Grain Marketing Basics Workshop

Matthew Gammans, PhD
MSU Extension
gammansm@msu.edu

About this workshop

- Tuesday nights from 7pm-9pm February 23 through March 9
- Recordings will be available the next day
- Will be a mix of pre-recorded videos, live presentation, and time for Q&A

Our goal

- To understand the difference between cash price, futures prices, and basis.
- Introduce a few basic grain pricing tools, including forward contracts, hedging, options, minimum price contracts.
- Help attendees develop the tools to work with merchandisers to develop a marketing plan

Tonight's plan

- What's the cash market?
- What's the futures market?
- What's basis?
- What's a hedge?
- When do you lift a hedge?

Next week:

- Pricing decision tool
- More on hedge-to-arrive contracts
- Basis contracts
- Options (maybe)

The cash price of grain

Cash Price = Futures Price + Basis

- A price agreement for immediate delivery
- No commitment to deliver a specific amount
- Advantages: can get cash quickly, easy to understand

Cash Price = Futures Price + Basis

- All three prices vary over time
- Basis depends on location
- The price you get for your grain depends on the futures price and the basis
- **BUT you don't have to lock in these prices at the same time**

Futures price

Cash Price = Futures Price + Basis

- Think about the futures price as the *world price*
- Can be quoted at various points in the future
  (March corn futures price, July corn futures price, etc.)

Futures

- **Futures contract:** an obligation to buy or sell a fixed quantity of a well-defined commodity at some point in the future
- The price that is agreed to within the contract is the **futures price**
- **Futures exchange:** centralized marketplaces that bring buyers and sellers together.

CME video on futures markets

- https://www.youtube.com/watch?v=pd7OEyZKkfs

The futures market for grain

- Can think about this as the *world market*
- These are set by world supply and demand
- What's the big advantage? Standardization
  - WHAT: #2 Yellow Corn
  - WHEN: Contract experation date
  - HOW MUCH: 5,000 bushels
  - WHERE: Specified delivery point along Illinois River
- Another benefit: eliminating counter-party risk

Economic functions of futures markets

- Transfer risk:
  - Speculators
  - Hedgers
- Price discovery
- Information collection
- Coordination of economic activity
- Market stabilization
- Flexibility in pricing products

A few symbols

- Corn: C
- Soy: S
- Soft Red Winter Wheat: W

MONTH	MONTH CODE
January	F
February	G
March	H
April	J
May	K
June	M
July	N
August	Q
September	U
October	V
November	X
December	Z

Available Contract Months:

- Corn: H, K, N, U, Z
- Soy: F, H, K, N, Q, U, X
- Soft Red WW: H, K, N, U, Z

Current Chicago Mercantile Exchange Quotes

https://www.cmegroup.com/trading/agricultural/grain-and-oilseed/corn_quotes_globex.html

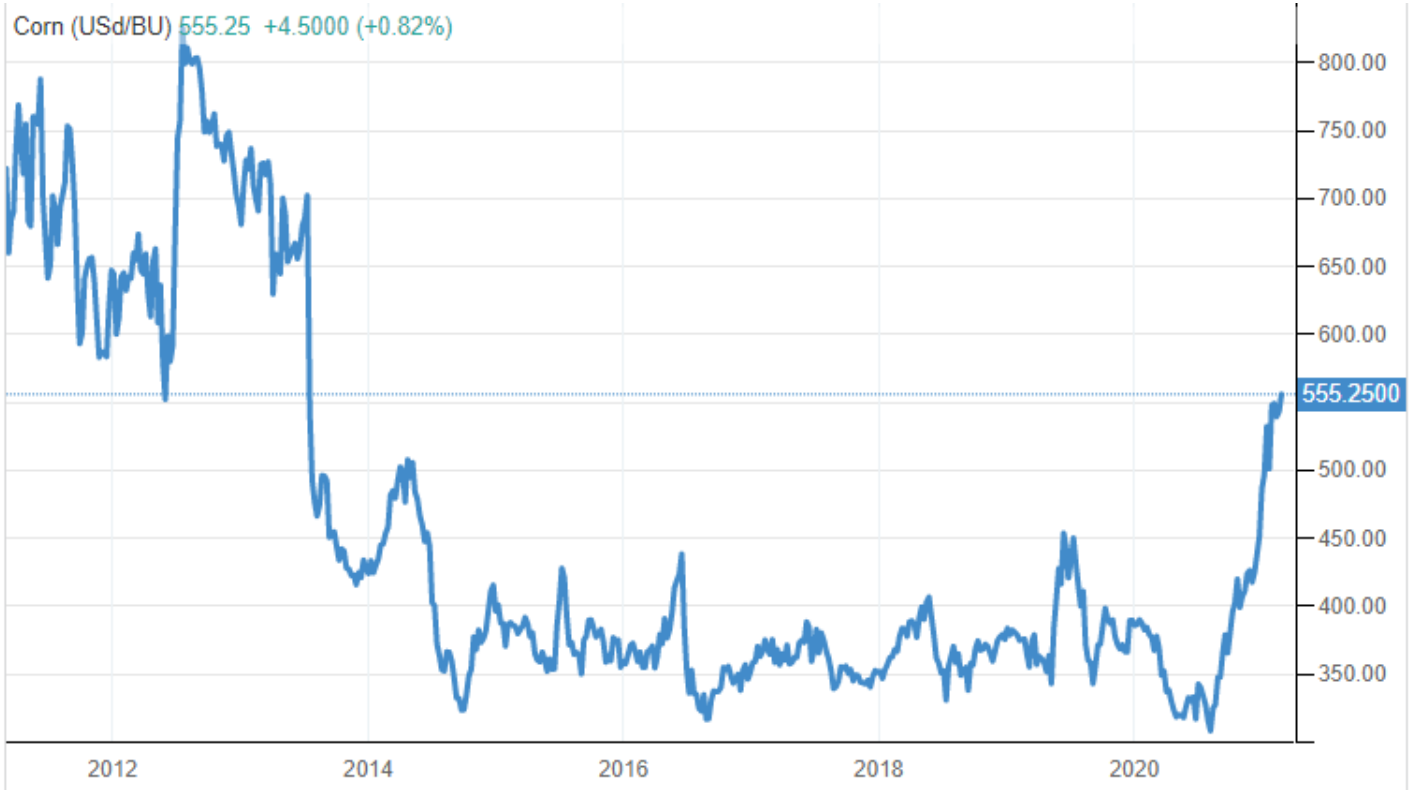
Corn futures contract

CONTRACT UNIT	5,000 bushels	
PRICE QUOTATION	U.S. cents per bushel	
TRADING HOURS	CME Globex:	Sunday – Friday, 7:00 p.m. – 7:45 a.m. CT and Monday – Friday, 8:30 a.m. – 1:20 p.m. CT TAS: Sunday - Friday 7:00 p.m. - 7:45 a.m. and Monday - Friday 8:30 a.m. - 1:15 p.m. CT
	CME ClearPort:	Sunday 5:00 p.m. - Friday 5:45 p.m. CT with no reporting Monday - Thursday from 5:45 p.m. – 6:00 p.m. CT
MINIMUM PRICE FLUCTUATION	1/4 of one cent (0.0025) per bushel = $12.50 TAS: Zero or +/- 4 ticks in the minimum tick increment of the outright	
LISTED CONTRACTS	9 monthly contracts of Mar, May, Sep and 8 monthly contracts of Jul and Dec listed annually after the termination of trading in the December contract of the current year.	
SETTLEMENT METHOD	Deliverable	
TERMINATION OF TRADING	Trading terminates on the business day prior to the 15th day of the contract month.	
LAST DELIVERY DATE	Second business day following the last trading day of the delivery month.	
GRADE AND QUALITY	Through December 2018: #2 Yellow at contract Price, #1 Yellow at a 1.5 cent/bushel premium, #3 Yellow at a 1.5 cent/bushel discount. As of March 2019: #2 Yellow at contract Price, #1 Yellow at a 1.5 cent/bushel premium, #3 Yellow at a discount between 2 and 4 cents/bushel depending on broken corn and foreign material and damage grade factors.	

Wheat futures contract

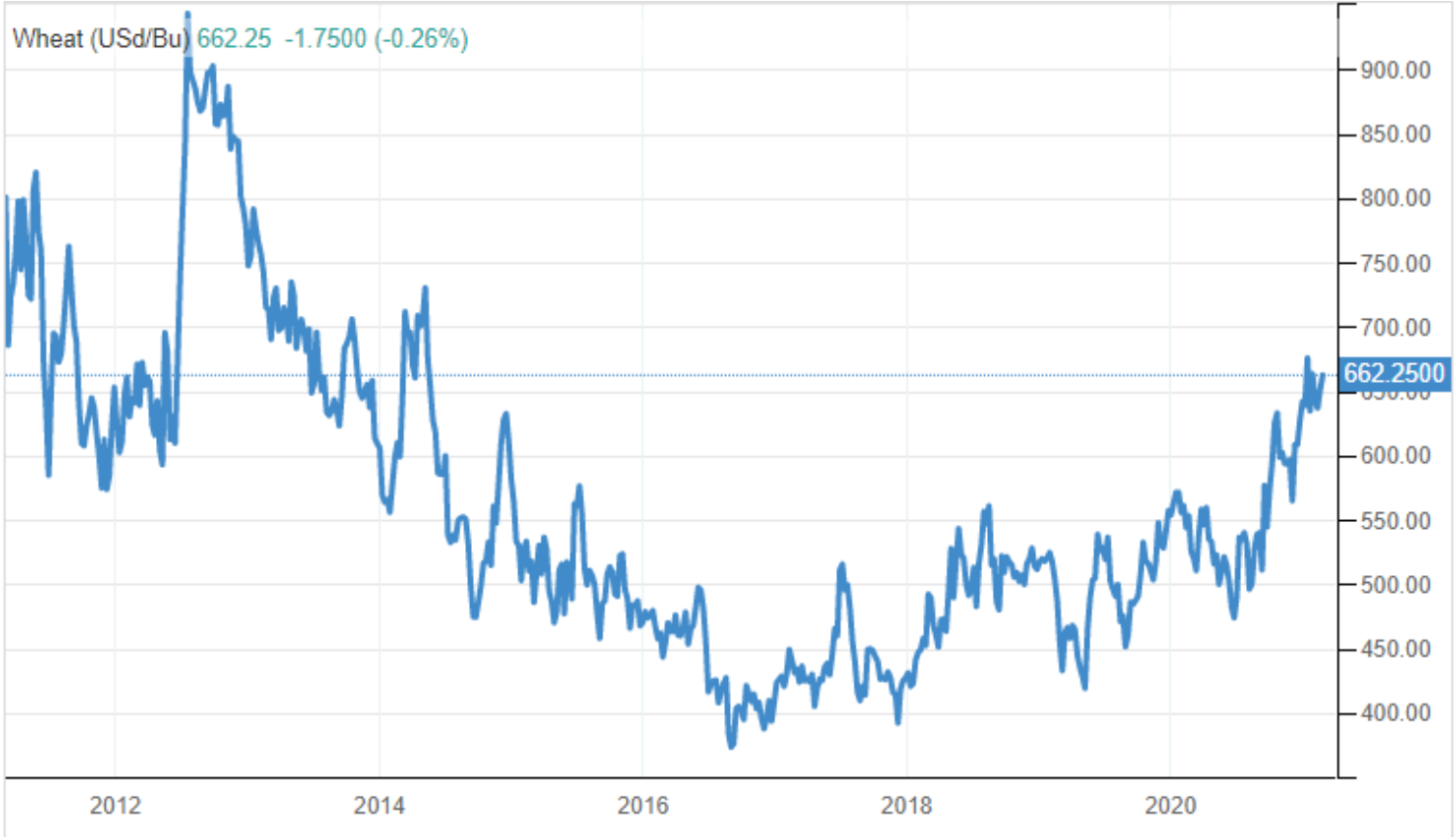
CONTRACT UNIT	5,000 bushels (~ 136 metric tons)	
PRICE QUOTATION	U.S. cents per bushel	
TRADING HOURS	CME Globex:	Sunday – Friday: 7:00 p.m. – 7:45 a.m. CT and Monday – Friday: 8:30 a.m. – 1:20 p.m. CT TAS: Sunday - Friday 7:00 p.m. - 7:45 a.m. and ? Monday - Friday 8:30 a.m. - 1:15 p.m. CT
	CME ClearPort:	Sunday 5:00 p.m. - Friday 5:45 p.m. CT with no reporting Monday - Thursday from 5:45 p.m. – 6:00 p.m. CT
MINIMUM PRICE FLUCTUATION	1/4 of one cent (0.0025) per bushel = $12.50	
LISTED CONTRACTS	15 monthly contracts of Mar, May, Jul, Sep, Dec listed annually following the termination of trading in the July contract of the current year.	
SETTLEMENT METHOD	Deliverable	
TERMINATION OF TRADING	Trading terminates on the business day prior to the 15th day of the contract month.	
LAST DELIVERY DATE	Second business day following the last trading day of the delivery month.	
GRADE AND QUALITY	#2 Soft Red Winter at contract price, #1 Soft Red Winter at a 3 cent premium, other deliverable grades listed in Rule 14104.	

Corn futures over time



Soy futures over time

Wheat futures over time



Simple example of futures

Date	Action	July futures price	Net
Feb 15	BUY	5.20	

Simple example of futures

Date	Action	July futures price	Net
Feb 15	BUY	5.20	
March 20	SELL	5.60	0.40

Simple example of futures

Date	Action	July futures price	Net
Feb 15	BUY	5.20	
March 20	SELL	5.60	0.40
May 12	SELL	5.90	0.40

Simple example of futures

Date	Action	July futures price	Net
Feb 15	BUY	5.20	
March 20	SELL	5.60	0.40
May 12	SELL	5.90	0.40
June 1	BUY	5.10	1.20

Simple example of futures

Date	Action	July futures price	Net
Feb 15	BUY	5.20	
March 20	SELL	5.60	0.40
May 12	SELL	5.90	0.40
June 1	BUY	5.10	1.20

Total gain is $1.20*5,000 bushels = $6,000

Hedging

- **Hedging**: Taking the opposite position in the futures market as in the cash market
- Farmers are naturally **long** in the cash market....
  You bought your harvest!
- Hedging can reduce your risk in the cash market

Hedging

- **Hedging**: Taking the opposite position in the futures market as in the cash market
- Farmers are naturally **long** in the cash market....
  You bought your harvest!
- Hedging can reduce your risk in the cash market

https://www.youtube.com/watch?v=uYyMdMYSXWU&list=RDCMUCLC4PuFlyKwK03Sc29YLEGQ&index=3

Hedging example with no basis

Basis

Cash Price = Futures Price + Basis

- Difference between cash price and futures price
- Usually defined as the different between current cash price and the futures price with the nearest expiration date
  - Example: today's basis in Weberville is the difference between cash prices at Weberville and today's price on a March futures contract
- Reflects *local* conditions
- In Michigan, usually negative

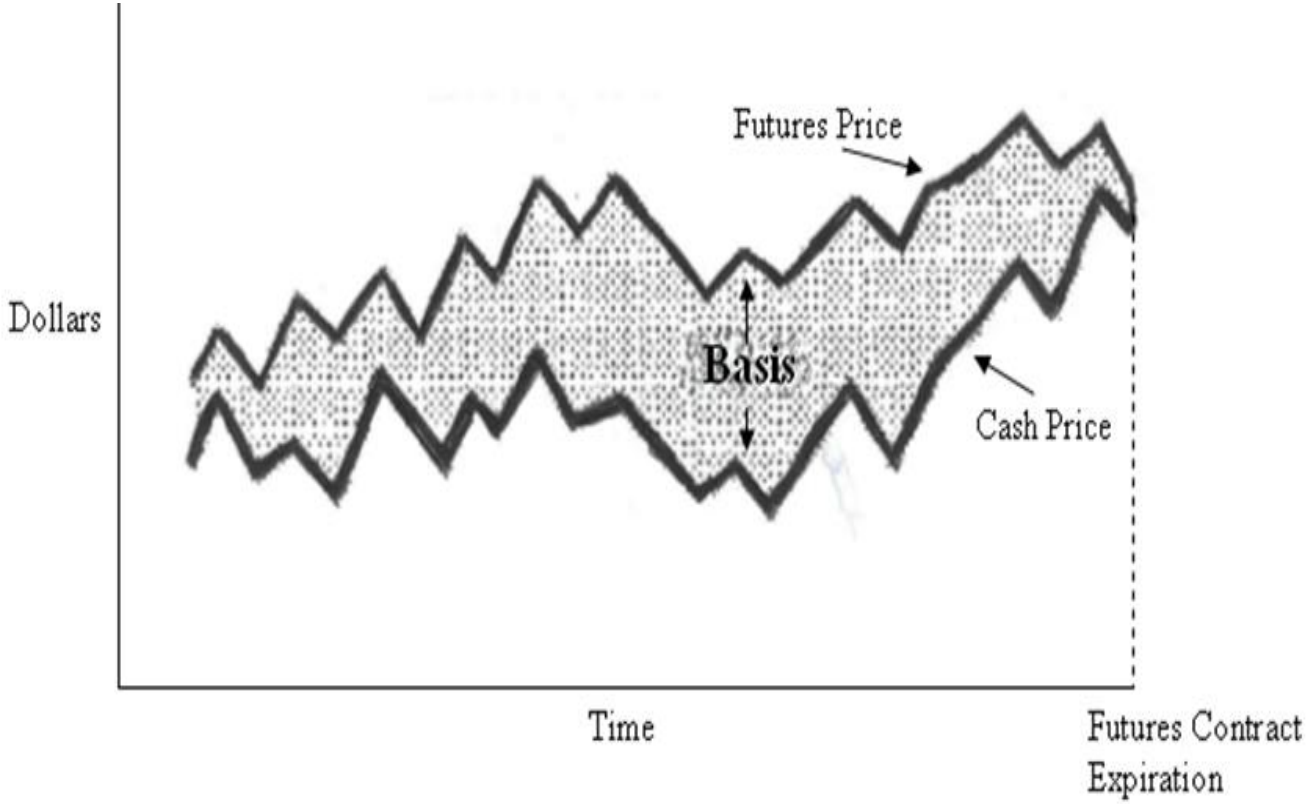
Factors affecting basis

- Transportation costs
- Storage and interest costs
- Local supply and demand
  - Ethanol plant locations
  - Geographic variation in yields

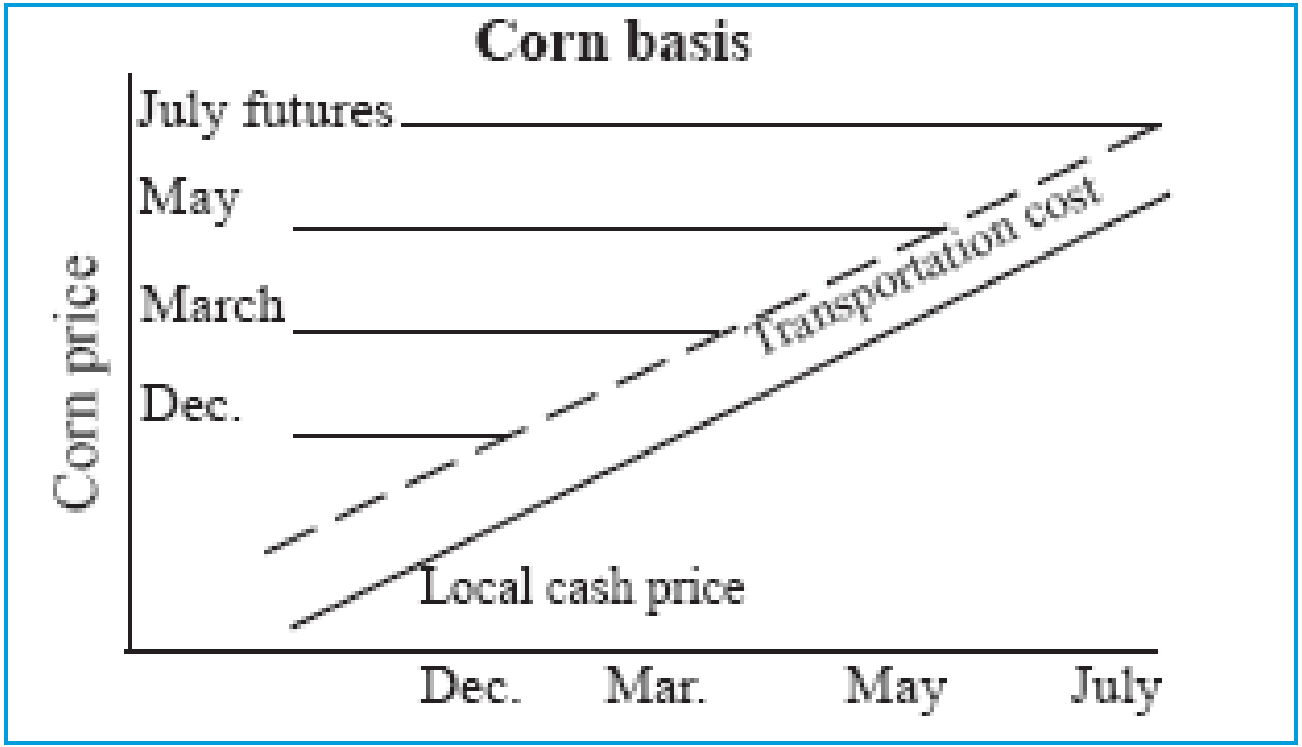
CME video on basis

- https://www.cmegroup.com/education/courses/introduction-to-grains-and-oilseeds/learn-about-basis-grains.html

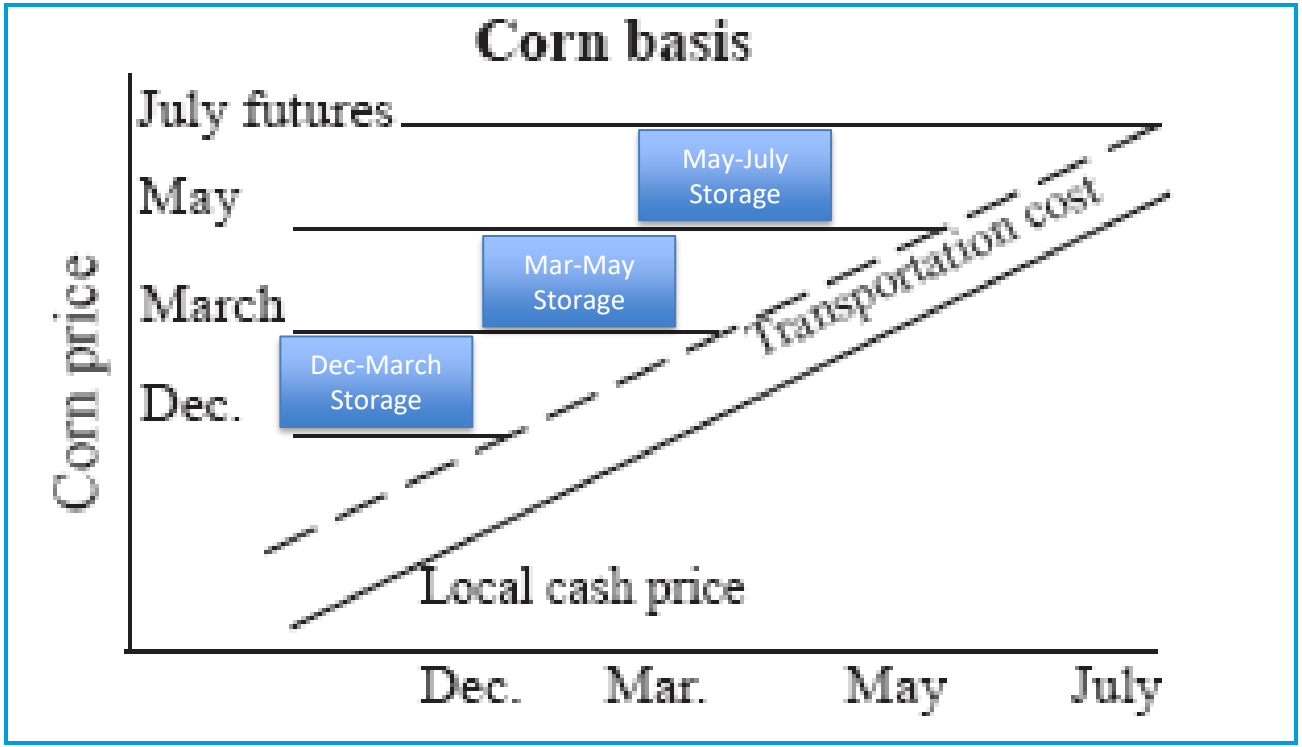
Simplified graphic of basis



Theoretical graphic of basis



Theoretical graphic of basis



CME video on convergence

- https://www.cmegroup.com/education/courses/introduction-to-grains-and-oilseeds/learn-about-basis-grains.html

Current futures and basis

https://www.dtnpf.com/agriculture/web/ag/markets/futures

Purdue basis tool

https://ag.purdue.edu/cropbudget/multi.php

Hedging

- **Hedging**: Taking the opposite position in the futures market as in the cash market
- Farmers are naturally **long** in the cash market....
  You bought your harvest!
- Hedging can reduce your risk in the cash market

Hedging example with basis and storage

Hedging example with basis and storage

	Expected	Actual
July Futures (price paid)	$5.47	
Expected June Basis	-0.30	
Actual June Basis		
Storage		
Brokerage		
NET PRICE		

Hedging example with basis and storage

	Expected	Actual
July Futures (price paid)	$5.47	
Expected June Basis	-0.30	
Actual June Basis		
Storage	4*-0.02=-0.08	
Brokerage	-0.01	
NET PRICE		

Hedging example with basis and storage

	Expected	Actual
July Futures (price paid)	$5.47	
Expected June Basis	-0.30	
Actual June Basis		
Storage	4*-0.02=-0.08	
Brokerage	-0.01	
NET PRICE	4.08	

Hedging example with basis and storage

	Expected	Actual
July Futures (price paid)	$5.47	$5.47
Expected June Basis	-0.30	
Actual June Basis		-0.25
Storage	4*-0.02=-0.08	
Brokerage	-0.01	
NET PRICE	4.08	

Hedging example with basis and storage

	Expected	Actual
July Futures (price paid)	$5.47	$5.47
Expected June Basis	-0.30	
Actual June Basis		-0.25
Storage	4*-0.02=-0.08	-0.08
Brokerage	-0.01	-0.01
NET PRICE	4.08	

Hedging example with basis and storage

	Expected	Actual
July Futures (price paid)	$5.47	$5.47
Expected June Basis	-0.30	
Actual June Basis		-0.25
Storage	4*-0.02=-0.08	-0.08
Brokerage	-0.01	-0.01
NET PRICE	4.08	4.13

When do you lift a hedge?

- You don't have to hold a hedge until the futures expiration date
- If you like the current basis and expect it to weaken, you can get out of your hedge
- Sell cash and buy futures
- How do we know the right time to do this?

Break-even basis

- **Break-even basis**: Basis necessary to exactly offset storage costs, locking in the current cash price as a net price.
- Basis needs to be weaker than break-even basis line to consider hedging
- When basis strengthens above break-even basis, consider lifting hedge

Break-even table

- Storage: 0.03
- June expected basis: -0.20

Date	Basis	Break-even basis
October 15		
November 15		
December		
January 15		
February 15		
March 15		
April 15		
May 15		
June 15		-0.20

Break-even table

- Storage: 0.03
- June expected basis: -0.20

Date	Basis	Break-even basis
October 15		
November 15		
December		
January 15		
February 15		
March 15		
April 15		
May 15		-0.23
June 15		-0.20

Break-even table

- Storage: 0.03
- June expected basis: -0.20

Date	Basis	Break-even basis
October 15		-0.44
November 15		-0.41
December		-0.38
January 15		-0.35
February 15		-0.32
March 15		-0.29
April 15		-0.26
May 15		-0.23
June 15		-0.20

Break-even table

- Storage: 0.03
- June expected basis: -0.20

Date	Basis	Break-even basis
October 15	-0.60	-0.44
November 15		-0.41
December		-0.38
January 15		-0.35
February 15		-0.32
March 15		-0.29
April 15		-0.26
May 15		-0.23
June 15		-0.20

Break-even table

- Storage: 0.03
- June expected basis: -0.20

Date	Basis	Break-even basis
October 15	-0.60	-0.44
November 15	-0.50	-0.41
December	-0.44	-0.38
January 15	-0.39	-0.35
February 15	-0.34	-0.32
March 15	-0.29	-0.29
April 15	-0.20	-0.26
May 15		-0.23
June 15		-0.20

Break-even table

- Storage: 0.03
- June expected basis: -0.20

Date	Basis	Break-even basis
October 15	-0.60	-0.44
November 15	-0.50	-0.41
December	-0.44	-0.38
January 15	-0.39	-0.35
February 15	-0.34	-0.32
March 15		-0.29
April 15		-0.26
May 15		-0.23
June 15		-0.20

Break-even table

- Storage: 0.03
- June expected basis: -0.20

Date	Basis	Break-even basis
October 15	-0.60	-0.44
November 15	-0.50	-0.41
December	-0.44	-0.38
January 15	-0.39	-0.35
February 15	-0.34	-0.32
March 15	-0.29	-0.29
April 15	-0.20	-0.26
May 15		-0.23
June 15		-0.20

How to set up a hedging account?

- Decide on brokerage firm
- Paperwork—will require information on financial condition
- Remember: minimum contract size is 5,000 bushels
- Downside: margin calls

Hedge-to-arrive contracts (HTA)

- Cash contract with elevator
- Locks in futures price for a specific delivery date
- Must deliver to specific location
- Fees (for benefit of not handling margin calls)

Hedge-to-arrive example

- Date: February 15
- Locks in futures price for a specific delivery date
- Must deliver to specific location
- Fees (for benefit of not handling margin calls)

Date	May. Futures	Basis	Cash Price
Sep 15	14.10	-1.00	13.10
Feb 23			
Net price			

Hedge-to-arrive example

- Date: February15
- Locks in futures price for a specific delivery date
- Must deliver to specific location
- Fees (for benefit of not handling margin calls)

Date	May. Futures	Basis	Cash Price
Sep 15	14.10	-1.00	13.10
Feb 23		-0.40	
Net price			

Hedge-to-arrive example

- Date: February15
- Locks in futures price for a specific delivery date
- Must deliver to specific location
- Fees (for benefit of not handling margin calls)

Date	May. Futures	Basis	Cash Price
Sep 15	14.10	-1.00	13.10
Feb 23		-0.40	
Net price	14.20+(-0.40)=13.80+storage		

Hedge-to-arrive example

- Date: February15
- Locks in futures price for a specific delivery date
- Must deliver to specific location
- Fees (for benefit of not handling margin calls)

Date	May. Futures	Basis	Cash Price
Sep 15	14.10	-1.00	13.10
Feb 23		-0.40	
Net price	14.20+(-0.40)=13.80+storage		

What if we lock in futures and basis simultaneously?

- That's a cash sale or a forward contract.
- Forward contract
  - Negotiate bushels, delivery, and price
- As we'll discuss next week, we use these tools when we expect basis to weaken
- When you use these tools, you're making two decisions:
  - You like the futures price
  - AND you like the basis

Cash Price = Futures Price + Basis

- Cash price depends on futures price and basis
- Futures price is the world price
- Basis depends on local factors
- Futures and basis can be locked in at different times
- A hedge locks in a net price, but still has basis risk
- If you know your storage costs and calculate an expected basis, you can calculate your break-even basis

Cash Price = Futures Price + Basis

- Cash price depends on futures price and basis
- Futures price is the world price
- Basis depends on local factors
- Futures and basis can be locked in at different times
- A hedge locks in a net price, but still has basis risk
- If you know your storage costs and calculate an expected basis, you can calculate your break-even basis

Questions?