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Trading Intraday Volatility

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TRADING INTRADAY VOLATILITY

By

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ABSTRACT

Many people believe that there is no way to profit off of anomalies in the markets because the markets are either completely random or they always accurately reflect outside information and events. Others, however, believe that models can be found through historical testing that successfully beat the market (Williams, 2011, p. 13-15). This thesis presents a method for beating the market by trading intraday volatility. The researcher focused on trading corn futures contracts. A futures contract is simply a derivative that can be bought and sold. It represents an agreement to buy or sell at a future date. Futures contracts rarely result in the exchange of any physical product, however, because the contracts are usually traded away prior to the due date (Oxley, 2012, p. 192). The researcher proposes a strategy to profit by buying and selling futures contracts on a daily basis.

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Keywords: day-trading, futures, commodities

INTRODUCTION

An ongoing debate among investors about the financial markets is how efficient the markets truly are. The efficient market hypothesis states that markets cannot be beaten because they will always accurately and immediately reflect all external relevant information (Leshik & Cralle, 2011, p.133). In other words, the price of corn will always reflect current supply and demand. As soon as any impactful event occurs, such as a drought, the market immediately shifts. The efficient market hypothesis would also support the idea that the past is not in any way a predictor of the future. Many investors hold to the efficient market hypothesis and believe that it is impossible to predict the flow of the market in any way. There are other investors, however, that believe market trends can be predicted. These investors believe past market activity can teach us about future market activity (Williams, 2011, p. 13-15). As a result, they create algorithms based on strategies that historically would have been profitable. These investors that develop algorithms and trade for a quick profit are called speculators (Moore, 2014). If the algorithm the speculator created predicts that the market is going up, the speculator will go long or buy at the market. If the algorithm predicts the market is going down, the speculator sells or shorts the market. When a speculator is long, he will profit with an increase in price. When a speculator is short, he will profit with a decrease in price (Lim & Lim, 2011, p. 13). Therefore, as long as the formula is correct the speculator should technically never lose money when the price shifts either up or down. There are speculators that make money using technical analysis so it is probable that the market is not truly efficient. Although, there are some speculators that have been able to generate positive returns, there are also many that have lost significant amounts of capital. Developing a strategy for appropriate individual risk levels is of prime importance. Speculators

can essentially trade the entire collection of financial instruments. The strategy

proposed herein focuses on trading corn futures contracts.

Futures Overview

Futures are a derivative or a financial asset that derives its value from

another asset. Owning a futures contract means you have entered into an agreement

to buy or sell a product later in the future. Therefore, a futures contract tells you

what the projected price of a product is in the future. The future price of the product

will typically be slightly higher than the current price because it reflects the costs of

storing the product until that time period (Fabozzi, Fuss, & Kaiser, 2008, p. 551-

553). The large majority of futures contracts do not result in the actual exchange of

any product, though, because the contract holder sells the contract prior to the

contract date (Masover, 2001, p. 162). These contracts are typically sold many times

by speculators trying to make a profit. Without futures contracts, the only way to

make money directly off the rising prices of a bushel of corn would be to buy actual

bushels of corn and then sell them at a later time. Futures contracts allow this profit

to be made using paper instead of trading actual physical corn (Oxley, 2012, p. 192).

Each futures contract represents a pre-determined quantity of a product

(Fraser-Sampson, 2011, p.148). For example, one corn futures contract equates to

5,000 bushels of corn (DraKoln). If the price of the corn futures contract were $6 per

bushel, then that contract would be worth $30,000 ($6*5,000 bushels). An investor

can oftentimes purchase a mini-contract. A mini corn contract is 1,000 bushels.

Using the previous price of $6 per bushel, the mini-contract would be worth $6,000.

In general, mini-contracts require less capital but they are typically less liquid

markets as well (Clenow, 2012, p. 262). Since they are less liquid, it may be more

difficult to buy and sell them at the optimal time.

Futures contracts are unique because they are traded on margin. In the futures market, margin refers to the amount of money you need in your account so that brokers will allow you to trade. Speculators are not required to have the full amount of the contract in their account. Therefore, using the previous dollar figure, the speculator would not have to actually pay $30,000 to purchase the corn futures contract. Speculators are instead required to deposit initial margin. Initial margin is required by both the buyer and the seller regardless of what is being traded (Lioui & Poncet, 2005, p. 7). It is an amount that is set by the exchange. Speculators also need to consider maintenance margin. Maintenance margin is the amount required in the account before the investor will receive a margin call. For example, if we assume initial margin is $2,500 and maintenance margin is $2,000. The investor will not receive a margin call until his account drops beneath the $2,000. The margin call is a call requesting the money needed to bring the account back up to the initial margin amount (Heakal). Typically, initial margin for corn is about $2,300 while maintenance margin is about $1,750 ("Futures accounts &,").

Trading on margin seems like it should be lower risk because you have to have less money in your account than the full price of the contract. Speculators can lose the full value of their contract, however, if the market drops greatly. In other words, if the market dropped $0.40, the account value would drop $2,000 ($0.40*5,000 bushels). If this were to happen, a margin call would occur and the speculator would have to send more money to the broker. Therefore, speculators are risking the full value of the contract even though they only have to maintain margin costs in their account. Thankfully, there are limits on price movement that are set by the exchange. Currently, corn can only move $0.40 up or down per day (Kowalski).

Uses of Futures Contracts

Futures contracts are used by investors for two reasons: hedging and speculating. Hedgers use futures to remove the risk of price fluctuation. A detailed example of hedging is discussed in Appendix A. Futures are useful investments because they reduce the risk of price fluctuation.

Futures can also be used for speculation. Speculators are trying to make money off of the volatility or price change of futures contracts. They have no desire to hedge risk. They are actually assuming risk by purchasing the futures contract. If a speculator buys a corn contract at $5 he is hoping it will move to $6. If it does and the investor sells he will profit $5,000 (($6-$5)*5,000 bushels) less trading cost. Speculators represent a large amount of the sellers and buyers in an exchange. As a result of speculation, futures contracts are much more liquid. Without speculators, there would be a greater chance of a hedger not having a buyer when they need to either buy or sell a futures contract.

METHODS

[REDACTED]

Pros and Cons

[REDACTED]

RESULTS

[REDACTED]

Quantitative Data

[REDACTED]

DISCUSSION

The researcher hypothesized that the proposed strategy would work more efficiently if the trend of the corn futures prices was bullish instead of bearish. Bullish markets refer to markets that are trending up. Contrary, bearish markets refer to markets that are trending down (Denning, 2005, p. 9). As a result, the researcher used technical analysis to attempt to determine the trends of the corn prices. The researcher utilized Momentum 10,20 and Mod Stochastic 14,3.

Momentum 10,20 measures how fast prices are changing and graphs it on a line graph. Theoretically, if the slope of the line is positive, the trend of corn prices is bullish. If the slope of the line is negative, the trend of corn prices is bearish ("Classic chart indicators,"). The process for calculating Momentum 10,20 is discussed in Appendix M.

Mod Stochastic 14,3 is a more complex computation. The general idea behind the analysis is that when there is a bullish trend closing prices tend to be at the top end of the day's trading range. The opposite is true for bearish trends. When a trend is bearish, closing prices tend to be at the bottom of the day's trading range (Murphy, 1999, p. 246). Appendix N discusses how to calculate Mod Stochastic 14,3.

The researcher then tabled these two trends together over the last eight complete years and attempted trading only when both Momentum 10,20 and Mod Stochastic 14,3 indicated there was a bullish trend. The results were not as profitable as trading every day regardless of trend.

The researcher also considered when both Momentum 10,20 and Mod Stochastic 14,3 were indicating a bearish trend. In this incidence, instead of buying at the open, the researcher sold at the open (short selling). This strategy still was not as profitable as trading every day regardless of the trend.

These results led to two possible conclusions. Either Momentum 10,20 and Mod Stochastic 14,3 are not adequate indicators of the trend or the trend does not affect the current strategy.

Further Research

There are hundreds of different ways to change a trading strategy so that it is potentially more profitable. As a result, research on a trading strategy is never done. There are a few main questions that the researcher would like to study further.

1. Is there a futures contract or other derivative that would be more profitable using the proposed strategy than corn futures contracts? This question could be answered by making a spreadsheet in excel with built-in formulas. Prices for different contracts could be copied and pasted into the spreadsheet and the math would be computed instantly.

2. Is there a more appropriate way to combine best-case and worst-case scenarios? There may be backtesting software that could be purchased that would test the strategy historically.

3. Is it possible to ensure buying right at the open? Even if the trader enters in the trade a second after the market opens, the price has shifted. There was no way for the researcher to account for how much this shift would have been. As a result, there is increased risk. There may be a way to ensure buying right at the open and thereby taking advantage of the initial price movement.

4. Are there indicators that show the trend more accurately than Momentum 10, 20 and Mod Stochastic 14,3? There is still not enough conclusive evidence to determine the trend has no effect on the strategy. Additional indicators need to be tested to ensure the trend is accurately predicted.

Conclusion

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APPENDIX A

Using Futures to Hedge

The following is a simple example of how a farmer would use futures contracts to limit price fluctuation risk. If it is currently March and the farmer wants to sell corn in September, he would short a futures December corn contract at $5. In September, the actual price and the futures price have dropped a dollar and is now $4. He would sell his corn at the actual price of $4 and trade his futures contract at $4 and gain $1 on the contract. Therefore the actual selling price of $4 and the gain from the futures contract of $1 results in a total gain of $5. In this manner, the farmer locked in the price of $5. If the corn commodity price were to raise to $6 instead of dropping, the farmer would sell his corn in September at $6 and also buy his short contract back at $5. He would gain $6 from selling the corn but lose $1 on his futures contract and therefore essentially profit $5 from selling his grain (Horcher, 2005, p. 135).

APPENDIX B

[REDACTED]

APPENDIX C

[REDACTED]

APPENDIX D

[REDACTED]

APPENDIX E

[REDACTED]

APPENDIX F

[REDACTED]

APPENDIX G

[REDACTED]

APPENDIX H

[REDACTED]

APPENDIX I

[REDACTED]

APPENDIX J

Best Case

[REDACTED]

Best-Case Summary Continued

[REDACTED]

Best-Case Summary Continued

[REDACTED]

APPENDIX K

Worst Case

[REDACTED]

Worst-Case Summary Continued

[REDACTED]

Worst-Case Summary Continued

[REDACTED]

APPENDIX L

Combined

[REDACTED]

Best-Case and Worst-Case Combined Continued

[REDACTED]

Best-Case and Worst-Case Combined Continued

[REDACTED]

APPENDIX M

Momentum 10,20 Calculation

To calculate momentum, subtract the closing price 10 days ago from the current closing price. This subtraction is done for the next 20 days until you have 20 numbers representing the closing price 10 days ago subtracted from the last closing price. Those 20 numbers are then added and divided by 20 to give you an average of the momentum over the last 20 days. This average is then plotted on a graph. It gives you a line with both positive and negative slopes. A positive slope refers to a bullish trend while a negative slope refers to a bearish trend ("Classic chart indicators,").

APPENDIX N

Mod Stochastic 14,3 Calculation

To calculate the Mod Stochastic 14,3 subtract the lowest low in the last 14 days from the close. Divide that number by the max of the last 14 days high minus the minimum of the last 14 days low. Multiply that number by 100 and you have the raw stochastic. Average the last 3 raw stochastic and the number you have is called %K. Average the last 3 %K numbers and the number you have is %D. If %K is greater than %D than you have a bullish trend. The opposite is true as well. If %K is less than %D than the trend is bearish ("Classic chart indicators,").