

Commodity Price Outlook & Risks

Research Department, Commodities Unit



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www.imf.org/commodities

commodities@imf.org

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

Outlook. On September 28, the Organization of Petroleum Exporting Countries (OPEC) agreed to reduce crude oil output to between 32.5-33 million barrels per day; in response to this agreement, spot oil prices increased by about \$2.5/bbl. Futures markets show prices modestly increasing over the next year; nonetheless, there is substantial uncertainty about its outlook. Risks include geopolitical tensions in the Middle East, high inventory levels and a rapid response from U.S. shale producers. Gasoline prices are expected to slightly decline in the colder months and rise throughout the next summer, while U.S. natural gas prices are projected to rise in the coming winter and decline thereafter, both following seasonal patterns. Copper prices are expected to slightly decline and remain flat in the near future, with its stocks in LME rising to a one year high. Gold prices are expected to remain broadly unchanged. The outlook for agricultural commodity prices continues to be mixed over the next twelve months, with rice, wheat, corn and coffee prices increasing, but soybean and soybean meal prices remaining broadly unchanged.

Risks. The likelihood of per-barrel prices for WTI falling below \$30 in the next 12 months decreased to 3 percent from 10 percent, and the likelihood of Brent falling below \$30 also decreased 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 high level.

The likelihood of per-MMBtu U.S. natural gas prices below \$2 (12 months forward) decreased to 7 percent from 10 percent, while the probability of prices rising above \$4 increased to 11 percent from 6 percent, suggesting an ascending shift in the balance of risks.

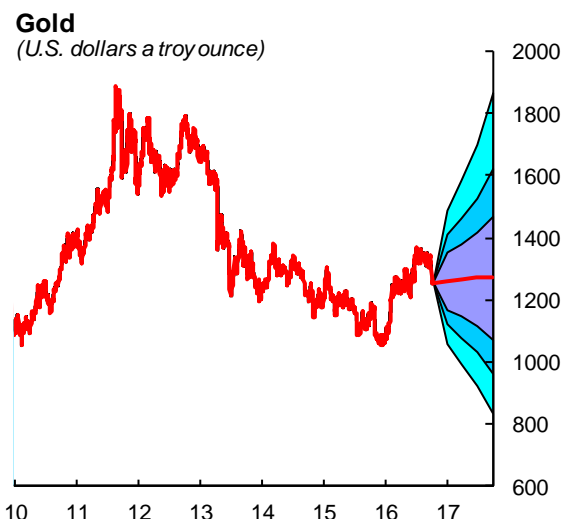
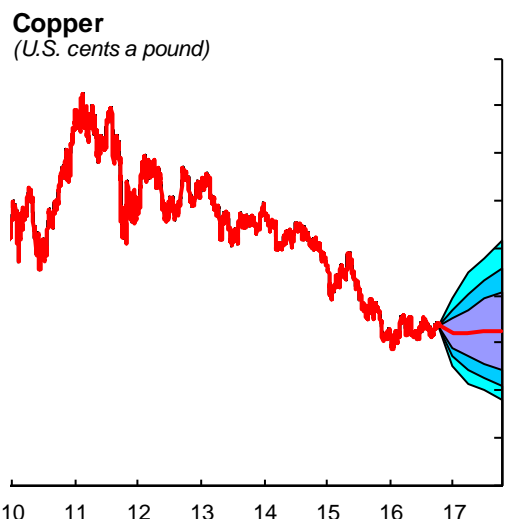
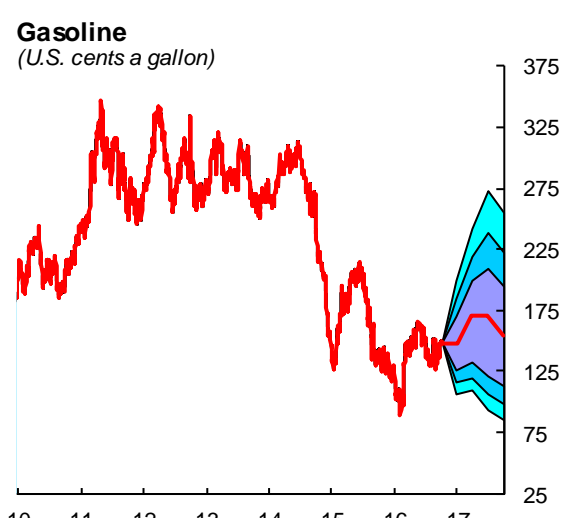
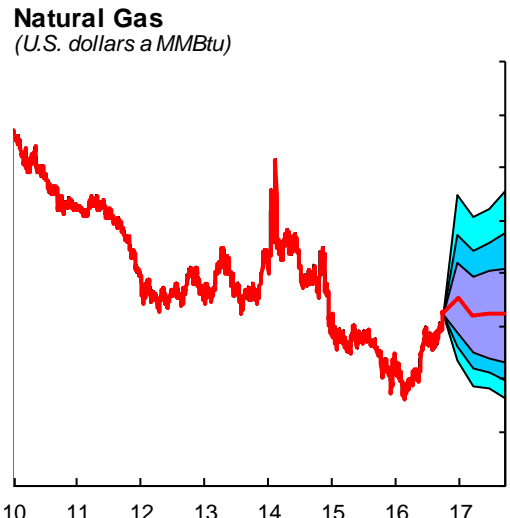
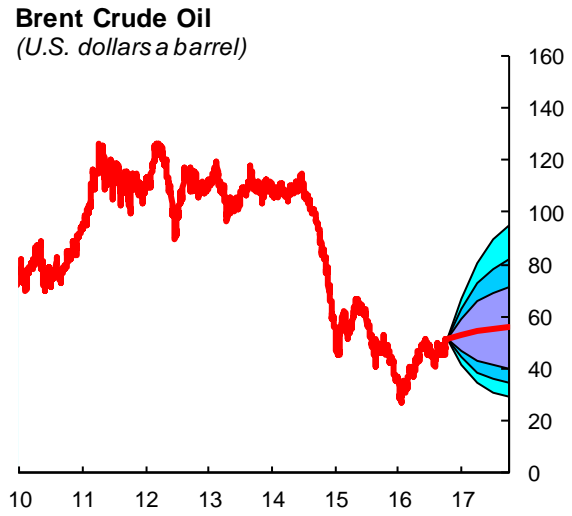
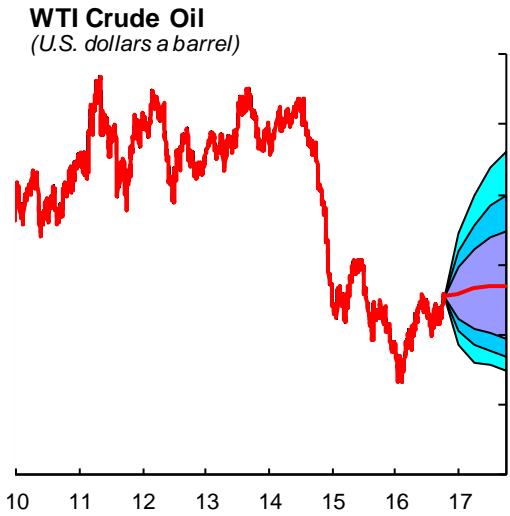
For metals, the risk of copper prices falling below \$1.5 a pound decreased from 6 percent to 4 percent, and the probability of prices increasing above \$2.5 a pound increased from 12 percent to 17 percent, in light of China's demand growth. The probability of gold prices falling below \$900 a troy ounce increased to 5 percent, while the probability of an increase beyond \$1500 decreased to 9 percent from 13 percent last month.

The likelihood of per bushel corn prices below \$2.5 slightly decreased to 9 percent from 10 percent in September. The likelihood of soybean meal prices rising above \$450 a short ton remained broadly unchanged at 2 percent. Meanwhile, the likelihood of per-bushel soybean prices below \$7 decreased to 14 percent from 16 percent, and the probability of an increase above \$13 marginally increased to 5 percent from 4 percent.

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 October 11, 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).

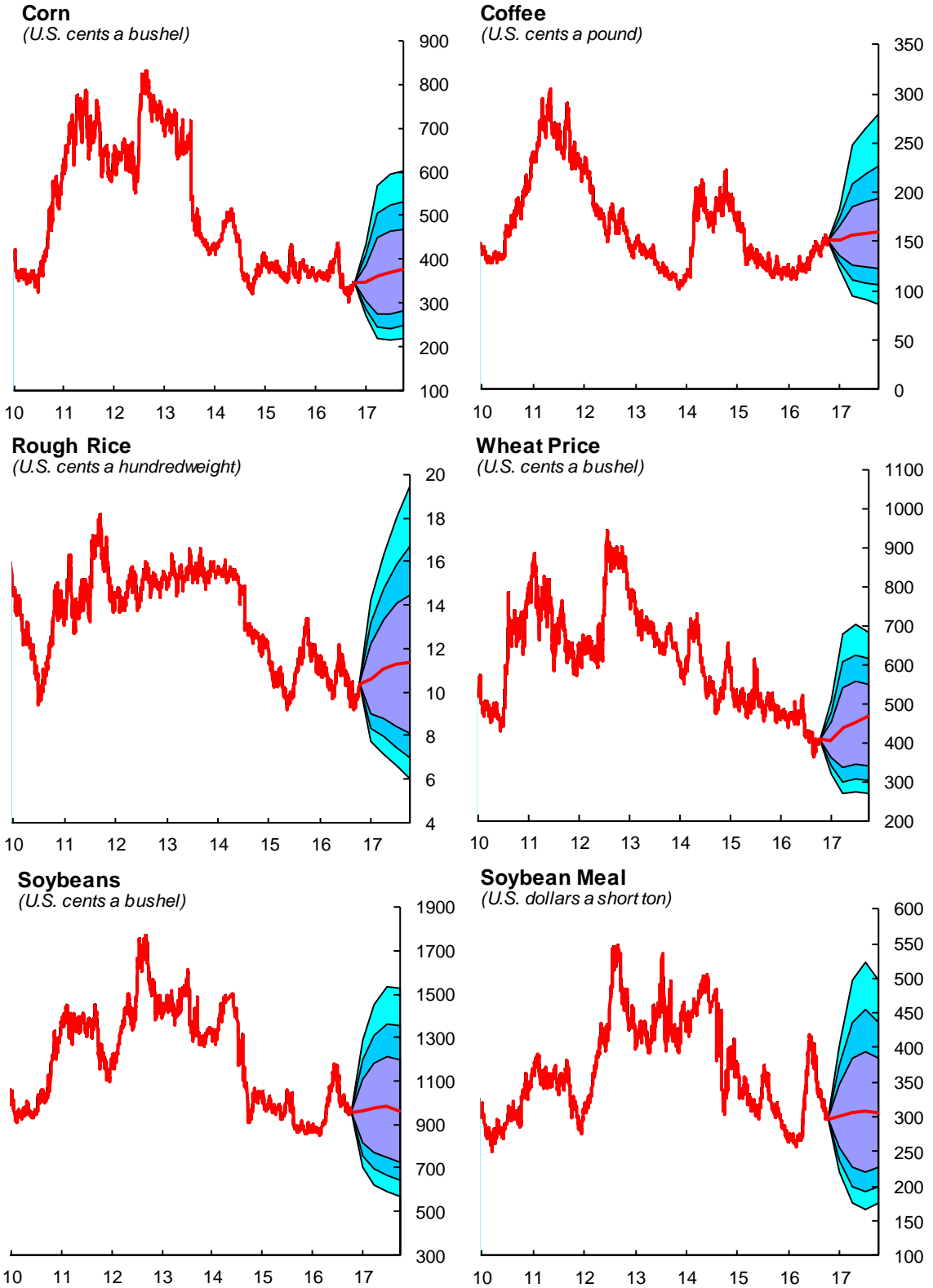
Selected Commodities—Market Price Outlook and Risks

▬ 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	0.0	0.0	0.0
< 25	0.0	0.2	0.2	0.4
< 30	0.2	1.5	1.7	2.9
< 35	1.4	5.5	7.3	9.9
< 40	6.5	14.5	18.9	22.4
< 45	21.8	30.3	35.3	38.5
> 50	51.6	49.7	47.0	45.0
> 55	25.6	30.9	31.5	30.8
> 60	9.9	16.9	19.6	19.8
> 65	3.3	8.5	11.5	12.2
> 70	1.1	4.0	6.4	7.2

Brent Crude Oil

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

Threshold Prices	Months Forward			
	3	6	9	12
< 20	0.0	0.0	0.0	0.1
< 25	0.0	0.1	0.3	0.6
< 30	0.1	0.7	1.8	2.8
< 35	0.6	3.4	6.4	8.6
< 40	2.1	10.9	16.0	19.3
< 45	10.3	25.1	30.7	33.9
> 50	64.1	55.7	52.2	50.1
> 55	30.6	36.2	35.9	35.4
> 60	9.9	20.8	22.9	23.5
> 65	2.5	10.7	13.7	14.9
> 70	0.7	5.1	7.8	9.0

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	0.0	0.0
< 1.50	0.0	0.3	0.2	0.7
< 2.00	0.6	3.4	4.4	6.7
< 2.50	5.6	18.0	22.0	25.6
< 3.00	27.6	48.2	50.7	52.9
> 3.50	37.5	23.5	24.3	24.0
> 4.00	13.8	8.4	10.0	10.5
> 4.50	4.5	2.7	3.6	4.3
> 5.00	1.6	0.9	1.3	1.7
> 5.50	0.6	0.3	0.4	0.7
> 6.00	0.3	0.1	0.1	0.3

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	0.0	0.3	0.6
< 1.00	1.0	1.1	5.4	8.1
< 1.25	17.9	13.1	24.7	31.5
> 1.50	37.9	56.3	47.3	38.9
> 1.75	8.8	25.6	24.0	17.6
> 2.00	1.3	8.7	10.4	6.8
> 2.25	0.2	2.4	4.0	2.4
> 2.50	0.0	0.6	1.5	0.8
> 2.75	0.0	0.1	0.5	0.3

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	0.0
< 1.25	0.0	0.0	0.1	0.4
< 1.50	0.2	0.9	2.1	4.2
< 1.75	2.3	6.7	12.5	17.0
< 2.00	16.2	28.4	36.4	39.8
> 2.25	29.7	34.6	35.1	35.2
> 2.50	4.0	10.4	14.9	16.9
> 2.75	0.8	2.6	5.1	7.0
> 3.00	0.1	0.7	1.6	2.6
> 3.25	0.0	0.2	0.4	0.9

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	0.1	0.5
< 800	0.0	0.1	0.6	1.8
< 900	0.1	0.7	2.1	4.7
< 1000	1.0	3.1	5.9	10.8
< 1100	5.7	10.5	16.3	23.7
< 1200	28.3	33.9	38.9	44.1
> 1300	28.0	31.0	33.4	33.9
> 1400	6.3	10.1	14.4	17.8
> 1500	1.6	3.4	5.8	8.8
> 1600	0.4	1.3	2.5	4.4
> 1700	0.1	0.5	1.3	2.4

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	1.0	1.3	1.0
< 2.5	0.5	9.5	10.4	8.9
< 3.0	15.5	31.5	31.7	28.9
> 3.5	38.6	41.3	42.6	45.4
> 4.0	7.8	20.4	22.3	24.3
> 4.5	0.8	8.6	10.2	11.3
> 5.0	0.0	3.3	4.3	4.8
> 5.5	0.0	1.1	1.7	1.9
> 6.0	0.0	0.4	0.6	0.7
> 6.5	0.0	0.1	0.2	0.2
> 7.0	0.0	0.0	0.1	0.1

Coffee

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

Threshold Prices	Months Forward			
	3	6	9	12
< 0.6	0.0	0.0	0.1	0.1
< 0.8	0.0	0.7	0.9	1.1
< 1.0	0.0	3.4	4.3	5.1
< 1.2	1.5	13.3	15.3	16.7
> 1.4	72.8	61.3	60.1	59.3
> 1.6	22.7	31.1	32.1	32.7
> 1.8	2.6	12.2	13.8	14.8
> 2.0	0.1	4.5	5.6	6.4
> 2.2	0.0	1.8	2.4	2.9
> 2.4	0.0	0.8	1.2	1.5
> 2.6	0.0	0.4	0.6	0.8

Rough Rice

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

Threshold Prices	Months Forward			
	3	6	9	12
< 0.05	0.0	0.0	0.1	0.4
< 0.06	0.0	0.2	1.0	2.1
< 0.07	0.5	2.2	4.8	7.6
< 0.08	4.7	9.2	14.1	18.3
< 0.09	18.9	23.4	28.7	33.1
> 0.10	56.8	57.2	54.0	50.7
> 0.11	31.8	37.8	37.6	35.7
> 0.12	14.5	22.4	24.3	23.7
> 0.13	5.5	12.1	14.7	15.0
> 0.14	1.8	6.0	8.5	9.2
> 0.15	0.5	2.8	4.7	5.4

Wheat

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

Threshold Prices	Months Forward			
	3	6	9	12
< 2.5	0.0	1.3	1.2	1.4
< 3.0	0.7	8.4	7.6	8.3
< 3.5	13.0	25.6	23.4	24.6
< 4.0	51.6	48.5	45.4	46.5
< 4.5	85.8	69.5	66.5	67.2
> 5.0	2.3	15.8	18.2	17.8
> 5.5	0.2	7.4	8.9	8.8
> 6.0	0.0	3.2	4.1	4.1
> 6.5	0.0	1.3	1.7	1.8
> 7.0	0.0	0.5	0.7	0.7
> 7.5	0.0	0.2	0.3	0.3

Soybeans

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

Threshold Prices	Months Forward			
	3	6	9	12
< 5	0.0	0.1	0.3	0.5
< 6	0.2	1.7	2.9	4.0
< 7	2.8	8.8	11.6	14.3
< 8	15.7	24.8	28.0	31.8
< 9	41.5	46.5	48.3	52.0
> 10	31.0	32.9	33.0	30.2
> 11	12.8	17.8	19.0	17.4
> 12	4.3	8.7	10.1	9.3
> 13	1.2	3.9	5.0	4.7
> 14	0.3	1.6	2.4	2.2
> 15	0.1	0.6	1.1	1.0

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	0.4	0.7	0.4
< 200	0.6	7.4	9.7	7.6
< 250	14.9	31.1	33.7	31.4
> 300	42.6	38.9	38.2	38.6
> 350	10.9	17.3	18.0	17.1
> 400	1.7	6.6	7.5	6.5
> 450	0.2	2.2	2.8	2.2
> 500	0.0	0.7	1.0	0.7
> 550	0.0	0.2	0.3	0.2
> 600	0.0	0.1	0.1	0.1

Options-based Probabilities of Price Changes (in percent)

WTI Crude Oil

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.3	0.2	0.5
-30%	1.7	6.2	8.3	11.0
-10%	25.0	33.0	37.8	40.9
+10%	22.0	28.0	29.1	28.6
+30%	2.6	7.3	10.2	11.0
+50%	0.3	1.6	3.0	3.6
+100%	0.0	0.0	0.1	0.2

Brent Crude Oil

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.1	0.4	0.7
-30%	0.7	4.2	7.5	9.9
-10%	13.8	28.6	34.0	37.1
+10%	23.9	31.9	32.3	32.1
+30%	1.7	8.7	11.6	12.9
+50%	0.2	1.8	3.4	4.4
+100%	0.0	0.0	0.1	0.2

U.S. Natural Gas

Price changes	Months Forward			
	3	6	9	12
-50%	0.1	0.6	0.6	1.4
-30%	2.1	9.0	11.7	15.0
-10%	22.2	42.4	45.6	48.2
+10%	33.7	20.9	22.0	21.9
+30%	8.7	5.3	6.6	7.3
+50%	2.2	1.2	1.7	2.2
+100%	0.1	0.0	0.1	0.1

Gasoline

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.0	0.2	0.5
-30%	1.8	1.8	7.3	10.6
-10%	31.4	21.8	33.9	41.7
+10%	18.9	38.8	33.9	26.3
+30%	2.3	12.1	13.4	9.1
+50%	0.2	2.7	4.5	2.7
+100%	0.0	0.0	0.2	0.1

Copper

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.0	0.0	0.0
-30%	0.2	1.2	2.7	5.1
-10%	12.3	24.2	32.6	36.5
+10%	8.6	17.1	21.2	22.8
+30%	0.4	1.5	3.4	4.9
+50%	0.0	0.1	0.4	0.8
+100%	0.0	0.0	0.0	0.0

Gold

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.0	0.0	0.1
-30%	0.0	0.5	1.7	3.9
-10%	9.1	15.0	21.4	28.8
+10%	8.8	13.1	17.6	20.7
+30%	0.3	1.0	2.1	3.7
+50%	0.0	0.1	0.4	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%	0.0	0.1	0.2	0.2
-30%	0.2	7.2	8.0	6.8
-10%	23.7	37.5	37.3	34.4
+10%	16.3	27.6	29.4	31.8
+30%	0.8	8.8	10.4	11.5
+50%	0.0	2.3	3.0	3.4
+100%	0.0	0.0	0.1	0.1

Coffee

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.4	0.5	0.7
-30%	0.0	5.0	6.2	7.2
-10%	17.8	32.1	33.7	34.8
+10%	13.2	24.1	25.5	26.3
+30%	0.2	5.5	6.7	7.5
+50%	0.0	1.4	1.9	2.3
+100%	0.0	0.1	0.2	0.2

Rough Rice

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.0	0.2	0.5
-30%	1.0	3.4	6.8	10.0
-10%	26.8	30.0	34.8	38.9
+10%	23.2	30.5	31.3	30.1
+30%	3.2	8.5	11.2	11.7
+50%	0.2	1.7	3.3	3.9
+100%	0.0	0.0	0.1	0.2

Wheat

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.1	0.1	0.1
-30%	0.2	5.4	4.8	5.3
-10%	23.4	32.9	30.3	31.5
+10%	15.1	31.2	34.3	33.5
+30%	0.6	10.3	12.1	11.9
+50%	0.0	2.7	3.4	3.4
+100%	0.0	0.1	0.1	0.1

Soybeans

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.1	0.2	0.3
-30%	1.3	5.6	7.9	10.1
-10%	29.7	37.2	39.8	43.7
+10%	20.6	24.6	25.4	23.2
+30%	2.6	6.3	7.7	7.0
+50%	0.2	1.2	1.9	1.8
+100%	0.0	0.0	0.0	0.0

Soybean Meal

Price changes	Months Forward			
	3	6	9	12
-50%	0.0	0.3	0.7	0.4
-30%	1.2	10.2	12.7	10.4
-10%	28.3	42.1	44.2	42.4
+10%	21.8	25.6	25.9	25.3
+30%	2.9	8.6	9.5	8.5
+50%	0.2	2.4	3.0	2.4
+100%	0.0	0.1	0.1	0.1

Commodity Derivative Contract Specifications

Commodity	Exchange	Contract	Physical Characteristics	Contract Size	Pricing Unit	Months Traded
Brent crude oil	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		
WTI crude oil	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		
Natural Gas	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		
Gasoline	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		
Gold	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		
Corn	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		
Coffee	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		
Rough rice	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)		
Wheat	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		
Soybean meal	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		
Soybeans	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.



INTERNATIONAL MONETARY FUND

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