brought up the ECB's disappointing stimulus expansion back in December which rose the euro higher against the dollar.

Inflation in the Eurozone is expected to fall below zero over the next few months. The ECB's target is just below 2% so this would be moving in the wrong direction in the next few months if speculations are correct.

Furthermore:

This week Kieran and I gave a presentation to the Investment Association on campus about the Forex. We covered all aspects: the major currencies, currency pairing, price changes, pips, exchange opens, commissions (or lack thereof), etc.

Journal Entry 4 ~ Feb 16-Feb 22

This week was a much slower week for me; I did not trade as much as I have been in the past few weeks.

➔ I made 3 trades this week for a gain of 340 dollars; a little over my 250 dollar quota.

My first trade was made on the 18th. The EURUSD daily bar on the 18th continued to be red, like the four daily bars before it. Following the downward trend, I looked at the two and five minute bars to find an appropriate time to short (preferably after a small upward gain with market expectation going downward). From 10:30AM to 11AM the EURUSD had a steady increase in price. After a few red bars, when it was apparent the price was dropping once again, I entered the market short. Within eight minutes I had made 135 dollars and I exited with the profit.

I stayed out of the market until the 22nd as the daily bar on the 19th was green and the market direction wasn't clear in the upcoming days.

Not trading the 19th, or during the weekend, I didn't enter the market again until the 22nd.

On the 22nd, the daily bar showed a steep decline in price as the EURUSD was down 100 pips. With a clear sense that the market was dropping for the day I was very comfortable making a short trade. After missing the large drop in the morning I entered the market after a short period of increasing prices. I watched my investment on the two minute bars to get a sense of market direction on the short term. Within 10 minutes, after steady declines, I was up 100 dollars and I exited the market with the profit.

Continuing to watch the two minute bars I watched the bars oscillate downwardly. I entered the market again after a fairly steep increase in price over a 10 minute period and entered the market short again. Within 5 minutes I was up 105 dollars and I exited the market with the profit.

Watching the chart after exiting the market on the 22nd, both trades showed clear opportunities to profit more on each trade.

➔ The unpredictability of the market makes me more risk averse.
➔ Due to this, I exit the market after I achieve my small, desired profits.
➔ The potential for more profits makes me weary with letting greed take over my strategy but also brings my exit criteria into question.
➔ Looking forward I want to look into implementing a different exit strategy that to increase profits but not increase my risk too largely.

Furthermore:

I also learned this week that my strategy requires a lot of attention to be effective. Also on the 22nd, the day I made the most of my trades, I missed a giant price swing with a 20 pip increase followed by a 21 pip decrease. The EURUSD shot straight up for 15 minutes straight on the two minute charts and then immediately declined just as steeply for the next 15 minutes. No doubt, under my strategy I would have gone short on the increase and profited from the decrease.

➔ From this I learned that to be as productive with my trading/strategy implementation I will need to have the time to watch the market thoroughly.
➔ Also, my strategy is definitely for the short-term investor.

This week's trade results:

	All Trades	**Long Trades**	**Short Trades**
Total Net Profit	$340.00	$0.00	$340.00
Gross Profit	$340.00	$0.00	$340.00
Gross Loss	$0.00	$0.00	$0.00
Profit Factor	n/a	n/a	n/a
Roll Over Credit	$0.00	$0.00	$0.00
Open Position P/L	$0.00	$0.00	$0.00
Select Total Net Profit	$340.00	$0.00	$340.00
Select Gross Profit	$340.00	$0.00	$340.00
Select Gross Loss	$0.00	$0.00	$0.00
Select Profit Factor	n/a	n/a	n/a
Adjusted Total Net Profit	$143.70	$0.00	$143.70
Adjusted Gross Profit	$143.70	$0.00	$143.70
Adjusted Gross Loss	$0.00	$0.00	$0.00
Adjusted Profit Factor	n/a	n/a	n/a
Total Number of Trades	3	0	3
Percent Profitable	100.00%	0.00%	100.00%
Winning Trades	3	0	3
Losing Trades	0	0	0
Even Trades	0	0	0
Avg. Trade Net Profit	$113.33	$0.00	$113.33

Avg. Winning Trade	$113.33	$0.00	$113.33
Avg. Losing Trade	$0.00	$0.00	$0.00
Ratio Avg. Win:Avg. Loss	n/a	n/a	n/a
Largest Winning Trade	$135.00	$0.00	$135.00
Largest Losing Trade	$0.00	$0.00	$0.00
Largest Winner as % of Gross Profit	39.71%	n/a	39.71%
Largest Loser as % of Gross Loss	n/a	n/a	n/a
Max. Consecutive Winning Trades	3	0	3
Max. Consecutive Losing Trades	0	0	0
Max. Shares/Contracts Held	500000	0	500000
Total Shares/Contracts Held	1500000	0	1500000
Account Size Required	$0.00	$0.00	$0.00
Return on Initial Capital	0.34%		
Annual Rate of Return	29.25%		
Trading Period	4 Dys, 5 Hrs, 43 Mins		
Percent of Time in the Market	0.35%		
Time in the Market	21 Mins		
Longest Flat Period	3 Dys, 23 Hrs, 50 Mins		

In the news:

The USD gained strength from the 2016 Economic Report of the President. The report outlined contemporary consumer confidence and job growth amongst the US's substantial economic progress. The report also highlighted the low unemployment and an increase in domestic demand; both adding strength to the dollar. In a world of slowing growth rates, the US had one of the highest growth rates in 2015 according to the IMF. Overall, the report strengthened the dollar and drastically dropped the EURUSD for the day.

Another article outlined five trends that could play a significant part in the shaping of the US's future economy; relevantly effecting the strength the dollar and the future direction of the EURUSD. The article was based off of the 2016 Economic Report of the President (tying in to what is written above). One should look at:

1. US growth compared to global growth
2. Unequal division of land and labor
3. Increase in housing costs
4. Unfunded pension liabilities
5. Low productivity and how it is countered by innovation and technology

Journal Entry 5 ~ Feb 23-Feb 29

I had another successful week this week, which I'm pretty excited about and a little worried. I haven't made a losing trade in the past four weeks, which is awesome no doubt, but my fear comes from worrying about my winning percentage.

➔ I <u>do not</u> want to let my winning percentage take over my trading strategy.

➔ It is currently not an issue and on the short term I am not too worried about it as I haven't let it affect my trades as far as I can tell, I just don't want it to affect future trades.

On Tuesday the US Existing Home Sales and Consumer Confidence reports came out and weakened had mixed effects on the EURUSD; overall resulting in yet another daily decrease in the EURUSD. The Existing Home Sales were 0.15M better than expected and Consumer Confidence was down 4.8% from what was expected having a counteracting affect with each other. As the daily bars were trending downwards I wanted to go short on the EURUSD. There was a large drop in the EURUSD at 4AM an hour after the England market opened. Afterward the market was trading sideways until it made a move up at 11AM and then began to decline again. Overall, I thought the US reports along with the daily downward trend were going to force the price back down.

I entered the market around 12:15PM after a short period of dropping prices which isn't my ideal entry point. The market then, on the very short term (an hour), increased and then dropped during the next hour and I sold at 2:30PM.

➔ I profited 195 dollars; almost my weekly goal of at least 250.

I stayed out of the market for the next two days where there was a lot of volatility and no clear direction whether the daily bar would end with higher or lower close.

On Friday I got into the market short from 12:45PM to 1PM. Friday was the release date of the US Gross Domestic Product Price Index and US Gross Domestic Product Annualized. Both reports were good and strengthened the dollar resulting in a drop in the EURUSD. The EURUSD dropped from 8:45AM to 1:15PM.

➔ I profited 100 dollars on this trade.

After the weekend I got back into the market on Monday. On Monday the European Monetary Union released the Consumer Price Index report which was -0.2%; worse than the expected 0.0%. As a result, the EUR weakened and the EURUSD dropped yet again. There was a steady decline in price from 10AM to 10:45AM followed by a small 15min increase. The increase was counteracted by a very steep 3min decline which was followed by a very steep 3min increase. I decided to enter the market short at the top of this increase.

➔ Within five minutes I was up 130 dollars and I exited the market with my profit.
➔ For the week I profited 425 dollars: well above the 250 dollar quota.

In the news:

This week I incorporated the news I followed in my decision making process steps above.

This week's results:

	All Trades	Long Trades	Short Trades
<u>Total Net Profit</u>	$425.00	$0.00	$425.00

Gross Profit	$425.00	$0.00	$425.00
Gross Loss	$0.00	$0.00	$0.00
Profit Factor	n/a	n/a	n/a
Select Total Net Profit	$425.00	$0.00	$425.00
Select Gross Profit	$425.00	$0.00	$425.00
Select Gross Loss	$0.00	$0.00	$0.00
Adjusted Total Net Profit	$179.63	$0.00	$179.63
Adjusted Gross Profit	$179.63	$0.00	$179.63
Adjusted Gross Loss	$0.00	$0.00	$0.00
Adjusted Profit Factor	n/a	n/a	n/a
Total Number of Trades	3	0	3
Percent Profitable	100.00%	0.00%	100.00%
Winning Trades	3	0	3
Losing Trades	0	0	0
Even Trades	0	0	0
Avg. Trade Net Profit	$141.67	$0.00	$141.67
Avg. Winning Trade	$141.67	$0.00	$141.67
Avg. Losing Trade	$0.00	$0.00	$0.00
Ratio Avg. Win:Avg. Loss	n/a	n/a	n/a
Largest Winning Trade	$195.00	$0.00	$195.00
Largest Losing Trade	$0.00	$0.00	$0.00
Largest Winner as % of Gross Profit	45.88%	n/a	45.88%
Largest Loser as % of Gross Loss	n/a	n/a	n/a
Max. Consecutive Winning Trades	3	0	3
Max. Consecutive Losing Trades	0	0	0
Max. Shares/Contracts Held	500000	0	500000
Total Shares/Contracts Held	1500000	0	1500000
Account Size Required	$0.00	$0.00	$0.00
Return on Initial Capital	0.42%		
Annual Rate of Return	24.96%		
Buy & Hold Return	(1.23%)		
Avg. Monthly Return	$425.00		
Trading Period	6 Dys, 4 Hrs, 56 Mins		
Percent of Time in the Market	1.69%		
Time in the Market	2 Hrs, 31 Mins		
Longest Flat Period	2 Dys, 22 Hrs, 19 Mins		

14.2 Jacob Billington's Journal Entries

Journal 2/5/2016

One of the main issues with S/R strategies is sudden change that isn't due to natural fluctuations of the market. Today the employment situation was released at 0830 and almost instantly after the EURUSD dropped and I was in the wrong position.

On another note the USDCAD rose steadily today due to Canada's international trade report and their employment situation.

Journal 2/8/2016

S/R strategies do not work any time there is major news. As such I will be dropping any position before Thursday this week as Thursday has the jobless claims which I expect will drive up the USD in all markets and the retail sales on Friday which I don't know what will do

General consensus for the week: stop only auto trading and start using my system as an indicator and watch the news to know when a trade is good or not.

Journal from 2/10/2016 to 2/16/2016

Forex:

This is the first week that I decided to begin manual trading. My Stochastic and RSI strategy worked really well on automation except for periods of trending markets. Almost every loss I had in the automated system I could pinpoint a reason why based on the news or an obvious trend. To counter this I have turned my automated system into an indicator. This worked beautifully at first and I was able to make 20% within the first couple of days. Soon after I broke a very serious rule that cost me almost 5%. I left my computer with a trade open. When I checked again I had missed my exit point and went from being up several hundred dollars to being down several hundred dollars. After this point I decided that my strategy was not at fault I just needed to not break any of the rules. I decided then to reset my account to exactly $10,000 and trade it from Tuesday 2/16 to see how well I can do with this set amount of money. Currently I am having trouble finding the correct zone to trade again and have suffered some small losses but I am getting back into the swing of things and expect to have noticeable profits by next week.

In the news last week was the jobless report that I predicted would be under estimated and I was correct as it was almost twice as high as the consensus predicted. I was unsure of this and did not enter the market off of it however I should have shorted the USD as it dropped quite a bit after that report.

Stock:

My idea of investing in Chipotle is starting to pay off. Two weeks ago I predicted that chipotle was in for a large turn around as the FDA had just cleared them and they were still planning to open an addition 250 stores this year, not to mention chipotle's cult like following. With all that I

assumed that the stock was way underpriced so I invested. I was about a week too early and almost immediately lost 10%. However, I assumed that the logic was correct but I was just too early and this week seems to be proving me right as I am up almost 10% now.

14.3 KIERAN COCHRANE'S JOURNAL ENTRIES

Journal 2/1/16

I used a trend following strategy based on a moving average for the EURUSD. News of the GDP drop of 0.7% lowered the value of the dollar. I lost money during those trades.

Japanese banks declared negative interest rates, skyrocketing for a short time period last week. Manually entered long trade, closed with +$1,300.

Journal 2/8/16

I tried a Moving Average Double Crossover Strategy (MADC) with a percent trailing stop as an exit strategy. It worked well with sideways markets, but lost big when important news like the jobless claims report came out which was released on the 4th.

I am currently working on an RSI strategy on the EURCAD which is seeing weekly profits of about 2%, but it has more losing shorts when the market has its surprise ups and downs. I am going to focus on creating a percent profit trailing stop strategy that will prevent a bigger loss on these shorts while still giving me a profit. I will also be keeping an eye on the news and sources like the Bloomberg Economic Calendar to stay ahead and possibly get out of the market during days with which market moving news is released.

Journal 2/8/16 – 2/16/16

Over the course of the past week I have been transitioning from auto-trading based on RSI as well as Bollinger Bands for both long and short entries. I also implemented a percent trailing stop to limit my losses. The problem I encountered with this is that it also limited some potential profits because the strategy is designed to exit after a certain percentage of the initial investment was either made or lost. I optimized it through trade station and it determined that 11% was the ideal percentage.

Also over the course over the past week I have been trading during times where reports that move the market are released. Last week these reports included the jobless claims, ECB President Draghi's speech, as well as GDP releases for the US. I would log onto TradeStation during the time of these releases and based on the general direction of the 5-minute bars during the release I would go short or long. I would stay in the market for a brief period (30 minutes) because by the end of that time, the EURUSD had recovered to its original level.

I learned that trying to predict a report or speech is not a good idea as I did research on the release of one report and shorted about 10 minutes prior to the report. The report strengthened the EURUSD and I ended up losing about $120 during that trade. The positive from this experience is

that for the remainder of the week I refrained from trading before the report and only traded during the release, which allowed me to make a total net profit of $319.50.

Another account for my gross loss of $286.61 was due to the fact that I didn't turn off my auto-trading strategy for the EURCHF which by itself caused another loss of about $120. Thanks to this loss I know double check all charts to make sure there are no strategies auto trading when I leave the computer.

In the upcoming week I will be adjusting my RSI and Bollinger Band strategies to work more as indicators for me so that I can use them in tandem with the news reports released this week to trade and hopefully make a profit of over $250.

Below is the analysis of my trades over the past week:

	All Trades	**Long Trades**	**Short Trades**
Total Net Profit	$319.50	$47.83	$271.67
Gross Profit	$606.11	$123.11	$483.00
Gross Loss	($286.61)	($75.28)	($211.33)
Profit Factor	2.11	1.64	2.29
Roll Over Credit	$0.00	$0.00	$0.00
Open Position P/L	$0.00	$0.00	$0.00
Select Total Net Profit	$319.50	$47.83	$271.67
Select Gross Profit	$606.11	$123.11	$483.00
Select Gross Loss	($286.61)	($75.28)	($211.33)
Select Profit Factor	2.11	1.64	2.29
Adjusted Total Net Profit	($0.23)	($57.19)	($87.07)
Adjusted Gross Profit	$377.02	$61.56	$204.14
Adjusted Gross Loss	($377.25)	($118.74)	($291.21)
Adjusted Profit Factor	1.00	0.52	0.70
Total Number of Trades	17	7	10
Percent Profitable	41.18%	57.14%	30.00%
Winning Trades	7	4	3
Losing Trades	10	3	7
Even Trades	0	0	0
Avg. Trade Net Profit	$18.79	$6.83	$27.17
Avg. Winning Trade	$86.59	$30.78	$161.00
Avg. Losing Trade	($28.66)	($25.09)	($30.19)
Ratio Avg. Win:Avg. Loss	3.02	1.23	5.33
Largest Winning Trade	$222.00	$65.00	$222.00
Largest Losing Trade	($109.00)	($30.85)	($109.00)
Largest Winner as % of Gross Profit	36.63%	52.80%	45.96%
Largest Loser as % of Gross Loss	38.03%	40.97%	51.58%

Net Profit as % of Largest Loss	293.12%	155.06%	249.23%
Select Net Profit as % of Largest Loss	293.12%	155.06%	249.23%
Adjusted Net Profit as % of Largest Loss	-0.21%	-185.40%	-79.88%
Max. Consecutive Winning Trades	4	4	1
Max. Consecutive Losing Trades	4	2	5
Max. Shares/Contracts Held	n/a	n/a	n/a
Total Shares/Contracts Held	2,700,000	1,300,000	1,400,000

Journal 2/16/2016 – 2/29/2016

During the past two weeks I have been attempting to trade based on reports released over the course of each week. These reports include those such as the Jobless claims report, GDP reports, speeches by FOMC members, as well as Existing Homes Sales and New Homes Sales. I have found that following the release of "Big Impact" reports the currency pair undergoes a large movement in a very short amount of time. Below are the report types that I consider to have the largest impact on the currency pair compared to other reports.

"Big Impact" report types:

- Central Banks
  - Speeches
    - President Draghi 2/15
  - Meeting Minutes
    - Federal Open Market Committee (FOMC)
- Employment
  - Jobless Claims
  - Philly Fed Employment
- Economic Activity
  - Building Permits
  - Philadelphia Fed Manufacturing Index
  - New Home Sales

For the week of the 16th I stayed mostly out of the market as I wanted to see how the reports released throughout the course of the week would have the desired effect. As I believed, the reports did indeed impact the currency pairs (Mainly focused on EURUSD) and I was able to figure out which reports had a larger impact and which ones I didn't need to research or worry about what direction they could push the pair. I noticed that reports such as the annual GDP an unemployment rates can swing the pair up or down by 10s of pips in less than 15 minutes. Below are some images of the EURUSD during the release of an initial jobless claim, President Draghi's speech, and a building Permits report:

(1) President Draghi's speech on the 17th

(2) Initial Jobless claim on the 18th

(3) Building Permits report on the 17th

(1)   (2)   (3)

For the week of the 22ⁿᵈ I decided to switch from just watching during the release of a report to trade. I learned quickly not to try and predict the outcome of a report as I attempted to do this with a jobless claims and the exact opposite of my prediction occurred and I lost $245. Following this mistake and the mistake of leaving a position unattended over the weekend I had a string of small successful trades based entirely of on trading during the hour window of the report where I usually only stayed in the market for under 20 minutes. I would wait about 2 or 3 minutes after the report released before trading so I could if the rise or drop would continue or suddenly swing. For the upcoming weeks I plan on continuing this strategy of trading during the report release as well as staying out of the market during the weekend as that happens to be the biggest reason for my losses.

TradeStation Performance Summary:

	All Trades	**Long Trades**	**Short Trades**
Total Net Profit	($1,964.60)	($2,006.60)	$42.00
Gross Profit	$405.00	$363.00	$42.00
Gross Loss	($2,369.60)	($2,369.60)	$0.00
Profit Factor	0.17	0.15	n/a
Roll Over Credit	($5.60)	($5.60)	$0.00
Open Position P/L	$0.00	$0.00	$0.00
Select Total Net Profit	($1,964.60)	($2,006.60)	$42.00
Select Gross Profit	$405.00	$363.00	$42.00
Select Gross Loss	($2,369.60)	($2,369.60)	$0.00
Select Profit Factor	0.17	0.15	n/a
Adjusted Total Net Profit	($3,821.28)	($3,863.66)	$0.00
Adjusted Gross Profit	$223.88	$181.50	$0.00
Adjusted Gross Loss	($4,045.16)	($4,045.16)	$0.00
Adjusted Profit Factor	0.06	0.04	n/a

Total Number of Trades	7	6	1
Percent Profitable	71.43%	66.67%	100.00%
Winning Trades	5	4	1
Losing Trades	2	2	0
Even Trades	0	0	0
Avg. Trade Net Profit	($280.66)	($334.43)	$42.00
Avg. Winning Trade	$81.00	$90.75	$42.00
Avg. Losing Trade	($1,184.80)	($1,184.80)	$0.00
Ratio Avg. Win:Avg. Loss	0.07	0.08	n/a
Largest Winning Trade	$144.00	$144.00	$42.00
Largest Losing Trade	($2,317.60)	($2,317.60)	$0.00
Largest Winner as % of Gross Profit	35.56%	39.67%	100.00%
Largest Loser as % of Gross Loss	97.81%	97.81%	n/a
Net Profit as % of Largest Loss	-84.77%	-86.58%	n/a
Select Net Profit as % of Largest Loss	-84.77%	-86.58%	n/a
Adjusted Net Profit as % of Largest Loss	-164.88%	-166.71%	n/a
Max. Consecutive Winning Trades	5	4	1
Max. Consecutive Losing Trades	2	2	0
Max. Shares/Contracts Held	200,000	200,000	200,000
Total Shares/Contracts Held	1,100,000	900,000	200,000
Account Size Required	$2,369.60	$2,369.60	$0.00
Total Commission	$0.00	$0.00	$0.00
Return on Initial Capital	-1.96%		
Annual Rate of Return	-54.78%		
Buy & Hold Return	-2.23%		
Return on Account	-82.91%		
Avg. Monthly Return	($982.30)		
Std. Deviation of Monthly Return	$1,315.64		
Return Retracement Ratio	-211.71		
RINA Index	n/a		
Sharpe Ratio	n/a		
K-Ratio	n/a		
Trading Period	12 days, 23 hours, 21 Minutes		
Percent of Time in the Market	26.30%		
Time in the Market	3 days, 9 hours, 53 Minutes		
Longest Flat Period	6 days, 22 hours, 14 Minutes		
Max. Equity Run-up(Daily)	$405.00		

Date of Max. Equity Run-up	2/25/2016 16:59		
Max. Equity Run-up as % of Initial Capital	0.40%		

Max. Drawdown(Daily)

Value	($2,369.60)	($2,369.60)	$0.00
Date	3/1/2016 08:08:23		
as % of Initial Capital	2.37%	2.37%	0.00%
Net Profit as % of Drawdown	-82.91%	-84.68%	n/a
Select Net Profit as % of Drawdown	-82.91%	-84.68%	n/a
Adjusted Net Profit as % of Drawdown	-161.26%	-163.05%	n/a

Max. Drawdown(Trade Close)

Value	($2,369.60)	($2,369.60)	$0.00
Date	3/1/2016 08:08:23		
as % of Initial Capital	2.37%	2.37%	0.00%
Net Profit as % of Drawdown	-82.91%	-84.68%	n/a
Select Net Profit as % of Drawdown	-82.91%	-84.68%	n/a
Adjusted Net Profit as % of Drawdown	-161.26%	-163.05%	n/a
Max. Trade Drawdown	($2,317.60)	($2,317.60)	$0.00

This was a very quiet week as I was incredibly busy with school work however I still learned some very important lessons:

- Never trade when you can't give your full attention to the trade:
- Several times during the week I made trades because I hadn't made any trades recently and then proceeded to miss my exit because I was busy doing something else.
- When trading based on news stories ensure that the market is reacting appropriately.
- I tried to jump the result of an existing housing sales report that I had expected to strengthen the USD, and then lost big when the opposite happened.
- Re-enforced the reason why you always stick with your strategy.
- Again didn't have time to follow a trade properly and tried to jump an indicator because I believed it was about to trigger only to lose big when the indicator never triggered.

I actually managed to lose all of my progress from the week prior this week so next week during break I plan on spending my time carefully watching and following my strategy.

Trade station kept freezing and wouldn't allow me to get the analyses for screenshot however:

2/16-2/22: Made approximately 10% over several small trades throughout the week.

2/23-3/1: Lost about 10% over several bad trades and false entries.

14.4 MATTHEW PUKSTA'S JOURNAL ENTRIES

Journal January 14, 2016 – March 4, 2016

Due to a series of health and personal issues it became apparent that I wouldn't have the proper time to dedicate to the project. With this as a consideration I decided to change my trading strategy from short term, high volume trades on the Forex to a long term trades on the stock market. I opted to put together a portfolio that would a lot me the ability to scale back my time commitment but still would allow me to fulfill my requirements to the IQP.

The first thing I bought into was gold, a move I made before the term started as a way of hedging my bets when the economic news broke about China. Gold, being a fear commodity and is commonly speculated when the market is uncertain and hectic, was a great buy as a way of securing wealth and retaining capital. I bought into gold at 30 ounces when gold was 1091.50 an ounce. As on today gold is at 1238.66, a total gain of $4,414.80 or 13.48% since January 18th.

Second for my stock market strategy I wanted two types of stocks, stocks I could hold for the year that would provide strong safe returns, and another group that would more than likely pay off but were a bit more risky and ambitious. Also with this being an election year and knowing how well defense and firearm sectors did leading up to the 2008 and 2012 elections I decided to focus on those markets. With that in mind, I selected 5 stocks. Olin Corporation, Sturm Ruger, IRobot, Luxottica, BAE systems. Olin Corporation I bought into on January 27th at 14.50 a share, I sold my 100 shares 2 days later at 16.31 a share on the 29th. Olin is a manufacturer of high caliber automatic and semi-automatic munitions for private use. I opted to move the stock from my current list to my watch list because it didn't have the movement in it that I required.

The second stock Sturm Ruger is a New Hampshire based firearms manufacturer. Being from New Hampshire I'm quite familiar with the company and with this being an election year, and New Hampshire's spring hunting season about to start I bought in for 115 shares. I bought in at 51.4 a share on January 14th. Knowing that as the election season continues gun sales will increase. In 2012 because of President Obama's pledge to ban new firearm sales, national weapon sales quadrupled. I predict similar results as the election continues. Currently Ruger's stock is 70.31, meaning I am up 2174.65, a 36% gain on investment.

Third is IRobot, a company that I will actually be working for this summer. With that in mind and since I am aware of their upcoming R&D schedule for new releases I am betting long on IRobot. I predict that IRobot will do great this summer and I expect at least a 10 to 15% stock increase. IRobot has huge releases planned for this year and will do excellent, they lead the market in high end robotics. I may have bought in to soon though, at 33.65 on February 5th, they are now down to 31.34, roughly a 120 dollar loss on the 50 shares I bought. I plan to hold the stock though as I am confident in major gains.

Fourth is the defense industry side of portfolio, BAE systems, one of the world leaders in drones, countermeasures, and developer of the government's new stealth fighter the F-35. I bought in during a lull in their value at 467.10 at the advice of a friend, a BAE employee. At this advice and from what I had read that they were expecting some major government contracts this year I opted to be bullish and buy in immediately following them losing a DARPA contract. I bought in for 467.10 for 120 shares. BAE is currently up 10% to 510.46. This is another stock I plan to hold for at least the election year, as long as the Republican Party promises an increase in military spending and they have a chance at winning this speculation will push up all defense industry stocks.

Fifth is a stock called Luxottica Group, an Italian corporation they are commonly in America by their mainstay product, Ray-Ban sunglasses. I bought in at 57.40 a share and it is currently 57.28, a 12 dollar loss on 100 shares. I bought because the high end eyewear market always does well in the

summer, and with this mild short winter and predictions for a long hot summer, I bought in on the notion they will perform well this summer. This is by far my riskiest stock but all indicators say that once the weather starts to improve so will their sales.

I also composed a watch list for stocks for the remainder of the year.

- Raytheon
- Exxon Mobil
- Shell
- CSX
- Chipotle

Raytheon is expecting a massive weapons deal from South Korea for their interceptor missile platform, if the deal goes through it would be worth 800 million dollars, also there are rumors that Raytheon made weapons (TOW missile launchers) are being sold to the Free Syrian Army to fight ISIS and Assad. If this becomes public knowledge and true then it would mean a bump in their stock value. Raytheon is also the developer of the Navy's new weapon, the railgun. It stands to reason that they will receive a massive contract from the Pentagon to build and install the new primary weapon on the Navy's new fleet of Zumult class cruisers.

Exxon Mobil and Shell are both companies that will rebound huge when oil goes up, I am waiting for either the Chinese economy to recover, a move by OPEC or a new Middle East conflict to drive the price back up. In the meantime both these companies will weather the low prices as they have huge natural gas departments that are still performing well since the 2009 war on coal began.

CSX is a stock that has traded sideways for years since the recession and the war on coal by president Obama. If it looks like a Republican is going to win I plan to buy into CSX in a major way, they lead the industry in infrastructure improvement to the tune of 36 million nationwide. If the war on coal ends I predict a solid recovery for this railways stock.

Lastly Chipotle, the McDonalds of my generation is steadily gaining. I plan to buy into Chipotle during its next lull but it will only continue to increase in value as their popularity increases.

15 TERMINOLOGY GLOSSARY