Futures and Forwards

History and Descriptions

Forwards vs Futures

- A forward contract is an agreement to trade at a later date at a forward price that is fixed when the contract starts. Basically, a forward freezes a price for a future transaction.
 - a forward trades in an over-the-counter (OTC) market, which is an unregulated, diffused network of scattered sellers and buyers who are linked by telephones, telexes, and increasingly by computers.
- Futures Contract: A legally binding agreement to buy or sell a commodity or financial instrument at a later date. Futures contracts are standardized according to the quality, quantity and delivery time and location for each commodity.
 - A futures trades in an exchange, which is an organized, regulated marketplace where buyers and sellers gather to trade some homogeneous product.

History in Brief

TABLE 4-2THE EARLY HISTORY OF TRADING FORWARD CONTRACTS

Development

2000 B.C. onward Forward contracts traded in India, Greece, the Roman Empire and

elsewhere.

11th / 12th century *Medieval fairs*.

A.D. onward

1570 Commodity Exchange in London, England.

1630s Rice Exchange in Osaka, Japan.

Brief History in The USA

TABLE 4-3 TURES EXCHANGES AND THE EVOLUTION

DEVELOPMENT OF U.S. FUTURES EXCHANGES AND THE EVOLUTION OF TODAY'S FUTURES CONTRACT (1848-1925)

Year	Development
1848	Chicago Board of Trade (CBOT) was established to standardize grains trading.
1849-50 1865	"To arrive" contracts started trading at the CBOT. General Rules were developed at CBOT that standardized futures contracts. Traders were required to post margins.
1877	Speculators were allowed to trade at the CBOT.
1874	Chicago Produce Exchange was formed to trade farm products. Eventually, in 1919 it became the <i>Chicago Mercantile Exchange (CME or the Merc)</i> with its own clearinghouse.
1882	New York Mercantile Exchange (NYM) was established.
1925	Clearinghouse was established at CBOT.

TABLE 4-4 SOME MILESTONES IN THE HISTORY OF FUTURES TRADING IN RECENT YEARS (1970-TILL DATE)

Year	Development
1972	The first financial futures, foreign currency futures, started trading at the newly created International Monetary Market (IMM) at the Merc.
1973	Chicago Board Options Exchange (CBOE) was founded by members of the CBOT.
1973	The <i>Black-Scholes and Merton model</i> was developed for pricing European options. A modified version of this model has been used to price options on futures.
1974	U.S. Congress passed the Commodity Futures Trading Commission Act that created the CFTC as the "federal regulatory agency for futures trading."
1975	The <i>first interest rate futures</i> , GNMA futures contract, started trading at the CBOT. Treasury bond futures that began trading in 1977 at the CBOT, eventually caused its demise.
1981	The <i>first cash-settled contract</i> , Eurodollar futures, started trading at the Merc. In 1994, it displaced the T-bond futures as the world's most actively traded futures contract.
1982	The <i>National Futures Association (NFA)</i> , a self-regulatory organization made up of firms and people who work in futures industry, was established.
1982	Options on U.S. Treasury bond futures started trading at the CBOT.
1982	The <i>first index futures contract</i> , the Value Line Index futures, started trading at the Kansas City Board of Trade. Within months, the Standard & Poor's 500 stock index futures started trading at the Merc.
1984	The <i>first international futures link</i> , CME/SIMEX mutual offset trading link, was established.
1992	A post market global electronic transaction system GLOBEX was launched by the Merc and the Reuters. Its successor, GLOBEX2, was introduced in 1998.

Recent Milestones

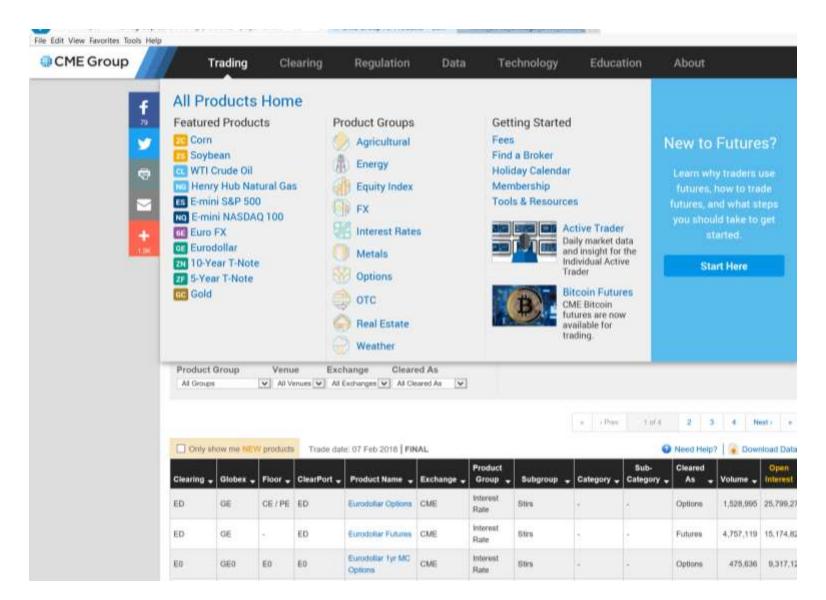
What is a Commodity?

- Originally viewed as a physical for delivery
- The CFTC Act of 1974 (See U.S. Code, freely available on the internet) however expanded the definition of a commodity to include pretty much any "goods and articles...and all services, rights, and interests" on which contracts for future delivery can be written.",
 - "the term "commodity" means wheat, cotton, rice, corn, ... livestock, livestock products, and frozen concentrated orange juice, and all other goods and articles, except onions
 - onion futures were prone to manipulation, and so in late 1950s, onion farmers lobbied and had the legislation passed that banned onion trading. Section 13-1 of Title 7, Chapter 1 warns "any person who shall violate the provisions of this section (i.e., trade onion futures) shall be deemed guilty of a misdemeanor and upon conviction thereof be fined not more than \$5,000.

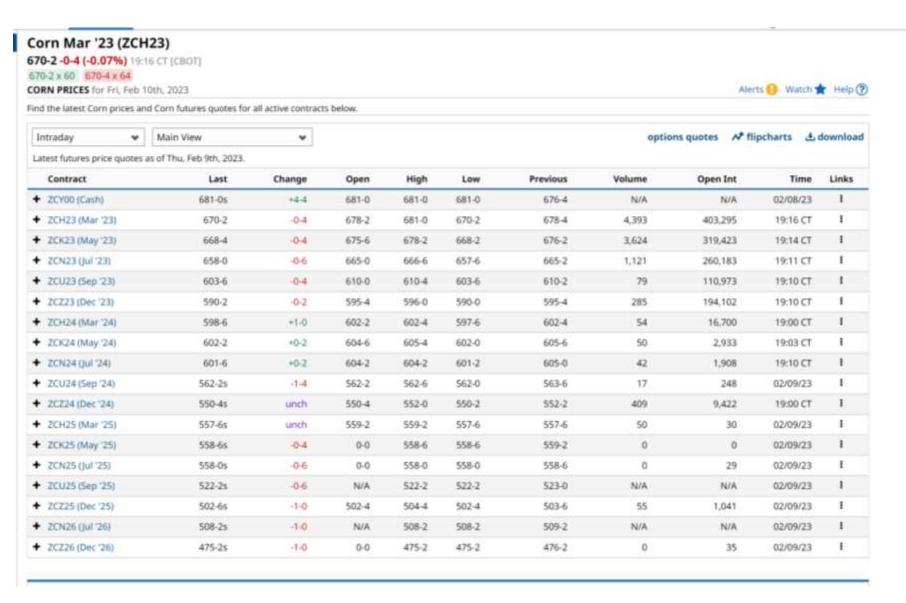
Settlement of Contracts

- Traders in futures contracts have accounts 'Marked to Market' on a daily basis
- Price gains are credited and losses are debited
- Zero-sum game on round-turn (long and short) transaction-one part wins and one part loses in equal amounts.
 - Margin account must be opened by all traders to cover losses
 - E.g. \$5,000/contract which earns interest
- A position is closed by taking an equal and opposite position in same contract with gains transferred to financial institution or margin account held for clearing by 'Clearing House'
 - Even if original counterparty is not part of closeout trade the clearinghouse plays the role of that party and clears the account.
- As closeout occurs (long to short; short to long) volume increases and open interest falls so number of contracts outstanding decreases (essentially an order is canceled)

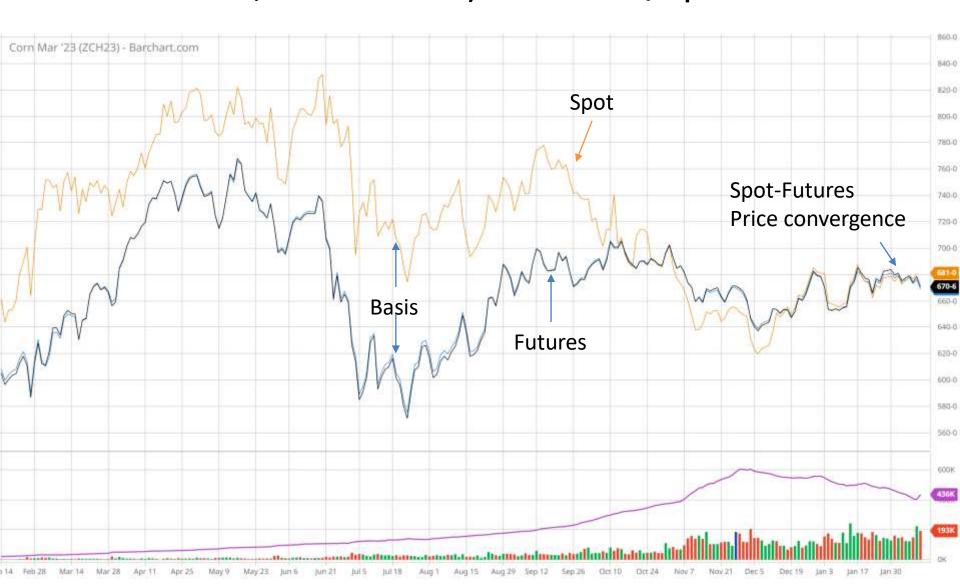
Chicago Mercantile Exchange



Open Corn Futures Contracts, 2023-2036



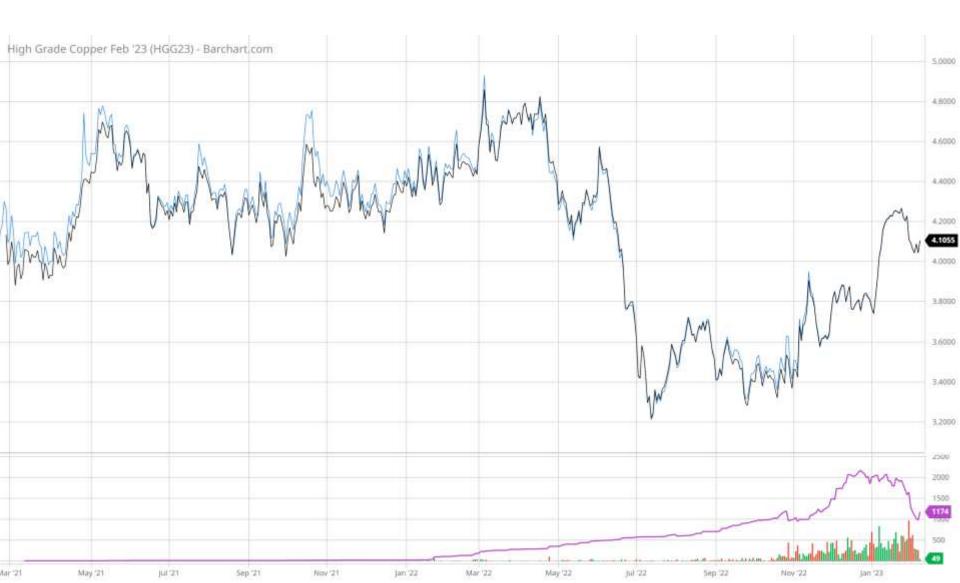
March, May 2023 CME Corn Futures (5,000 bushels, deliverable) and Cash/Spot Price



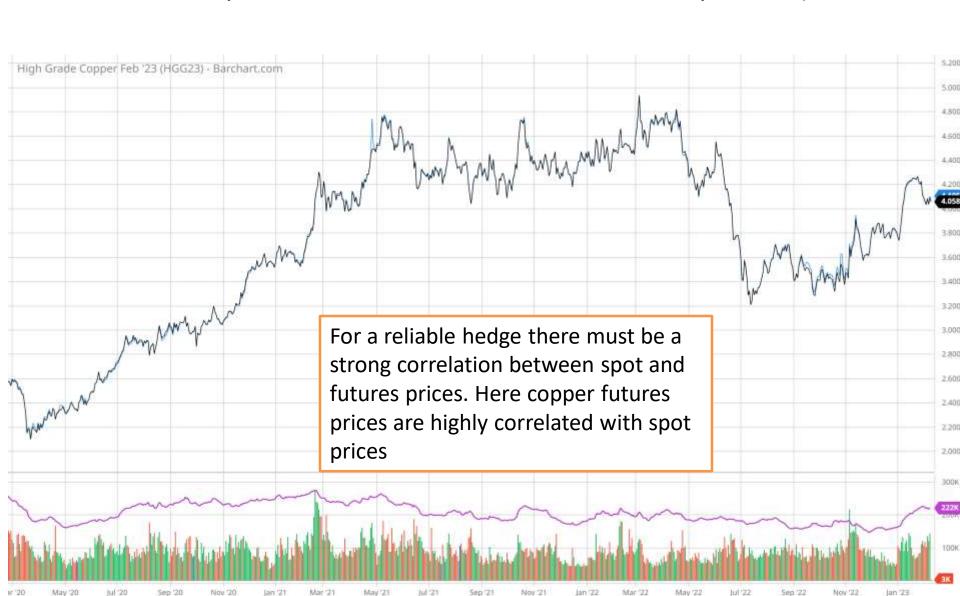
Open Corn Futures Contracts, 2023-2026



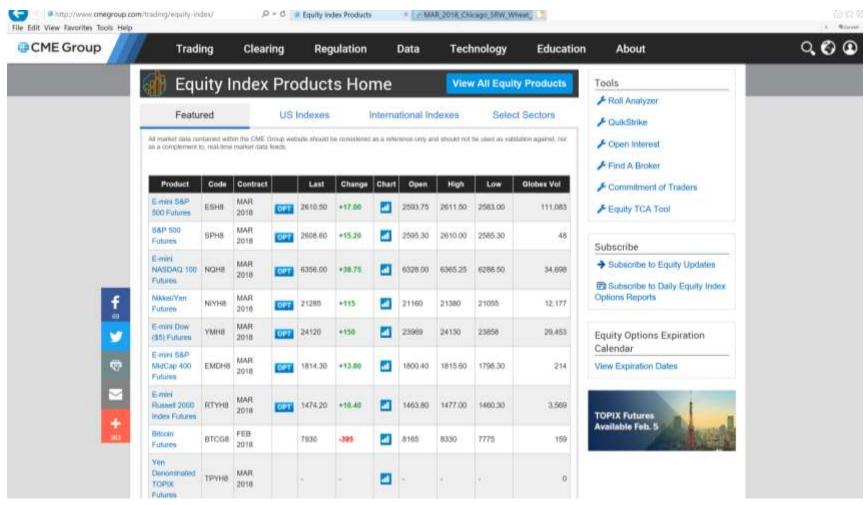
Feb 2023 High Grade Copper Futures Contracts (25,000 lbs deliverable) and Spot Price (\$/lbs)



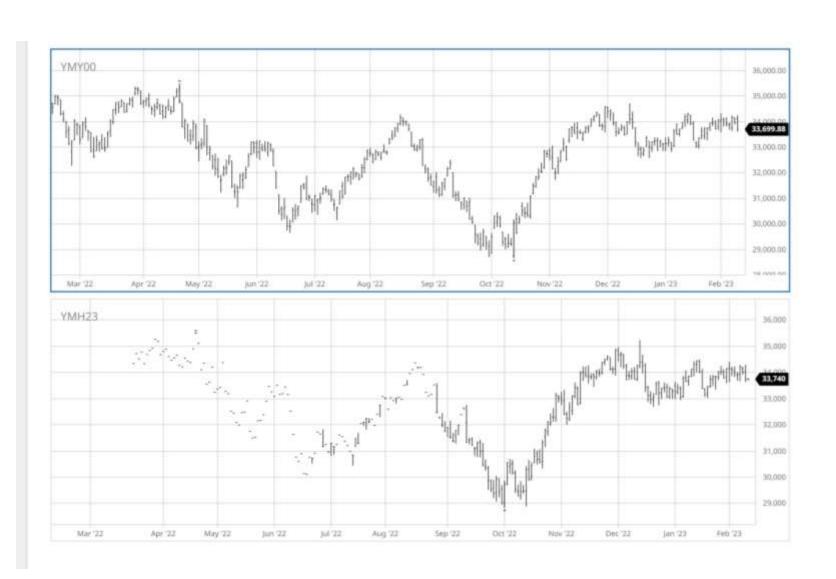
High Grade Copper Futures Contracts, cash and nearby (\$/lbs, futures prices roll over to next contract at expiration)



CME Group Today: Equity Index Equity Index Products - CME Group



DOW Index (top) and March 2023, Mini-DOW (*\$5 cash settled) Futures



Hard Red Winter Wheat Futures, 2022

OVERVIEW QUOTES SETTLEMENTS VOLUME & OI TIME & SALES SPECS MARGINS CALENDAR FUTURES OPTIONS -

MONTH	OPTIONS	CHART	LAST	CHANGE	PRIOR SETTLE	OPEN		LOW	AOTAWE	UPDATED
MAR 2022 ZWH2	OPT	at	765'2	+13'4 (+1.88%)	751'6	754'6	767*2	748`2	47,214	16:38:31 CT 84 Feb 2022
MAY 2822 ZBK2	OFT	all	771 '2	+13'8 (+1.71%)	758'2	761'8	773*4	755'2	27,627	16:37:42 CT 84 Feb 2822
JUL 2022 ZWN2	CPT	all	764'0	+11'6 (+1.56%)	752 2	757'2	766'8	75812	11,956	16:38:24 CT 84 Feb 2822
SEP 2022 ZWU2	67	all	763 4	+10'0 (+1.33%)	753'4	757'0	766 6	752'0	2,688	16:39:14 CT 84 Feb 2822
DEC 2022 ZWZ2	GPT	al	769'0	+10'6 (+1.42%)	758'2	76116	771*4	757.0	2,336	16:38:18 CT 84 Feb 2822
MAR 2023 ZMH3	C/T	at	771 4	+B'4 (+1,11%)	763 e	766'4	775 8	76116	254	16:39:28 CT 84 Feb 2822
MAY 2023 ZHK3	Ger I	at	770'4	+11'4 (+1.52%)	759'e	764' 0	770'4	759'2	85	16:39:19 CT 84 Feb 2822
JUL 2023 ZWN3	CPT	at	743 ' 4	+7 4 (+1.82%)	736'8	736'8	744'8	736'0	78	16:39:16 CT 84 Feb 2822
SEP 2823 ZMU3	CPT	al	74812	+4'2 (+0.58%)	736'8	739'8	74012	739'0	12	16:39:18 CT 84 Feb 2822
DEC 2023 ZWZ3	Ger 1	at	749'8	+9°2 (+1.25%)	739 6	739' û	749'8	73918	28	16:37:47 CT 84 Feb 2022
MAR 2024	500	at			739'6				0:	16:39:31 CT

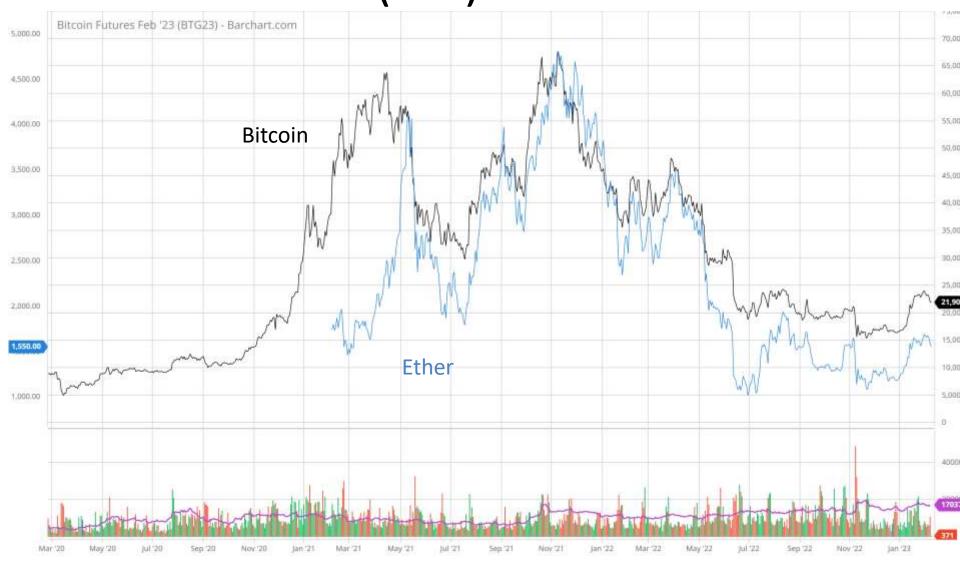
March 2022 Wheat Futures



2022 Silver Futures Contracts

FUTURES OPTIONS -OVERVIEW QUOTES SETTLEMENTS VOLUME & OI TIME & SALES SPECS MARGINS CALENDAR SETTLE FEB 2022 12:30:31 CT OPT .11 22.485 +0.118 (+8.49%) 22.375 22.530 22.530 22.480 42 SIG2 86 Feb 2822 MAR 2822 12:30:31 CT OPT ul 22.528 +8.145 (+8.65%) 22.375 22.698 45,473 22,428 22,188 SIH2 86 Feb 2022 APR 2022 12:30:31 CT site OPT itt 22.585 +8.188 (+8.48%) 22,397 22.465 22.640 22,158 39 06 Feb 2022 MAY 2822 12:30:31 CT OPT all 22.558 +8.133 (+8.59%) 22.417 22.468 22.725 22.148 3,586 STK2 86 Feb 2822 JUL 2022 12:30:31 CT itt 22.568 +0.096 (+0.43%) 22.464 22.550 22.770 22.200 OPT 1,147 SIN2 86 Feb 2822 SEP 2022 12:38:31 CT OPT ul 22.635 +0.121 (+0.54%) 22.514 22.635 22.665 22.525 464 SIU2 86 Feb 2822 DEC 2822 12:38:31 CT 22.375 278 OPT 111 22.738 +0.116 (+0.51%) 22.614 22.798 22.790 06 Feb 2022 JAN 2023 12:30:31 CT 8 011 att 22.643 STF3 86 Feb 2822 MAR 2823 12:30:31 CT OPT ul 22.789 78 SING 86 Feb 2822 MAY 2823 12:30:31 CT 22.765 8 OPT 111 SIK3 06 Feb 2022 JUL 2023 12:38:31 CT oth 22,811

February 2023, BitCoin (right) and Etherium (left) Futures Prices



CME Group Today: Weather Futures

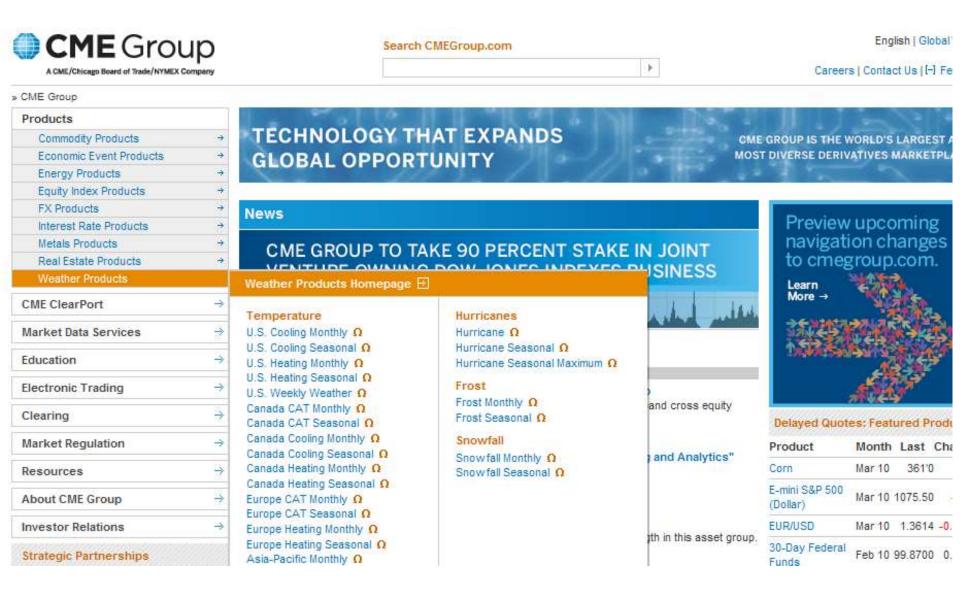


TABLE 4-1COMPARISON OF FUTURES AND FORWARD CONTRACTS

	FUTURES	FORWARD
1)	A futures is regulated.	A forward is largely unregulated.
2)	A futures trades in an organized	A forward trades in over-the-counter
	exchange.	(OTC) market.
3)	A futures is standardized.	A forward is customized.
4)	A futures contract is usually liquid and	A forward contract is illiquid and has
	has a secondary market.	virtually no secondary market.
5)	A futures is guaranteed by a	A forward enjoys no such guarantee and
	clearinghouse and has no credit	has credit risks.
	(counterparty) risk.	
6)	A futures allows trading among	Forward traders know each other and
	strangers; individual's creditworthiness is	usually have high credit rating or require
	irrelevant.	collateral.
7)	A futures requires margins (security	A forward has no margin requirements.
	deposits).	
8)	A futures is settled daily.	A forward is settled at maturity.
9)	A futures is usually closed out before	A forward usually ends in delivery or cash
	maturity.	settlement.
10)	A futures has a range of delivery dates.	A forward usually has a single delivery
		date.

Types of Forward Contracts in Agriculture

- Production Contracts
 - Farmer delivers harvest from fixed # of acres regardless of yield .. Prices established at time of delivery
- Deferred Delivery Contract
 - Fixed price contract, in advance, for specified quality and fixed/variable quantity over a range of postharvest dates (closest to forward contracts as presented in book)
- Basis Contract
 - Basis = Spot price-futures (usually negative)
 - Farmers and elevator agree on 'fixed basis' ahead of delivery
 - Price received is futures price + fixed basis
 - Willingness to accept market risk but lock in local risk
- Deferred Pricing Contract
 - Grower delivers crop to warehouse/elevator/processor puts into storage and has option to price over some time period (e.g. 90-days)
 - Price can rise or fall over that time period
 - Similar to warehouse receipts
- Grain Pricing Order/Target Price Contract
 - Has option to accept minimum price or higher price if price increases above target
 - Like an American Option
 - Risk-protected warehouse receipts

Uses of Futures and Forwards

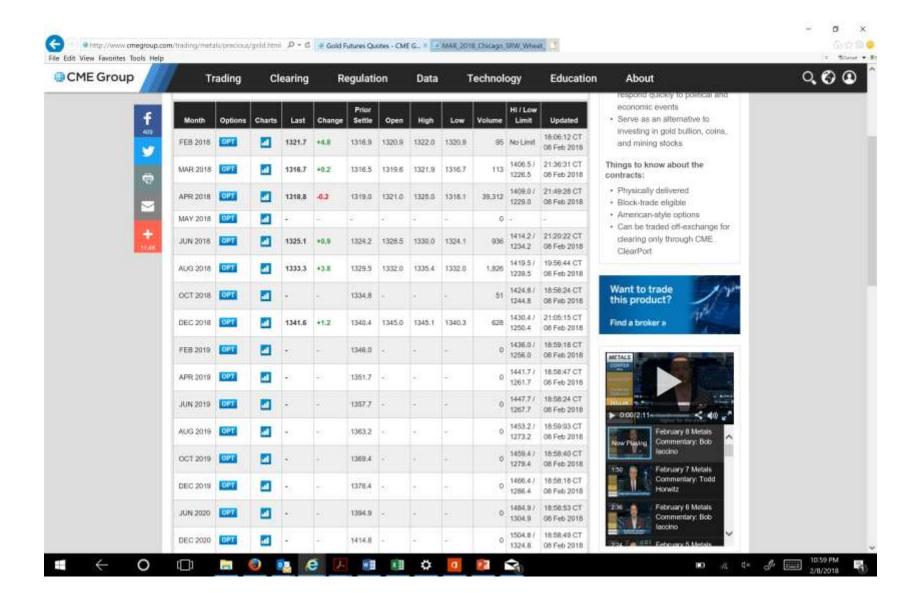
- a) Forwards are useful for acquiring a commodity at a fixed price at a later date. Futures are seldom used for trading assets; their features however make them excellent tools for risk management purposes.
- b) Forwards and futures and other derivatives help make a market more "complete." In a complete market securities trade that help investors attain all kinds of future payoffs
- c) They offer all kinds of risk management tools to investors and allow them to tailor risk-return tradeoffs.
- d) They help people speculate. Adding volume and making markets more liquid.
- e) They allow traders to leverage their capital and hold big trading positions without tying up large sums of money.
 - However, like speculation, leverage cuts both ways and can sometimes do more harm than good. For example, leveraged futures bets destroyed Barings P.L.C., a venerable British bank that survived and grew for over two hundred years.
- f) They make more efficient trading possible.
- g) The process of trading itself generates useful information: for example it helps in transparent price discovery.

Gold Futures

Contract Terms, CME GOLD Futures

Product Symbol	GC	GC						
Venue	CME Globex, CME ClearPort, Open Outcry (New York)							
Hours (All Times are New York	CME Globex:	Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. Chicago Time/CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT)						
Time/ET)	CME ClearPort:	Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. Chicago Time/CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT)						
	Open Outcry: Monday – Friday 8:20 a.m 1:30 p.m. (7:20 a.m 12:30 p.							
Contract Size	100 troy ounces							
Price Quotation	U.S. Dollars and Cents per troy ounce							
Minimum Fluctuation	\$0.10 per troy ounce							
Termination of Trading	Trading terminates on the third last business day of the delivery month.							
Listed Contracts	Trading is conducted for delivery during the current calendar month; the next two calendar months; any February, April, August, and October falling within a 23-month period; and any June and December falling within a 60-month period beginning with the current month.							
Settlement Type	Physical							
Delivery Period	Delivery may take place on any business day beginning on the first business day of the delivery month or any subsequent business day of the delivery month, but not later than the last business day of the current delivery month.							
Grade and Quality	Gold delivered under this contract shall assay to a minimum of 995 fineness.							

CME Gold Futures



GLOBEX Gold Futures April 2023, 100 Troy Oz

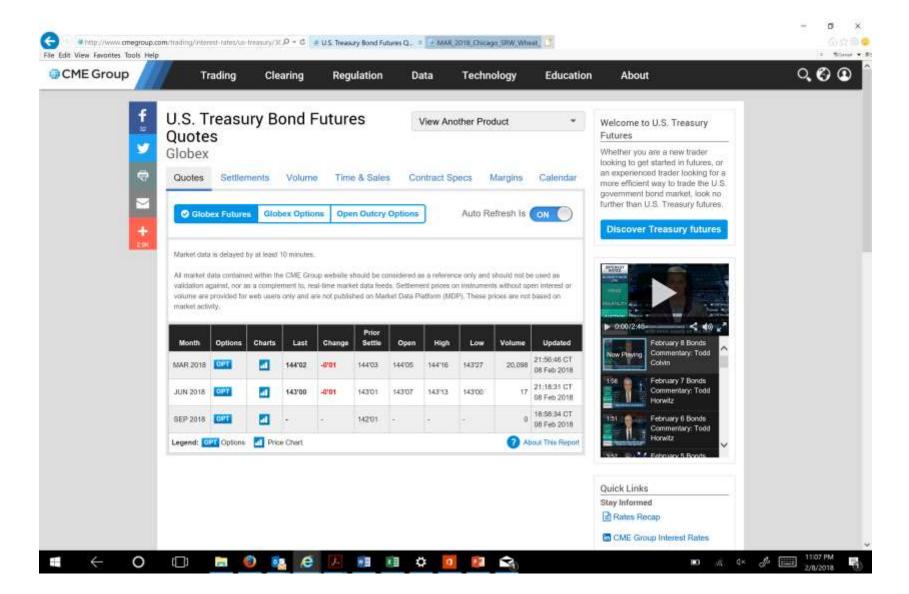


30 Year Treasury Bond

30-Year U.S. Treasury Bond Futures

Underlying Unit	One U.S. Treasury bond having a face value at maturity of \$100,000.						
Deliverable Grades	U.S. Treasury bonds that, if callable, are not callable for at least 15 years from the first day of the delivery month or, if not callable, have a remaining term to maturity of at least 15 years from the first day of the delivery month. The invoice price equals the futures settlement price times a conversion factor, plus accrued interest. The conversion factor is the price of the delivered bond (\$1 par value) to yield 6 percent.						
Price Quote	Points (\$1,000) and 1/32 of a point. For example, 134-16 represents 134 16/32. Par is on the basis of 100 points.						
Tick Size (minimum fluctuation)	One thirty-second (1/32) of one point (\$31.25), except for intermonth spreads, where the minimum price fluctuation shall be one-quarter of one thirty-second of one point (\$7.8125 per contract).						
Contract Months	The first three consecutive contracts in the March, June, September, and December quarterly cycle.						
Last Trading Day	Seventh business day preceding the last business day of the delivery month. Trading in expiring contracts closes at 12:01 p.m. on the last trading day.						
Last Delivery Day	Last business day of the delivery month.						
Delivery Method	Federal Reserve book-entry wire-transfer system.						
Settlement	U.S. Treasury Futures Settlement Procedures						
Position Limits	Current Position Limits						
Block Minimum	Block Trade Minimums						
All or None Minimum	All or None Minimums						
Rulebook Chapter	CBOT Chapter 18						
Trading Hours (All times listed	OPEN OUTCRY MON - FRI: 7:20 a.m 2:00 p.m.						
are Central Time)	CME GLOBEX SUN - FRI: 5:30 p.m 4:00 p.m.						

Treasury Bond Futures



USA 30-Year Treasury Futures, March 2018



Live Cattle Futures

Live Cattle Futures

Contract Size	40,000 pounds (~18 metric tons)								
Product Description	55% Choice, 45% Select, Yield Grade 3 live steers								
Pricing Unit	Cents per pound								
Tick Size (minimum fluctuation)	\$.00025 per pound (=\$10 per contract)								
Daily Price Limits	\$.03 per pound above or below the previous day's settlement price								
Trading Hours (All times listed are Central Time)	CME Globex (Electronic Platform)	MON 9:05 a.m FRI 1:55 p.m. Central Time Daily trading halts 4:00 p.m 5:00 p.m. Central Time							
Time)	Open Outcry (Trading Floor)	MON-FRI: 9:05 a.m1:00 p.m. Central Time							
Last Trade Date/Time View Calendar	Last business day of the contract month, 12:00 p.m.								
Contract Months View Listings	Feb, Apr, Jun, Aug, Oct, Dec								
Settlement Procedure	Physical Delivery See CME Rule 10103.								
Position Limits	Non-Spot: 5,400 contracts in any contract month Spot: 450/300 contracts All months combined: n/a See CME Rule: 10102.E								
Ticker Symbol View Product	CME Globex (Electronic LE Platform) 48=Clearing								

Live Cattle Quotes, 2018 (non-storable agricultural)

Month	Options	Charts	Last	Change	Prior Settle	Open	High	Low	Volume	Hi / Low Limit	Updated
FEB 2018	OPT		125.800	+0.200	125.600	125.775	127.325	125.425	2,554	128.775 / 122.775	18:59:27 CT 08 Feb 2018
APR 2018	OPT		123.850	-0.125	123.975	123.975	125.775	123.450	23,432	126,725 / 120,725	18:59:19 CT 08 Feb 2018
JUN 2018	OPT		115.650	-0.075	115.725	115,750	117.225	115.325	12,186	118.525 / 112.525	18:59:24 CT 08 Feb 2018
AUG 2018	OPT		112.950	-0.325	113.275	113.275	114.375	112.650	7,509	116.000 / 110.000	18:59:20 CT 08 Feb 2018
OCT 2018	OPT.		114.800	-0.600	115,400	115.375	116.125	114.525	3,428	117,875 / 111,875	18:58:33 CT 08 Feb 2018
DEC 2018	OPT		116.800	-0.375	117.175	117.000	118.000	116.425	1,516	119.825 / 113.825	18:58:17 CT 08 Feb 2018
FEB 2019	OPT		117.525	-0.225	117.750	117.900	118.625	117.350	174	120.550 / 114.550	18:59:03 CT 08 Feb 2018
APR 2019	OPT		117.800	+0.075	117.725	118.075	118.600	117.500	43	120,600 / 114,800	18:58:28 CT 08 Feb 2018
JUN 2019	OPT		111.575	+0.225	111.350	111.500	112.075	111.350	40	114.575 / 106.575	18:59:29 GT 08 Feb 2018

Feb 2019 Live Cattle Futures



Corn Futures Contract, (5,000 bu., March, May, July, September & December contracts, for Delivery)

Month	Options	Charts	Last	Change	Prior Settle	Open	High	Low	Volume	Hi / Low Limit	Updated
MAR 2018	OPT		365'2	-0'4	365'6	364'6	365'2	364'4	2,770	390'6 / 340'6	21:15:14 CT 08 Feb 2018
MAY 2018	OPT		372'6	-0'4	373'2	3722	373'0	372'0	974	398'2 / 348'2	21:12:44 CT 08 Feb 2018
JUL 2018	OPT		380'2	-0'6	3810	379'6	380'2	379'4	527	406'0 / 356'0	21:14:02 CT 08 Feb 2018
SEP 2018	OPT		386'4	-0'6	3872	386'0	386'4	385%	568	4122 / 3622	19:52:17 CT 08 Feb 2018
DEC 2018	OPT		394'0	-10	395'0	393'6	394'2	393'4	888	420'0 / 370'0	21:06:37 CT 08 Feb 2018
MAR 2019	OPT		401'2	-1'0	4022	401'0	401'4	400'6	72	427°2 / 377°2	19:44:24 CT 08 Feb 2018
MAY 2019	OPT				407'0		2		0	432'0 / 382'0	19:37:10 CT 08 Feb 2018
JUL 2019	OPT		•		411'4	et i	-,	-	0	436'4 / 386'4	19:33:49 CT 08 Feb 2018
SEP 2019	OPT		-		4076				0	432'6 / 382'6	18:59:05 CT 08 Feb 2018
DEC 2019	OPT	•	409'0	-1'0	410'0	409'0	409'0	409'0	10	435'0 / 385'0	19:15:30 CT 08 Feb 2018
MAR 2020	OPT				4162		-		0	4412/ 3912	18:59:04 CT 08 Feb 2018
MAY 2020	OPT				420'0	-		-	0	445°0 / 395°0	18:58:39 CT 08 Feb 2018
JUL 2020	ОРТ		-		4252		40	-	0	450'2 / 400'2	18:58:35 CT 08 Feb 2018
SEP 2020	CPT		-	÷	422'4	-	-	-	0	447'4 / 397'4	18:58:23 CT 08 Feb 2018
DEC 2020	OPT				414'4				0	439'4 / 389'4	18:59:05 CT 08 Feb 2018

September 2018 Corn Futures



Weather Index **Futures:** Heating and Cooling Degree Days (HDD, CDD)

Degree Days Index (HDD) Futures

Contract Size	\$20 times the respective CME Degree Days (HDD) Index							
Product Description	Heating Degree Days (HDD) for US Cities							
Pricing Unit	Dollars per index point							
Tick Size (minimum fluctuation)	1 index point (= \$20 per contract)							
Daily Price Limits	n/a							
Trading Hours (All times listed are Central Time)	CME Globex SUN 5:00 p.m FRI 3:15 p.m. (Electronic Daily trading halts 3:15 p.m 5:00 p.m. Platform)							
Last Trade Date/Time View Calendar	First business day that is at least two calendar days after the end of the contract month, 9:00 a.m.							
Contract Months* View Listings	HDD: Nov, Dec, Jan, Feb, Mar plus Oct and Apr							
Settlement Procedure	Cash settlement - See CME Rule 40303							
Position Limits View Rulebook	All months combined: 10,000 contracts See CME Rule 40302.D.							
	Atlanta = H1 Chicago = H2 Cincinnati = H3 New York = H4 Dallas = H5 Philadelphia = H6							

Open Interest and Volume

- Open interest is the number of outstanding contracts for a particular maturity month.
 - Based on round-turn measure = one long +one short
 - Indicates exposure to delivery
 - Will generally fall towards contract end as traders/hedgers unwind and cancel their positions
 - Open interest on close of last trading day is the amount for delivery or cash settlement
- Volume is the number of contracts traded on a given day
 - Based on number of (round-turn) trades total
 - The greater the volume the more liquidity there is in the market
 - Generally higher for near-term contracts as traders/hedgers unwind positions
 - But can spike with market volatility and price spikes in either direction

Summary

- Futures contracts are financial instruments that allow for the purchase or selling, via delivery of a physical commodity, or by cash settlement, according to specific standards as established by 'contract' at some future date.
- The daily prices of futures contracts reflect the market's assessment of what the price will be, not in the present, but at some future date as defined by the delivery month and day of the contract itself
- Contracts provide a means of transparent price discovery by providing an indicator in the present of what the price will be in the future.
- The random nature of futures contracts is determined by future assessments of supply and demand