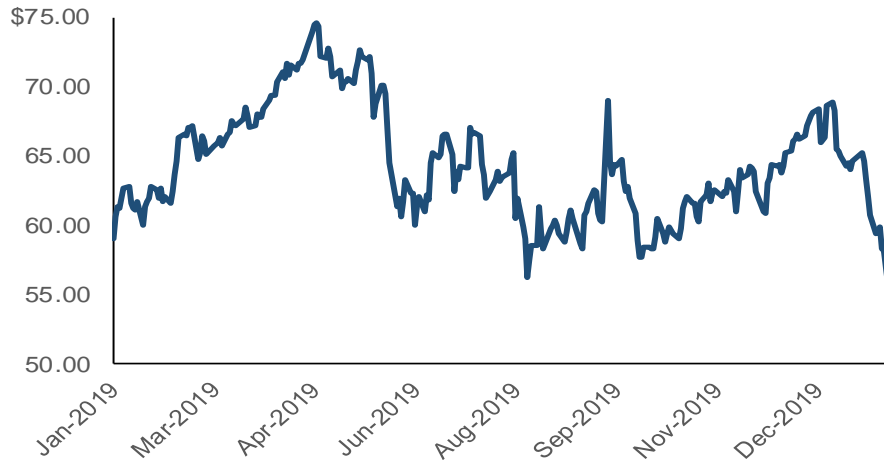


### Spot Brent Crude Oil



COJ0

Underlying Price: \$55,800

Trade Name: Iron Condor (2P:2C)

Expiration Date(s): February 25<sup>th</sup>, 2020

Delta: 0.37

Gamma: -9.03

Theta: -0.12

Vega: -11.33

Rho: 0.01

### Energy Sector

Sector Size: \$142,857,142.00

# of Holdings: 0.00

Lead Associate:

Rainy Zhang  
rainy Zhang15@gmail.com

Chief Investment Officer:

Justin Shea-Katz  
jsheakatz@gmail.com

Lead Analysts:

Jordan Gerlach  
jger12@live.com

Director of Education:

Chris Vaughan  
vaughanc7298@gmail.com

Lead Analyst

Noah Webbere  
noahwebbere@gmail.com

Director of Economics

Liam Callahan  
liam.callahan00@gmail.com

- I. Macroeconomic Overview
- II. Trade / Hedge
- III. Product Analysis
- IV. Technical Analysis
- V. Risk Analysis
- VI. Capital Allocation

# I. Macroeconomic Overview

## Macroeconomic Overview

### Macroeconomic Drivers

#### Driver #1: Coronavirus

- Since news of the coronavirus was released, China has quarantined at least 16.00 cities
  - ~50.00 mm citizens on lockdown
  - No transportation in and out of Wuhan which is China's fifth largest city.
- Other countries are limiting transportation in and out of China
- Chinese government extends Lunar New Year in an attempt to contain the virus
- The decrease in travel has caused a sharp drop in Brent crude oil demand leaving a negative effect on the prices

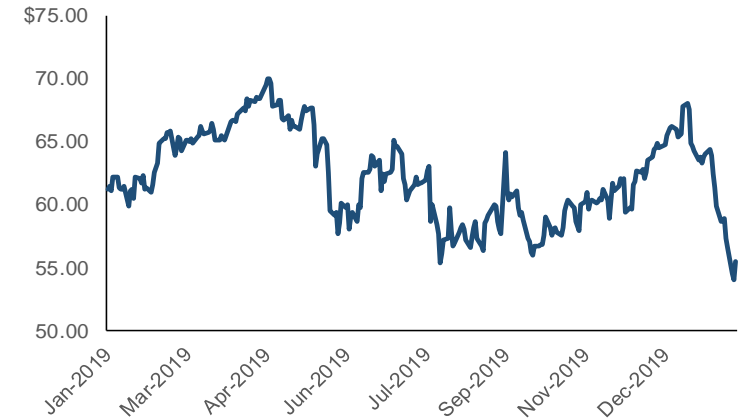
#### Driver #2: China & India's Economy

- China and India accounted for ~60.00% of oil demand growth from CY2008 – CY 2018
  - Due to the quarantines and extended holiday, China's demand for oil has fallen by 20.00%
  - China's GDP grew 6.10% in CY2019, which is the least it has grown since CY1990
  - India experienced a sharp slowdown in CY2019 due to demonetization and tax reform
    - GDP expanded 4.50% in CY2019 which is the slowest growth it has seen since CY2013
    - Expected to grow 5.00% in CY2020

#### Driver #3: Supply and Demand of Brent Crude

- OPEC+ has pushed up a meeting to discuss possible supply cuts in order to counteract these affects
- Tankers are leaving Libya's ports without cargo
  - At least 4.00 tankers capable of carrying 3.00 MM barrels of crude have left and more are preparing to leave
- U.S manufacturing showed an expansion in their latest PMI score (50.90)
  - U.S. manufacturing growth translates into a greater demand for oil.

### COJ0 Contract Price



### Market Pros & Cons



- Conflicting global events causing potential for both a price increase and decrease



- Global oil demand is already priced in causing a lower volatility short term



- OPEC+ elects not to cut production



- Coronavirus seizes to be a threat to the global demand

## II. Trade / Hedge

## Trade Breakdown

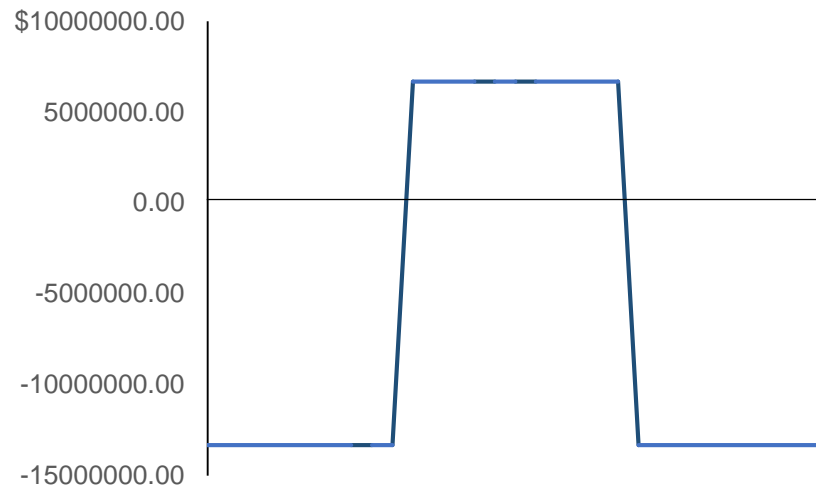
## Trade Breakdown

Long Put: 20,000.00 OTM  
 Short Put: 20,000.00 OTM  
 Short Call: 20,000.00 OTM  
 Long Call: 20,000.00 OTM

Expiration: Feb. 25th 2020  
 Delivery: Feb. 27th 2020

Iron Condor COJ0

## Iron Condor Payoff Graph



## Trade Breakdown

## Setup

- Long 20,000.00 OTM Puts
  - **Strike: \$49.00**
- Short 20,000.00 OTM Puts
  - **Strike: \$50.00**
- Short 20,000.00 OTM Calls
  - **Strike: \$60.00**
- Long 20,000.00 OTM calls
  - **Strike: \$61.00**
- **Expiration:** February 25, 2020

## Profit Potential

- Max Profit = \$6,680,000.00
  - Contract expires where spot is in-between the short put and call strike prices

## Risk Potential and Exit Strategy

- Max Loss = \$13,320,000.00
  - Contract expires where spot < \$50.00 or > \$60.00
  - Exit Point: Hold position until expiration

## Breakeven Points

- **Breakeven** = \$50.50 (-4.30%) and \$60.50 (+11.31%)

## Time

- Favorable time decay as we want all the options to remain OTM and expire worthless to collect the max premium

## Implied Volatility

- Short Vega as lower volatility increases the chance of the options finishing OTM

# III. Product Analysis

## Greeks and Theoretical Edge

### Greeks

	Price		Delta	Gamma	Theta	Vega	Rho
Put option	\$0.1903		(0.0858)	0.0336	(0.0164)	0.0211	(0.0029)
Put option	\$0.6104		(0.1808)	0.0445	(0.0349)	0.0354	(0.0063)
Call option	\$2.0422		0.5079	0.0752	(0.0491)	0.0537	0.0155
Call option	\$0.3025		0.1278	0.0424	(0.0237)	0.0281	0.0040

### Breakdown of Greeks

**Delta** (Varying): With a Delta value of 0.37 this indicates the value of the asset is trending towards the price of the underlying asset.

**Gamma** (Negative): The position is short gamma which is a bet against a substantial movement of the underlying

**Theta** (Negative): The probability of earning max payoff increases as time decays. The less time the greater potential for the options ending OTM.

**Vega** (negative): Decreases in implied volatility present a greater statistical chance of the long options ending OTM.

**Rho** (Varying): Changes in the interest rates will have a relatively small effect on the trade as the rate is unlikely changed much during the one-month term of the contract.

### Breakdown Theoretical Edge

*Iron Condor:*

#### **Vega:**

- Lower implied volatility will benefit the trade as it decreases the chance of the underlying moving outside of the breakeven points.
- Vega decreases as time closes in on expiration and is low at contract conception because all strikes are OTM.

#### **Theta:**

- The premiums of the short puts and calls increase as time passes due to a increase in the likelihood that the trade will expire OTM. Theta is the most when ATM for our position.

#### **Rho:**

- Because of the length of the contract (one month), changes in interest rates will have a relatively small effect on all of the options premiums. Large changes in rates during the contracts length are unexpected.

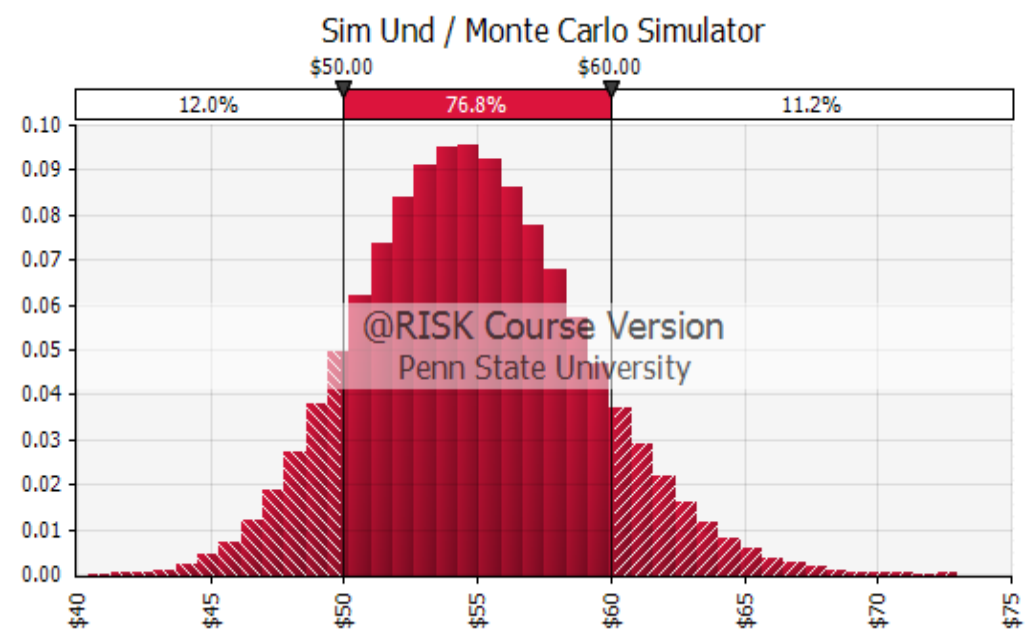
#### **Gamma:**

- Gamma is the highest ATM because that is when the change in delta is greatest. The trade benefits from gamma, but time decay quickly erodes the effects of gamma on the position.



Probability Distributions

Price Movement Probability



Price Movement Probability

The Monte Carlo Simulator normalized our distribution and calculated that the price will fall between \$50.00 and \$60.00 76.80% of the time. The asset price has to fall between the strike prices of \$50.00 and \$60.00 in order for the iron condor to finish profitable.

The simulation with our breakeven points as end points indicates that there is a 23.20% chance the trade will not be profitable. This assumes constant volatility.

	PV Payoff	MV Valuation	MV Min	MV Max	MV STD	Iterations
Call	\$ 5.69	\$ 5.94	\$ -	\$ 23.27	\$ 3.86	10,000
Put	\$ -	\$ 0.11	\$ -	\$ 8.52	\$ 0.52	10,000

	PV Payoff	MV Valuation	MV Min	MV Max	MV STD	Iterations
Call	\$ 4.68	\$ 9.84	\$ -	\$ 27.96	\$ 4.17	10,000
Put	\$ -	\$ 0.01	\$ -	\$ 4.54	\$ 0.10	10,000

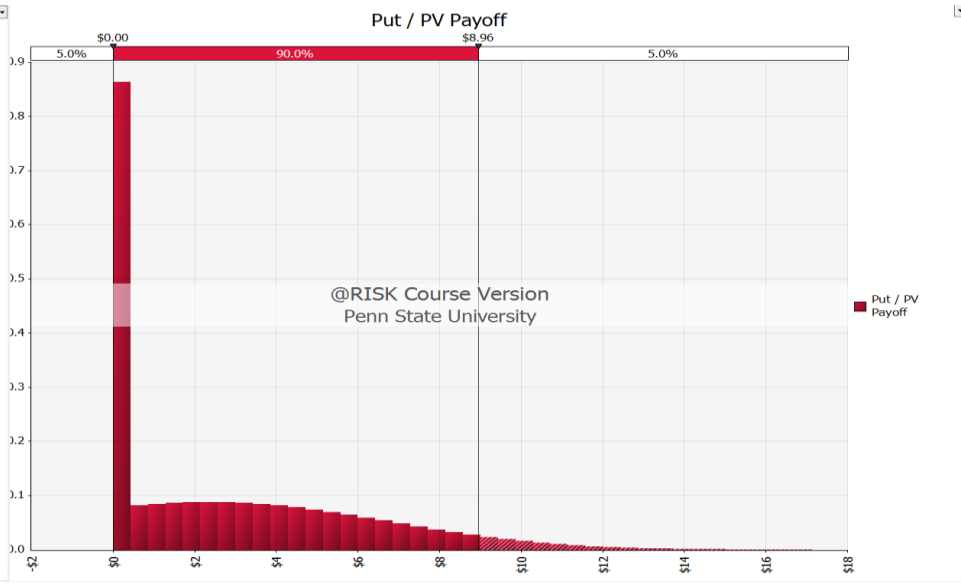
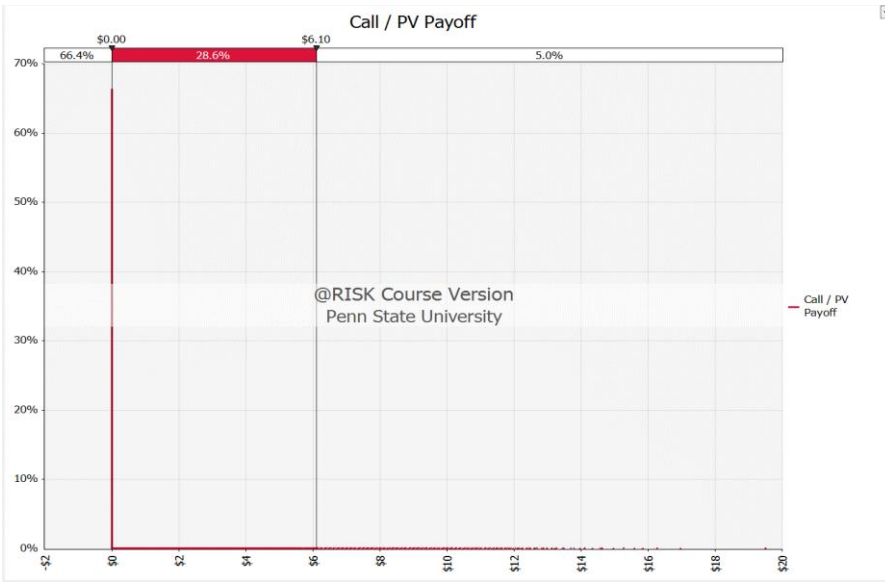
Probability Distributions

	PV Payoff	MV Valuation	MV Min	MV Max	MV STD	Iterations
Call	\$ -	\$ 9.84	\$ -	\$27.96	\$ 4.17	10,000
Put	\$ 5.31	\$ 0.01	\$ -	\$ 4.54	\$ 0.10	10,000

	PV Payoff	MV Valuation	MV Min	MV Max	MV STD	Iterations
Call	\$ -	\$ 5.94	\$ -	\$23.27	\$ 3.86	10,000
Put	\$ 6.30	\$ 0.11	\$ -	\$ 8.52	\$ 0.52	10,000

Call PV Payoff Diagram

Put PV Payoff Diagram



# Product Drivers

## Product Drivers

### Driver #1: Speed of the Market

- Brent crude's 30.00 day volatility is 31.67%
- The Raw BETA of Brent is 1.05 in comparison to WTI's value of 1.14
  - Indicating a relatively slower moving market
  - For an equal impact on supply and demand Brent prices will change by a lesser amount
  - A BETA above 1.00 indicates an assets tendency to deviate back towards the mean after a swing

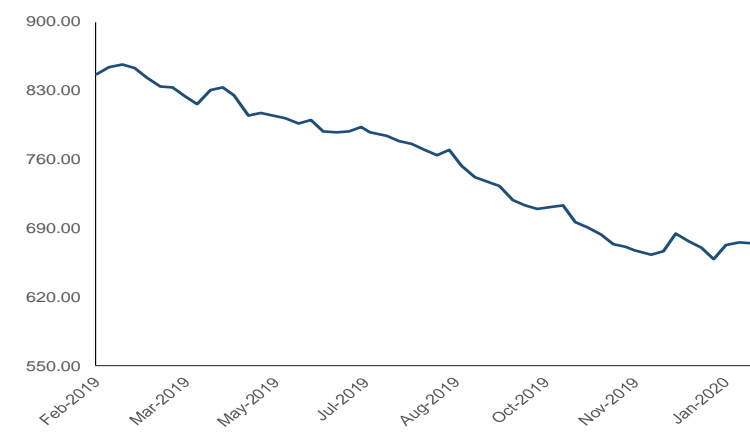
### Driver #2: Product is being Oversold

- EIA predicts non-OPEC oil supply to grow at 2.60 MM Bbl/d
  - Last week Baker Hughes reported a decline in 251.00 oil rigs operating in North America YoY
- The Relative Strength Index of Brent crude is ~18.70
  - A reading below 30.00 considers a product to be oversold
- The Stochastics Oscillator indicates Brent crude at a score of ~-5.85
  - A reading below 30.00 on this scale also considers a product to be oversold
- Current prices are approaching support levels
- Theoretically this means that Brent crude is currently trading at a price lower than its intrinsic value
  - This shows potential signs of a price correction





### Driver #3: Decrease in Demand

- China's independent refiners cut processing an additional 20.00% from 30.00% to 50.00% in a little over a week
  - China's manufacturing sector is substantially slowing down as the Chinese New Year holiday has been extended and laborers are working less
- Low freight demand due to the coronavirus and the uncertainty it fosters on the global economy lead to less cargo ships at sea

## North American Rig Count MoM



## Product Pros & Cons

- 
  - Airlines and gasoline companies buy their fuel months in advance, effectively pricing in their demand
- 
  - Majority of OPEC+ countries rely on Brent exports for a large portion of their GDP
- 
  - Unpredictability in middle eastern tensions
- 
  - Large global presence creates a greater opportunity for substantial price fluctuations

# IV. Technical Analysis

## Technical Analysis



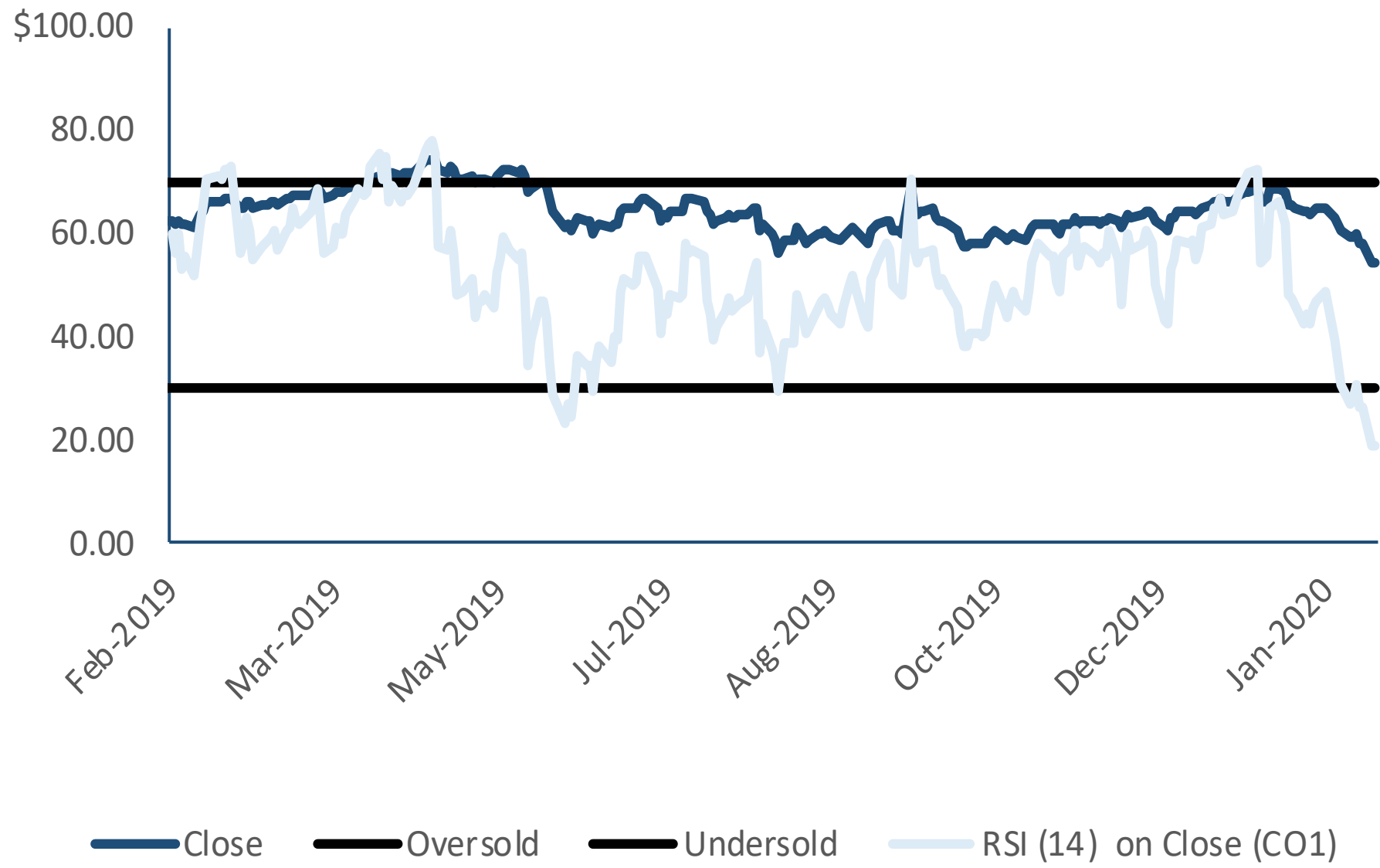
## Relative Value Analysis



# COJ0 Relative Strength Index



## Technical Analysis



# V. Risk Analysis

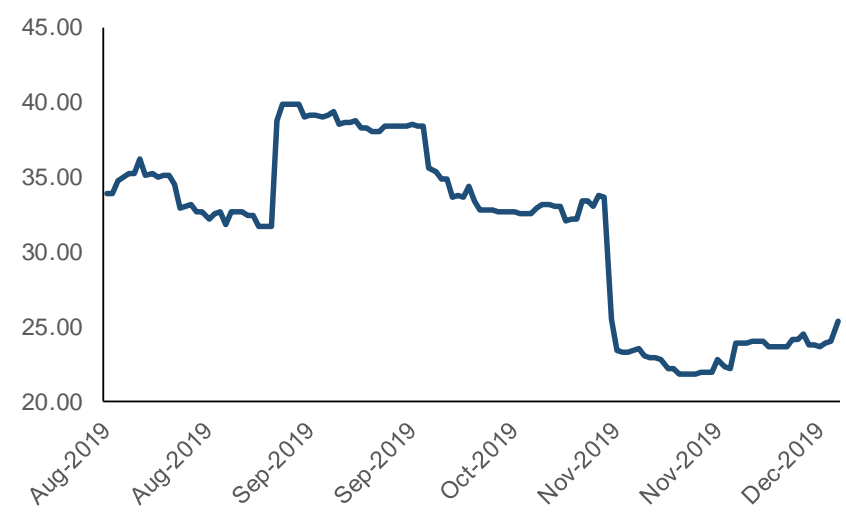


# Risk Analysis

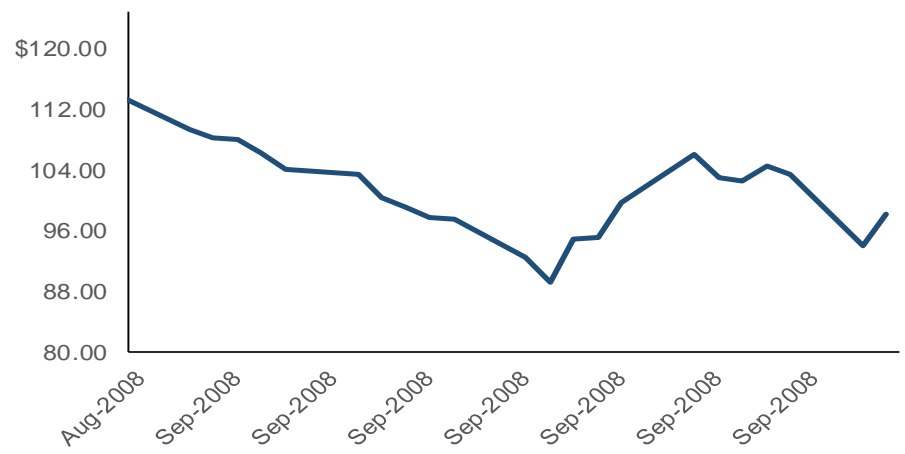
## Major Risks

- Risk #1: Coronavirus severely spreads into other countries
  - If the virus gets worse and more countries begin to take travel precautions, the demand will continue to decrease
  - A demand decrease will cause a larger price drop
  - Cases are ~25,000.00 and deaths are nearing 500.00
- Risk #2: Brent is more susceptible to international events
  - ~70.00% of all global crude contracts reference Brent
  - Over half of China's crude petroleum imports are Brent crude
- Risk #3: OPEC+ cuts cause prices to increase
  - If OPEC+ makes a serious cut it could cause prices to rise at a rapid rate
  - In the beginning of the great recession OPEC cut production by 2.20 MM Bbl/d boosting the price \$16.22 (18.85%)

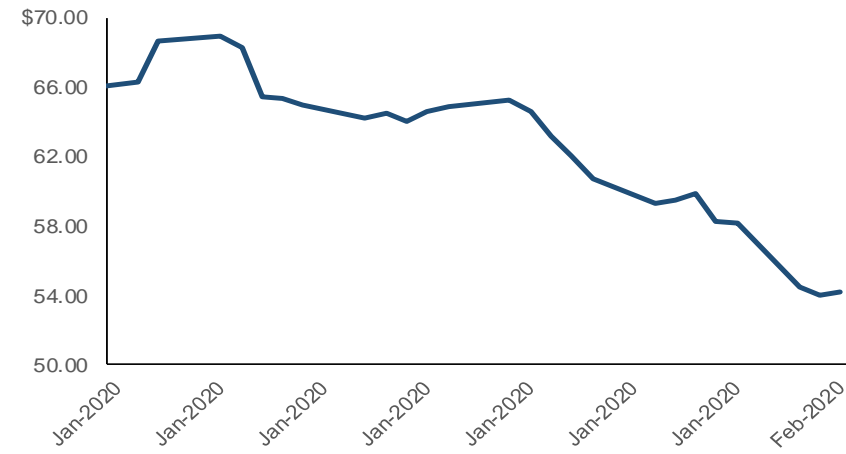
## COJO 60.00 Day Volatility



## Brent Spot Great Recession



## Brent One-Month Spot



# VI. Capital Allocation

## Asset Allocation

### Sector Portfolio Overview

Energy Sector Portfolio	
Capital Allocated	\$142,857,142.00
Cash Available	\$142,857,142.00
PnL	\$0.00
% Return	0.00%

### Associate and Analyst Overview

Capital Allocated	\$142,857,142.00
Cash Available	\$142,857,142.00
PnL	\$0.00
% Return	0.00%

Capital Allocated	\$142,857,142.00
Cash Available	\$142,857,142.00
PnL	\$0.00
% Return	0.00%

### Physical Data

				Options Book					
Underlying Price	Strike	ITM / ATM / OTM	Notional Amount	Current Price	PnL Current	Expiration Date	Selling Date	Selling Price	Final PnL
\$54.80	\$49.00	OTM		\$56.02		2/25/20			
\$54.80	\$50.00	OTM		\$56.02		2/25/20			
\$54.80	\$60.00	OTM		\$56.02		2/25/20			
\$54.80	\$61.00	OTM		\$56.02		2/25/20			