

# Commodity Price Outlook & Risks

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*This monthly report presents a price outlook and risk assessment for selected commodities as depicted from futures and options markets.*

**Outlook.** Oil spot prices are around 47 dollars mainly reflecting a decrease in non-OPEC production and various supply disruptions, including a wildfire in Canada and rebel attacks in Nigeria. Futures markets continue pointing to a modest increase over the next year, though uncertainty remains high amid sustained oil production growth and geopolitical risks. Gasoline prices are expected to remain steady throughout the summer and slightly decline in lower demand winter months, while U.S. natural gas prices are projected to rise in the coming winter and decline thereafter; both following seasonal patterns. Metal prices are expected to remain broadly unchanged following ample supply and continued slow demand. The outlook for agricultural commodity prices continues to be mixed, with corn, coffee, rice and wheat prices increasing on weather concerns, but soybean and soybean meal prices moderately decreasing.

**Risks.** The likelihood of per-barrel prices for WTI falling below \$25 in the next 12 months dropped to 3 percent from 5 percent, and the likelihood of Brent falling below \$25 decreased also to 3 percent. The likelihood of WTI and Brent oil prices rising above \$60 increased, signaling an upward shift in the balance of risks. Overall uncertainty stays at a significantly high level.

The likelihood of per-MMBtu U.S. natural gas prices below \$1.5 (12 months forward) decreased to 1 percent from 4 percent, while the probability of prices rising above \$3.5 increased to 12 percent from 6 percent, suggesting an upward shift in the balance of risks.

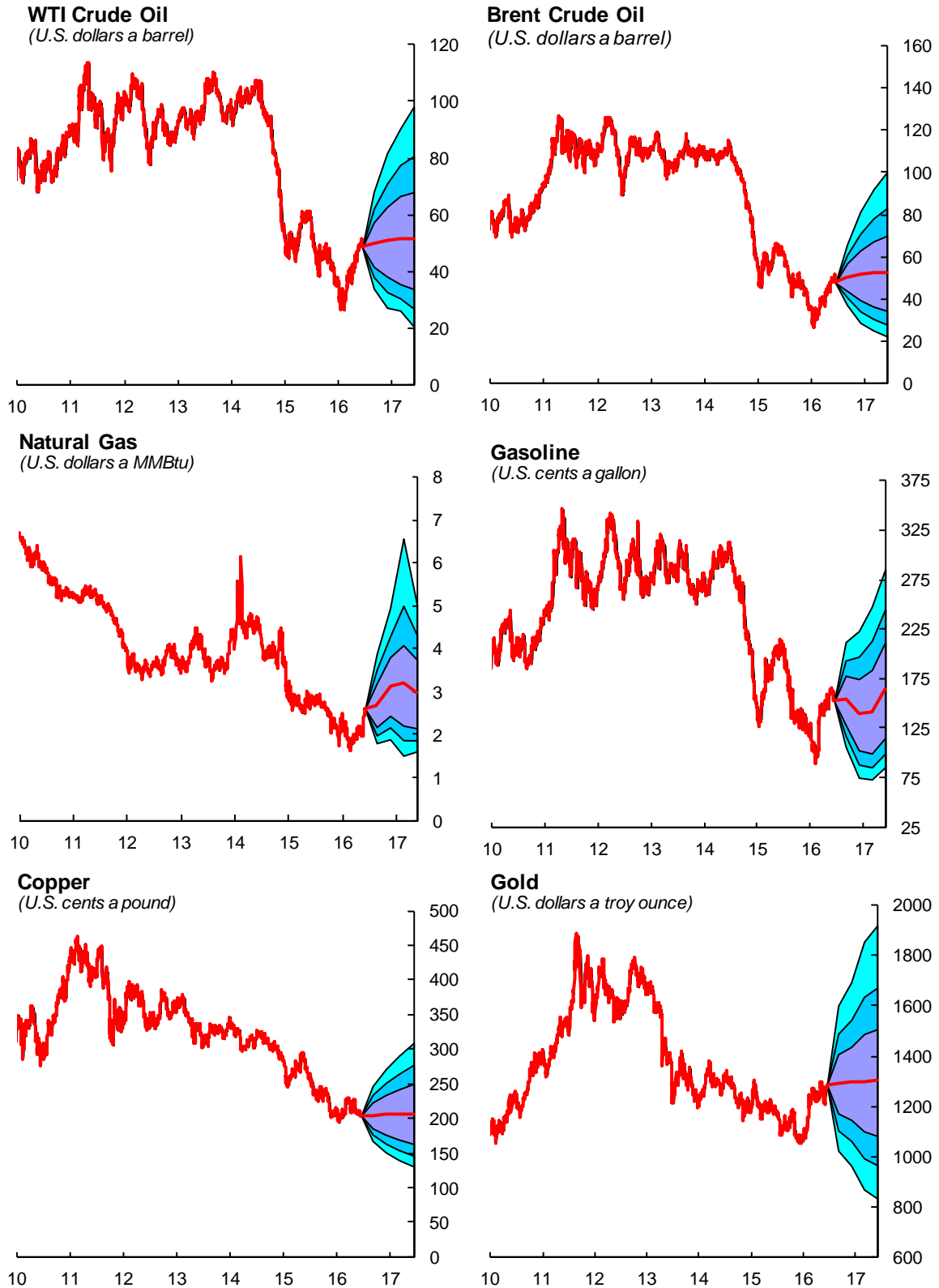
For metals, the risk of copper prices falling below \$1.5 a pound slightly increased to 10 percent from 9 percent, and the probability of prices increasing above \$2.5 a pound decreased from 13 percent to 10 percent, due to slow down of China's imports. The probability of gold prices falling below \$900 a troy ounce remained broadly unchanged at 5 percent, while the probability of an increase beyond \$1500 increased to 11 percent from 10 percent last month.

The likelihood of per bushel corn prices below \$2.5 decreased to 11 percent, while the probability of prices increasing above \$5 increased to 12 percent from 4 percent in May. The likelihood of soybean meal prices rising above \$450 a short ton rose to 14 percent from 8 percent. Meanwhile, the likelihood of per-bushel soybean prices below \$7 slightly decreased to 3 percent from 4 percent, and the probability of an increase above \$13 increased to 12 percent from 7 percent last month, on account of weaker production prospects from South America.

**Contents.** Fan charts (pages 2-3) show historical and forward futures prices (red line), with calculated confidence intervals of +/- 2 standard deviations (in purple/blue). Confidence intervals are derived from prices of options on June 14, 2016. Likelihoods of spot prices rising/falling from specified price thresholds occurring at the 3-, 6-, 9- and 12-month forward (or closest available) horizons for each commodity are shown in tabular form (pages 4-5). In addition to price thresholds, the probability of each commodity spot price rising/falling by a certain percentage is shown (pages 6-7). Relevant contract specifications for each commodity are also shown (page 8).

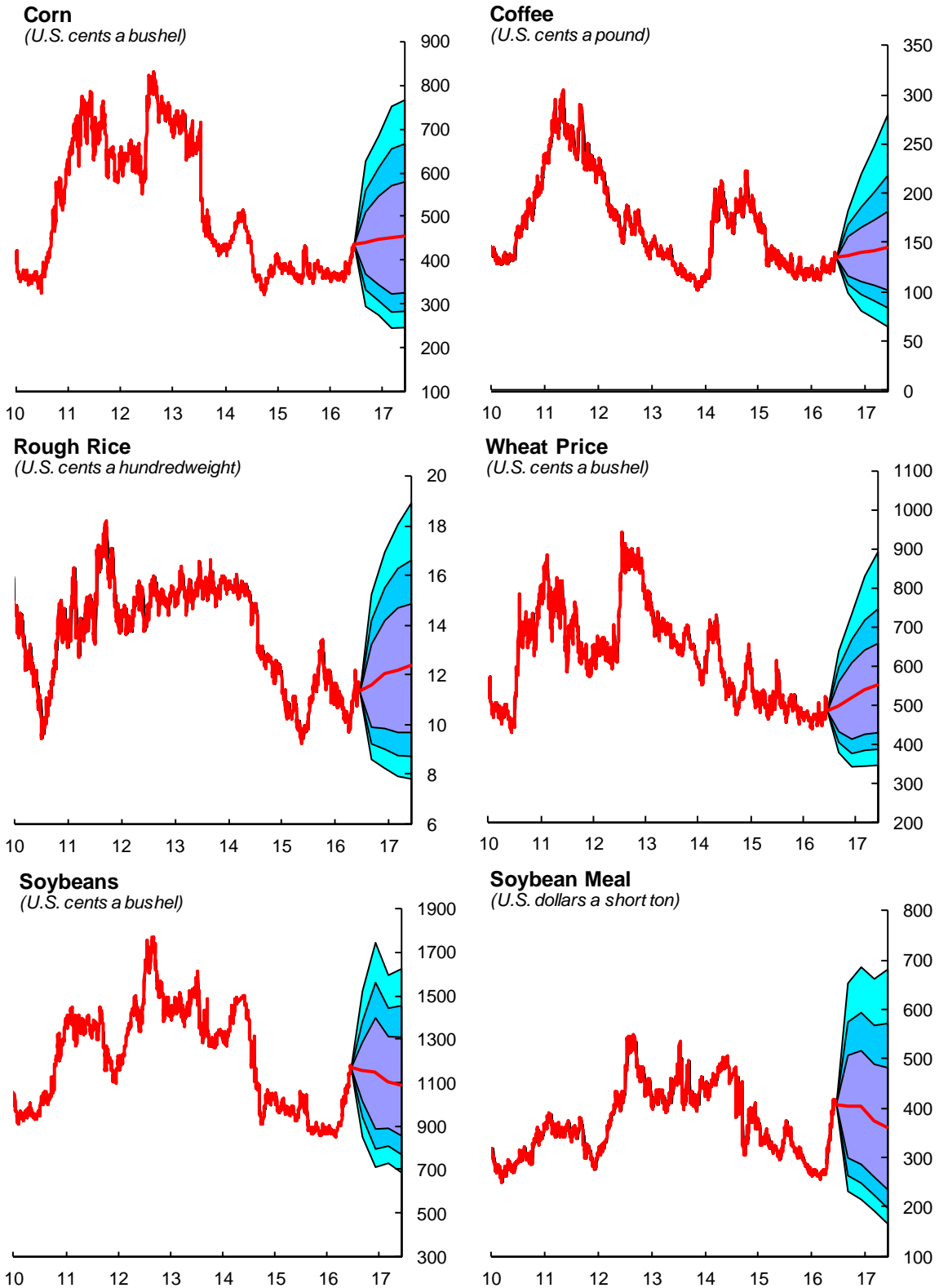
## Selected Commodities—Market Price Outlook and Risks

95% confidence interval    86% confidence interval    68% confidence interval    Futures



## Selected Commodities—Market Price Outlook and Risks (concluded)

■ 95% confidence interval   
 ■ 86% confidence interval   
 ■ 68% confidence interval   
 — Futures



## Options-based Price Thresholds

### WTI Crude Oil

(probabilities in percent; prices in U.S. dollars a barrel)

Threshold Prices	Months Forward			
	3	6	9	12
< 20	0.0	0.1	0.1	0.8
< 25	0.1	1.1	1.4	3.4
< 30	0.8	4.0	6.3	9.0
< 35	3.6	11.0	16.9	18.9
> 40	86.9	76.2	67.7	67.1
> 45	65.7	58.2	50.8	51.3
> 50	38.4	39.1	35.4	36.3
> 55	17.5	23.5	23.3	24.2
> 60	6.7	12.9	14.6	15.3
> 65	2.3	6.7	8.8	9.4
> 70	0.8	3.3	5.2	5.6

### Brent Crude Oil

(probabilities in percent; prices in U.S. dollars a barrel)

Threshold Prices	Months Forward			
	3	6	9	12
< 20	0.0	0.1	0.3	0.5
< 25	0.0	0.7	1.6	2.8
< 30	0.3	3.0	5.8	8.3
< 35	1.5	8.7	14.4	18.0
> 40	93.5	79.8	72.2	68.6
> 45	75.6	62.1	55.8	53.3
> 50	44.5	42.3	39.8	38.9
> 55	18.1	25.4	26.4	26.7
> 60	5.6	13.8	16.4	17.4
> 65	1.6	7.0	9.8	11.0
> 70	0.6	3.5	5.7	6.8

### U.S. Natural Gas

(probabilities in percent; prices in U.S. dollars an MMBtu)

Threshold Prices	Months Forward			
	3	6	9	12
< 1.00	0.0	0.0	0.1	0.0
< 1.50	0.2	0.5	2.2	1.4
< 2.00	8.9	5.1	12.7	13.5
> 2.50	54.4	74.0	61.9	57.7
> 3.00	18.2	39.7	33.1	28.7
> 3.50	4.0	15.0	14.5	11.5
> 4.00	0.7	4.6	5.8	4.1
> 4.50	0.1	1.4	2.3	1.4
> 5.00	0.0	0.4	1.0	0.5
> 5.50	0.0	0.1	0.5	0.2
> 6.00	0.0	0.1	0.2	0.1

### Gasoline

(probabilities in percent; prices in U.S. dollars a gallon)

Threshold Prices	Months Forward			
	3	6	9	12
< 0.25	0.0	0.0	0.0	0.0
< 0.50	0.0	0.0	0.0	0.0
< 0.75	0.0	1.5	1.9	0.6
> 1.00	98.7	87.0	84.4	92.2
> 1.25	85.3	59.0	56.6	71.5
> 1.50	46.9	28.9	29.8	45.0
> 1.75	13.7	10.8	13.2	23.8
> 2.00	2.8	3.3	5.2	10.9
> 2.25	0.5	0.9	1.9	4.6
> 2.50	0.1	0.2	0.7	1.8
> 2.75	0.0	0.1	0.2	0.7

### Copper

(probabilities in percent; prices in U.S. dollars a pound)

Threshold Prices	Months Forward			
	3	6	9	12
< 0.75	0.0	0.0	0.0	0.0
< 1.00	0.0	0.0	0.0	0.1
< 1.25	0.0	0.1	0.6	1.6
< 1.50	0.2	2.6	6.1	9.7
< 1.75	6.8	17.2	24.0	29.2
> 2.00	54.6	49.8	47.1	45.0
> 2.25	11.5	18.7	21.6	23.2
> 2.50	1.3	5.1	7.9	10.2
> 2.75	0.1	1.2	2.5	4.0
> 3.00	0.0	0.2	0.7	1.4
> 3.25	0.0	0.0	0.2	0.5

### Gold

(probabilities in percent; prices in U.S. dollars a troy ounce)

Threshold Prices	Months Forward			
	3	6	9	12
< 700	0.0	0.0	0.3	0.5
< 800	0.0	0.2	1.2	1.7
< 900	0.3	1.2	3.6	4.6
< 1000	2.1	4.3	8.4	10.0
> 1100	92.4	88.4	81.6	79.2
> 1200	75.1	70.0	63.2	61.0
> 1300	40.7	40.7	40.0	39.6
> 1400	14.4	17.6	21.2	22.2
> 1500	4.7	6.9	10.3	11.4
> 1600	1.7	3.0	5.1	5.9
> 1700	0.6	1.4	2.7	3.2

## Options-based Price Thresholds (concluded)

### Corn

(probabilities in percent; prices in U.S. dollars a bushel)

Threshold Prices	Months Forward			
	3	6	9	12
< 2.0	0.0	0.0	0.2	0.2
< 2.5	3.0	6.0	11.0	10.6
< 3.0	11.8	20.5	27.2	26.4
> 3.5	66.4	57.7	52.8	54.0
> 4.0	35.6	35.8	34.3	35.6
> 4.5	14.2	19.4	20.4	21.5
> 5.0	5.1	9.5	11.3	12.1
> 5.5	1.9	4.3	5.9	6.5
> 6.0	0.7	1.8	3.0	3.3
> 6.5	0.3	0.7	1.5	1.7
> 7.0	0.1	0.3	0.7	0.8

### Coffee

(probabilities in percent; prices in U.S. dollars a pound)

Threshold Prices	Months Forward			
	3	6	9	12
< 0.6	0.0	0.2	0.4	0.7
< 0.8	0.2	1.8	2.9	4.3
< 1.0	2.8	8.3	11.5	15.0
< 1.2	23.3	30.1	33.4	37.2
> 1.4	35.7	36.8	37.2	36.8
> 1.6	9.4	13.9	16.2	18.0
> 1.8	1.7	4.6	6.4	8.0
> 2.0	0.3	1.6	2.6	3.6
> 2.2	0.1	0.7	1.2	1.7
> 2.4	0.0	0.3	0.6	0.9
> 2.6	0.0	0.1	0.3	0.5

### Rough Rice

(probabilities in percent; prices in U.S. dollars a hundredweight)

Threshold Prices	Months Forward			
	3	6	9	12
< 0.07	0.0	0.2	0.6	0.8
< 0.08	0.8	2.0	3.3	3.7
< 0.09	5.9	8.5	11.1	11.3
< 0.10	20.8	22.3	25.0	25.0
< 0.11	44.6	41.6	42.8	42.6
> 0.12	31.5	38.5	39.5	39.8
> 0.13	14.6	22.5	24.8	25.2
> 0.14	5.7	11.8	14.4	14.7
> 0.15	1.9	5.7	7.8	8.1
> 0.16	0.6	2.5	4.0	4.3
> 0.17	0.2	1.0	2.0	2.2

### Wheat

(probabilities in percent; prices in U.S. dollars a bushel)

Threshold Prices	Months Forward			
	3	6	9	12
< 2.5	0.0	0.0	0.1	0.1
< 3.0	0.0	0.4	0.7	0.6
< 3.5	0.6	3.6	3.3	3.2
< 4.0	6.7	14.4	12.0	11.5
< 4.5	27.4	33.9	28.9	27.7
> 5.0	40.5	43.5	49.7	51.6
> 5.5	15.8	24.5	30.1	32.2
> 6.0	4.7	12.1	16.2	18.1
> 6.5	1.1	5.4	8.1	9.4
> 7.0	0.2	2.2	3.8	4.7
> 7.5	0.0	0.8	1.8	2.4

### Soybeans

(probabilities in percent; prices in U.S. dollars a bushel)

Threshold Prices	Months Forward			
	3	6	9	12
< 5	0.0	0.0	0.1	0.1
< 6	0.0	0.3	0.2	0.5
< 7	0.2	2.0	1.4	2.6
< 8	1.4	7.8	6.4	9.6
< 9	4.9	19.7	18.8	23.9
> 10	84.7	63.5	62.0	56.8
> 11	59.8	45.5	41.2	37.6
> 12	29.5	29.7	24.0	22.3
> 13	11.1	18.0	12.5	12.0
> 14	4.1	10.2	6.0	6.1
> 15	1.7	5.4	2.7	2.9

### Soybean Meal

(probabilities in percent; prices in U.S. dollars a short ton)

Threshold Prices	Months Forward			
	3	6	9	12
< 100	0.0	0.0	0.0	0.0
< 150	0.0	0.0	0.1	0.4
< 200	0.4	0.9	2.1	4.4
< 250	4.5	6.8	11.5	17.4
> 300	82.1	78.0	69.7	62.3
> 350	60.3	56.6	47.6	41.6
> 400	37.8	36.0	28.7	25.2
> 450	20.8	20.6	15.8	14.2
> 500	10.3	10.9	8.2	7.6
> 550	4.7	5.4	4.0	4.0
> 600	2.1	2.6	1.9	2.0

## Options-based Probabilities of Price Changes

(in percent)

**WTI Crude Oil**

Price changes	Months Forward			
	3	6	9	12
-50%	0.1	0.8	1.0	2.8
-30%	2.7	9.1	14.2	16.4
-10%	27.5	36.6	44.6	44.4
+10%	23.4	28.2	27.0	27.9
+30%	3.6	8.7	10.8	11.4
+50%	0.5	2.3	3.8	4.2
+100%	0.0	0.1	0.2	0.3

**Brent Crude Oil**

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.4	1.1	2.0
-30%	0.9	6.2	10.9	14.2
-10%	14.3	29.5	36.8	39.9
+10%	30.6	33.9	33.2	32.9
+30%	3.6	10.9	13.7	14.8
+50%	0.4	2.9	4.9	5.9
+100%	0.0	0.1	0.3	0.5

**U.S. Natural Gas**

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.1	0.9	0.4
-30%	3.2	2.4	7.3	7.1
-10%	31.8	17.1	28.9	32.3
+10%	25.8	48.9	40.3	35.6
+30%	5.8	19.2	17.7	14.5
+50%	1.0	5.8	6.9	5.0
+100%	0.0	0.3	0.7	0.3

**Gasoline**

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	1.7	2.1	0.7
-30%	2.8	18.9	21.9	11.9
-10%	30.5	56.3	57.1	41.1
+10%	21.1	15.0	17.2	29.4
+30%	3.3	3.7	5.7	11.8
+50%	0.4	0.8	1.7	4.1
+100%	0.0	0.0	0.1	0.2

**Copper**

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.0	0.0	0.1
-30%	0.0	1.2	3.6	6.3
-10%	15.2	26.9	33.3	37.9
+10%	12.1	19.2	22.0	23.6
+30%	0.3	2.1	4.0	5.8
+50%	0.0	0.2	0.6	1.1
+100%	0.0	0.0	0.0	0.0

**Gold**

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.0	0.1	0.2
-30%	0.3	1.2	3.5	4.5
-10%	15.2	20.3	27.9	30.4
+10%	12.2	15.4	19.2	20.2
+30%	0.8	1.7	3.2	3.8
+50%	0.0	0.2	0.7	0.9
+100%	0.0	0.0	0.0	0.0

## Options-based Probabilities of Price Changes (concluded)

(in percent)

### Corn

Price changes	Months Forward			
	3	6	9	12
-50%	0.1	0.1	0.6	0.6
-30%	3.6	7.1	12.4	12.0
-10%	29.6	39.0	44.4	43.2
+10%	21.0	25.2	25.4	26.6
+30%	3.6	7.2	9.1	9.8
+50%	0.7	1.6	2.8	3.1
+100%	0.0	0.0	0.1	0.1

### Coffee

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.5	0.9	1.6
-30%	1.4	5.5	8.1	11.0
-10%	26.2	32.5	35.7	39.3
+10%	21.3	24.9	26.6	27.5
+30%	2.5	5.8	7.8	9.6
+50%	0.3	1.4	2.4	3.3
+100%	0.0	0.1	0.2	0.4

### Rough Rice

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.0	0.0	0.1
-30%	0.6	1.7	2.9	3.2
-10%	24.2	25.2	27.7	27.7
+10%	23.2	31.1	32.7	33.1
+30%	2.7	7.2	9.5	9.9
+50%	0.2	1.1	2.1	2.3
+100%	0.0	0.0	0.0	0.1

### Wheat

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.0	0.1	0.1
-30%	0.3	2.5	2.4	2.3
-10%	20.1	28.1	23.7	22.6
+10%	22.3	30.1	36.1	38.2
+30%	2.0	7.5	10.7	12.2
+50%	0.1	1.3	2.5	3.3
+100%	0.0	0.0	0.1	0.2

### Soybeans

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.2	0.2	0.4
-30%	1.8	9.6	8.1	11.8
-10%	26.7	46.1	49.2	53.7
+10%	12.8	19.4	13.8	13.2
+30%	1.4	4.8	2.3	2.5
+50%	0.2	0.9	0.3	0.4
+100%	0.0	0.0	0.0	0.0

### Soybean Meal

Price changes	Months Forward			
	3	6	9	12
-50%	0.5	1.1	2.5	5.2
-30%	13.1	16.9	24.4	31.7
-10%	48.1	51.1	59.8	64.9
+10%	20.9	20.7	15.9	14.3
+30%	6.4	7.1	5.2	5.1
+50%	1.6	2.1	1.6	1.7
+100%	0.0	0.1	0.1	0.1

## Commodity Derivative Contract Specifications

Commodity	Exchange	Contract	Physical Characteristics	Contract Size	Pricing Unit	Months Traded
<b>Brent crude oil</b>	ICE Europe	Futures	Light sweet crude oil	1,000 barrels	U.S. dollars per barrel	Consecutive months up to and including February 2020
		Options		One crude oil futures contract of 1,000 barrels		
<b>WTI crude oil</b>	New York Mercantile Exchange	Futures	Light sweet crude oil	1,000 barrels	U.S. dollars per barrel	Consecutive months are listed for the current year and the next five years; in addition, the Jun and Dec contract months are listed beyond the sixth year.
		Options		One crude oil futures contract of 1,000 barrels		
<b>Natural Gas</b>	New York Mercantile Exchange	Futures	Natural gas delivered at Henry Hub, LA	10,000 MMBtu	U.S. dollars per MMBtu	Consecutive months for the current year plus the next twelve full calendar years.
		Options		One natural gas futures contract of 10,000 MMBtu		
<b>Gasoline</b>	New York Mercantile Exchange	Futures	New York Harbor RBOB	42,000 gallons	U.S. cents per gallon	Consecutive months for 36 months
		Options		One gasoline futures contract of 42,000 gallons		
<b>Gold</b>	Chicago Mercantile Exchange	Futures	Gold (a minimum of 995 fineness)	100 troy ounces	U.S. dollars per troy ounce	Current calendar month; the next two calendar months; any Feb, Apr, Aug, and Oct falling within a 23-month period; and any Jun and Dec falling within a 72-month period beginning with the current month.
		Options		One COMEX Gold futures contract		
<b>Corn</b>	Chicago Mercantile Exchange	Futures	Yellow corn grade #2	5,000 bushels (127 MT)	U.S. cents per bushel	Mar, May, Jul, Sep, Dec. The monthly option contract exercises into the nearby futures contract.
		Options		One corn futures contract (of a specified month) of 5,000 bushels		
<b>Coffee</b>	ICE	Futures	Arabica coffee from 19 countries of origin	37,500 lbs	U.S. cents per pound	Mar, May, Jul, Sep, Dec. The monthly option contract exercises into the nearby futures contract.
		Options		One coffee futures contract (of a specified month) of 37,500 lbs		
<b>Rough rice</b>	Chicago Mercantile Exchange	Futures	U.S. #2 long grain rough rice with a total milling yield of 65%+	2,000 hundredweights (CWT)	U.S. cents per hundredweight	Jan, Mar, May, Jul, Sep, Nov. The monthly option contract exercises into the nearby futures contract.
		Options		One rough rice futures contract of 2,000 hundredweights (CWT)		
<b>Wheat</b>	Chicago Mercantile Exchange	Futures	#2 soft red winter wheat	5,000 bushels (136 MT)	U.S. cents per bushel	Mar, May, July, Sep, Dec. The monthly option contract exercises into the nearby futures contract.
		Options		One Wheat futures contract (of a specified month) of 5,000 bushels		
<b>Soybean meal</b>	Chicago Mercantile Exchange	Futures	Meal with minimum protein of 48%	100 short tons	U.S. dollars per ton	Jan, Mar, May, Jul, Aug, Sep, Oct, Dec. The monthly option contract exercises into the nearby futures contract.
		Options		One soybean meal futures contract (of a specified month) of 100 short tons		
<b>Soybeans</b>	Chicago Mercantile Exchange	Futures	Yellow soybean grade #2	5,000 bushels (136 MT)	U.S. cents per bushel	Jan, Mar, May, Jul, Aug, Sep, Nov. The monthly option contract exercises into the nearby futures contract.
		Options		One soybean futures contract (of a specified month) of 5,000 bushels		

Sources: Chicago Board of Trade, ICE, Bloomberg, L.P.



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