FUTURES AND PRICE RISK MANAGEMENT

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Marketing is **one** element of a risk management plan.

This presentation introduces two marketing tools for managing price risk:

- Hedging with futures and options
- Forward contracting

Should be used in conjunction with other tools, such as insurance

Weather
Management
Technology

Marketing

$$Gross\ farm\ profit = (price_A \times yield_A \times acres_A) + (price_B \times yield_B \times acres_B) + \cdots$$

THE MARKETING PLAN – GETTING READY

1

Establish
- A cash flow budget
- Liquidity of the enterprise
- If the farm enterprise is profitable

2

Compute breakeven price
- Per acre
- Per bushel

More information can be found in chapter 5 in the "Comprehensive Risk Management Strategies: Putting it All Together" by Piggott, Marra, Goodwin, Fackler, and Denaux https://cals.ncsu.edu/are-extension/educational-material/

THE MARKETING PLAN – AFTER 1 AND 2

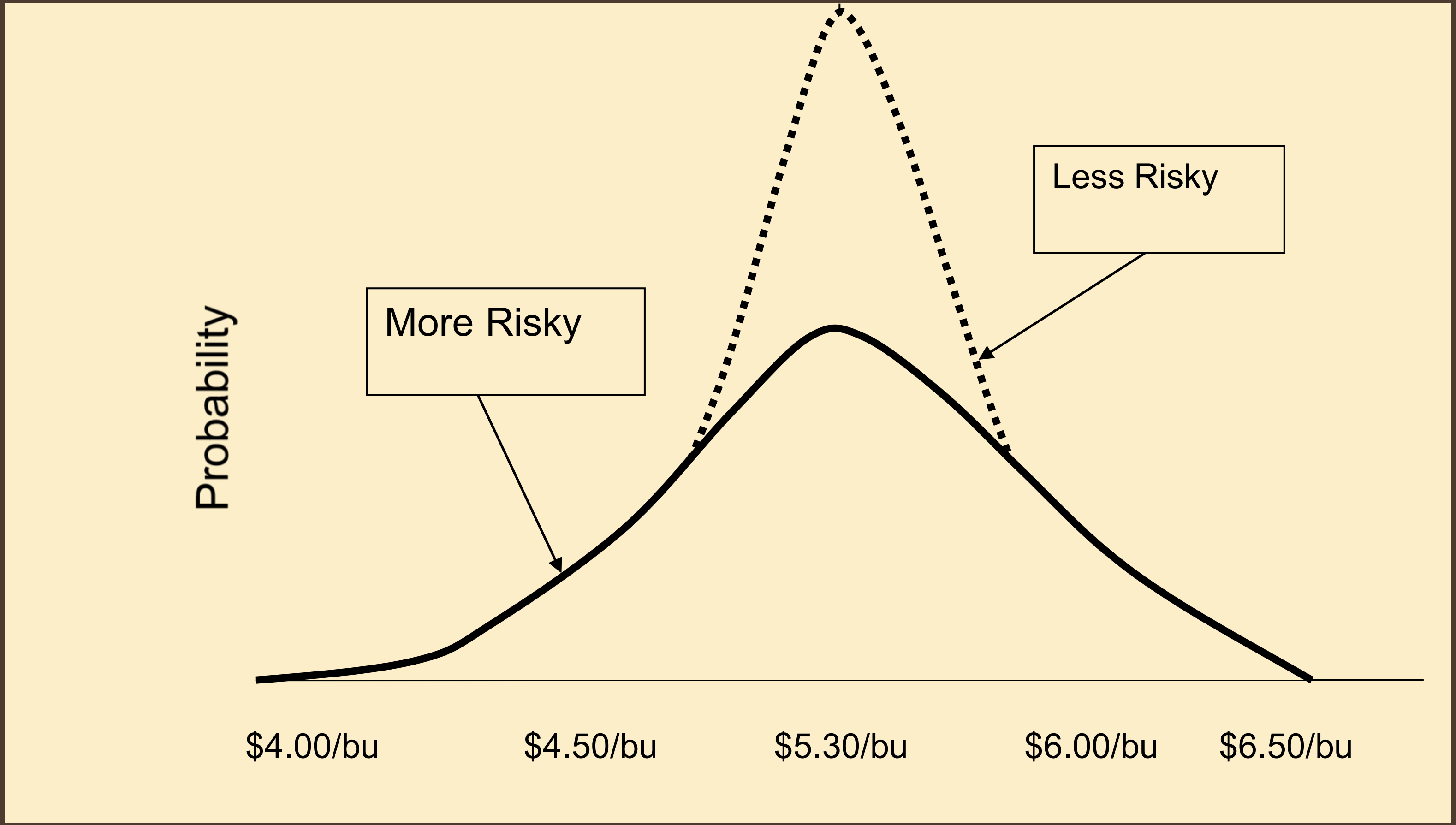
Now it is possible to make a marketing plan which will ultimately depend on individual

- Price objectives
- Risk preferences
- Other considerations

More information can be found in chapter 5 in the "Comprehensive Risk Management Strategies: Putting it All Together" by Piggott, Marra, Goodwin, Fackler, and Denaux https://cals.ncsu.edu/are-extension/educational-material/

VISUALIZING PRICE RISK

Though we may have expectations - we don't know what commodity prices will be in advance.



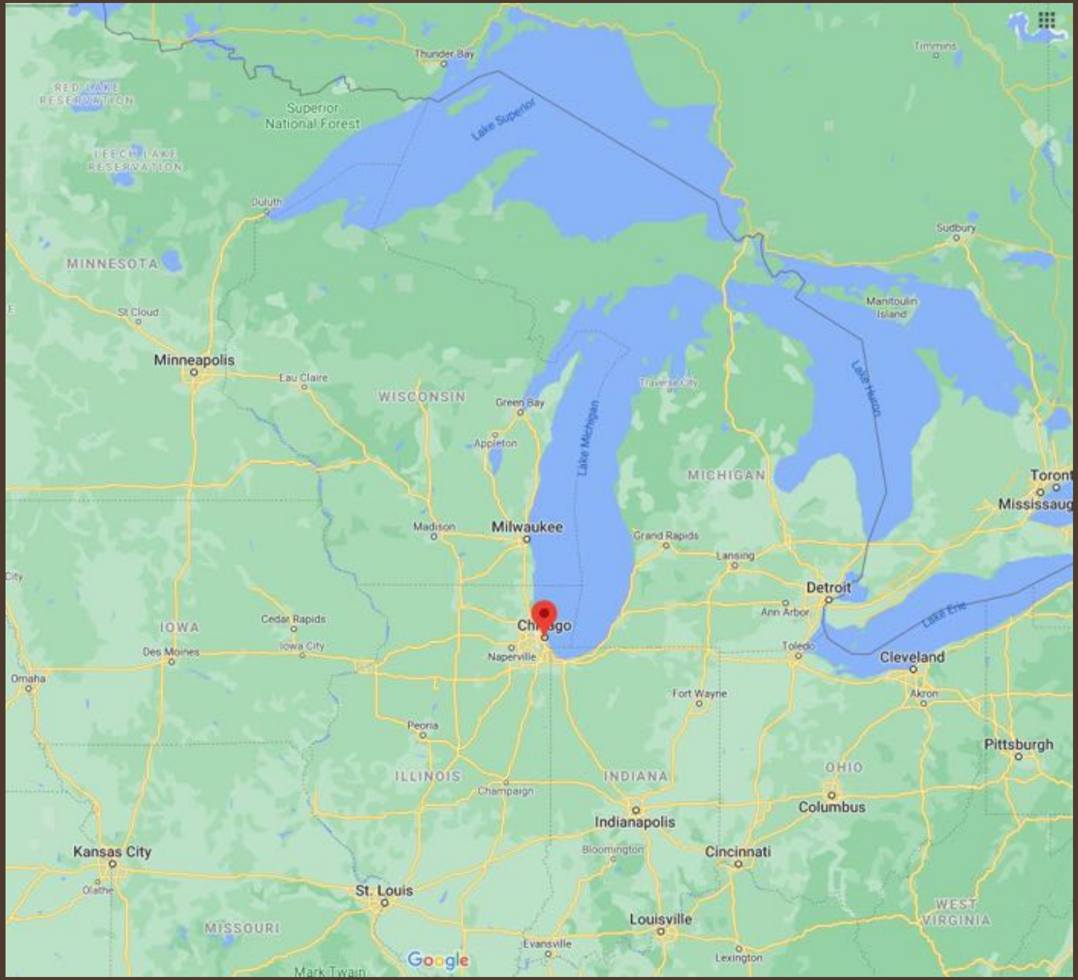
Credit to Nick Piggott for this graphic!

MENU OF COMMON HEDGING TOOLS

How can we deal with fluctuations in input/output prices?

1. Futures
2. Options
3. Forward contracting with local buyer/seller
   a) Forward price contract
   b) Basis contract

SIMPLE SHORT HEDGE EXAMPLE
[MANY SIMPLIFYING ASSUMPTIONS]

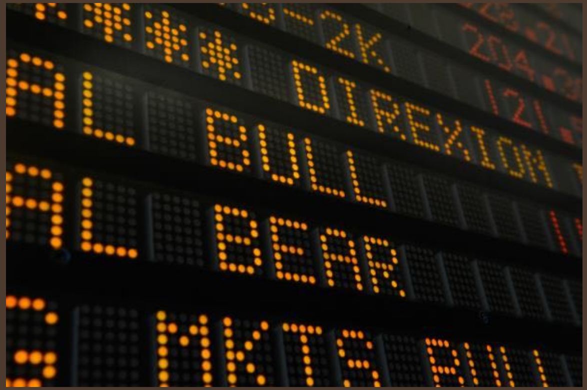


In April, an IL farmer wants to establish a price for 5000 bushes of corn that they expect to harvest and sell in September.

The farmer sees that the futures price for delivery in September is \$4.95/bu.

The farmer views the price favorably and locks in \$4.95/bu by selling 1 September corn futures contract (going "short").

FUTURES CONTRACTS



Standardized forward contract

A buyer and seller agree on price today for future delivery - futures are homogenous with respect to contract specifications (size, delivery date, quality, etc.).

- The exchange specifies the all terms of the contract except price
- Buyer and seller make equal and opposite commitments which are legal obligations
- Holder can liquidate any time prior to delivery month - most contracts do not result in delivery and are offset before expiration

For every buyer there is a seller → for every long there is a short

buyer and seller make equal and opposite commitments

SIMPLE SHORT HEDGE EXAMPLE
[MANY SIMPLIFYING ASSUMPTIONS]

For every __gain__ in the price per bushel of corn, say from $4.95/bu to $5.19/bu

- The value of their **inventory** increases

  (new price/unit inventory – original price/unit inventory)*(amount in inventory)

  ($5.19/bu – 4.95/bu)*(5000bu)= **$1,200**

- They lose money on their **futures position**

  (futures sell price – futures buy price)*(contract size)*(# contracts)

  ($4.95/bu – $5.19/bu)*(5000bu)*(1 contract)= **- $1,200**

SIMPLE SHORT HEDGE EXAMPLE
[MANY SIMPLIFYING ASSUMPTIONS]

For every **decline** in the price per bushel of corn, say from \$4.95/bu to \$4.67/bu

- The value of their **inventory** **decreases**

  (new price/unit inventory – original price/unit inventory)*(amount in inventory)

  (\$4.67/bu – 4.95/bu)*(5000bu)= **- \$1,400**

- They **gain** money on their **futures position**

  (futures sell price – futures buy price)*(contract size)*(# contracts)

  (\$4.95/bu – \$4.67/bu)*(5000bu)*(1 contract)= **\$1,400**

SIMPLE SHORT HEDGE EXAMPLE

[MANY SIMPLIFYING ASSUMPTIONS]

If price of corn ↑ then value of corn in inventory ↑ and futures position ↓

If price of corn ↓ then value of corn in inventory ↓ and futures position ↑

SIMPLE SHORT HEDGE EXAMPLE
[MANY SIMPLIFYING ASSUMPTIONS]

In September, the farmer harvests their crop and either:

Delivers on the futures contract to one of the delivery points specified in the contract

OR

Sells corn in the local market & simultaneously offsets their futures position by buying a futures contract

How did they know which action to take in the spring?

"Do today in the futures market what you must do in the cash market later."

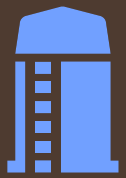
From Piggott, Marra, Goodwin, Fackler, and Denaux https://cals.ncsu.edu/are-extension/educational-material/

SIMPLE SHORT HEDGE EXAMPLE

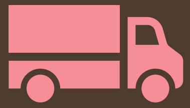
[MANY SIMPLIFYING ASSUMPTIONS]

We're making strict assumptions to make this a **perfect** hedge.

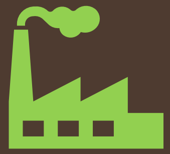
- There is a futures contract expiring at the same time, or shortly after when the farmer intends to sell the corn in inventory.
- This farmer is at a terminal market that is a futures delivery point.
- The corn in inventory is the same quality as specified in the futures contract.



TIME



SPACE



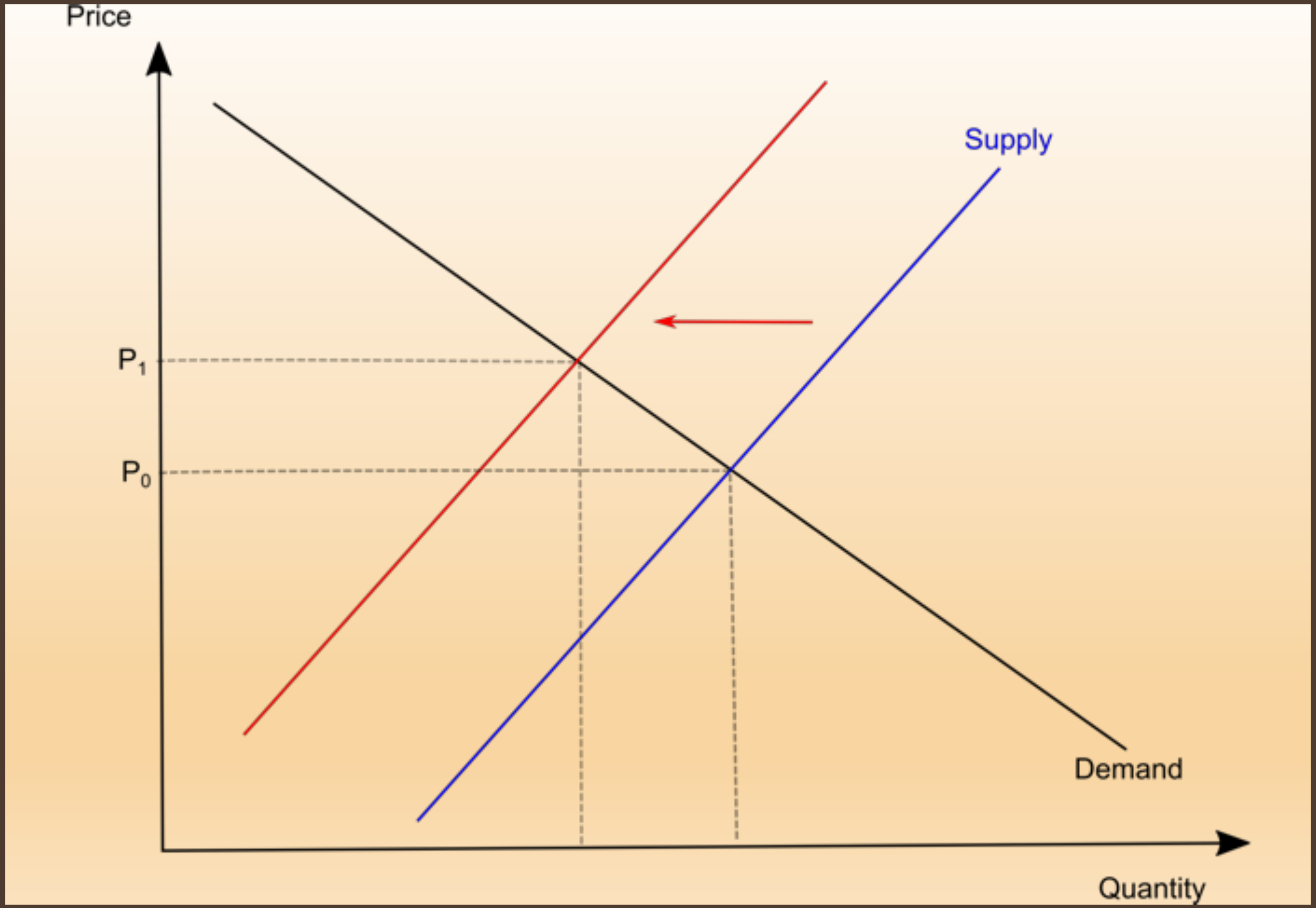
PRODUCT FORM

WHAT ABOUT HERE IN THE SOUTHEAST?

Want to keep in mind how futures contract specifications differ from local markets

For grains and oilseeds specifically:

- Low yield-price correlation
- Harvest timing
- Volatile yields
- Importing region



WHAT ABOUT HERE IN THE SOUTHEAST?

Producers may not be located close to futures delivery locations → basis values are significant to these producers

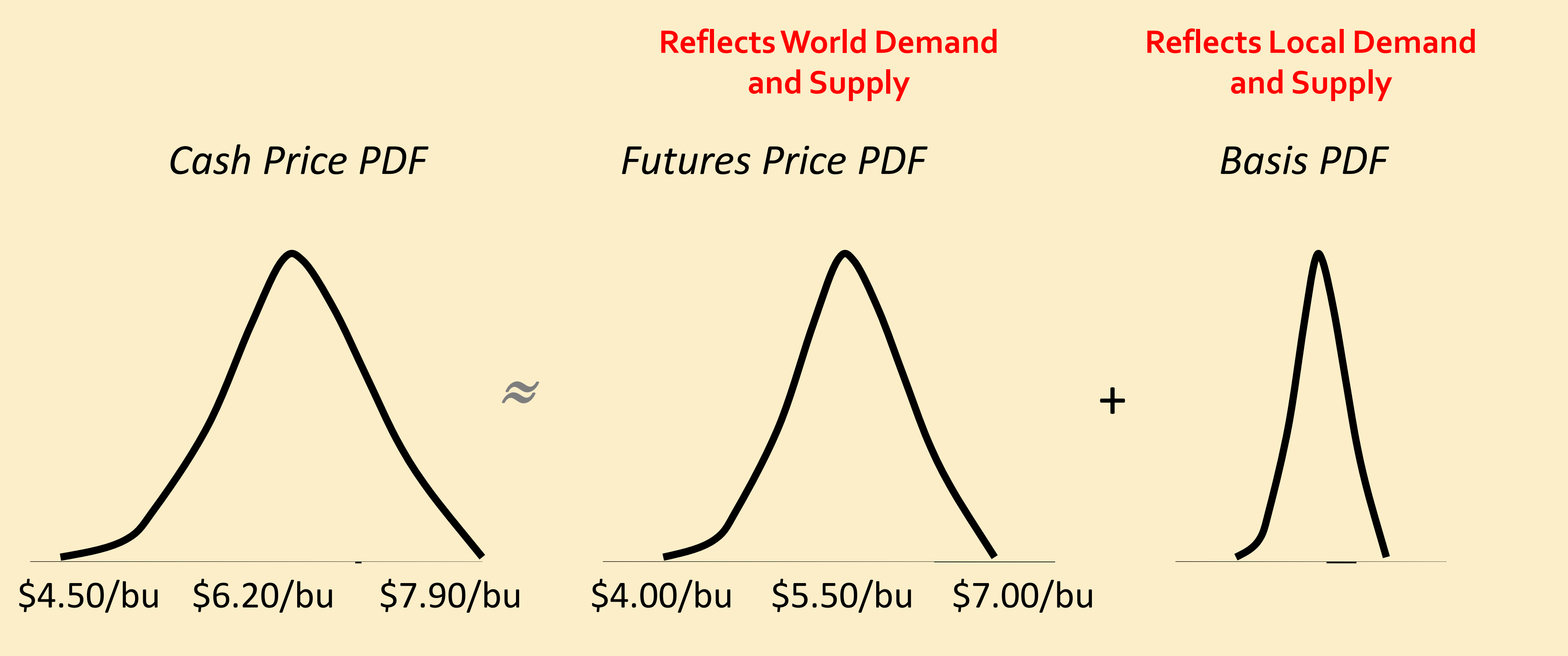
Basis: the principal measure for linking cash and futures prices for storable commodities

Basis = spot price – futures price

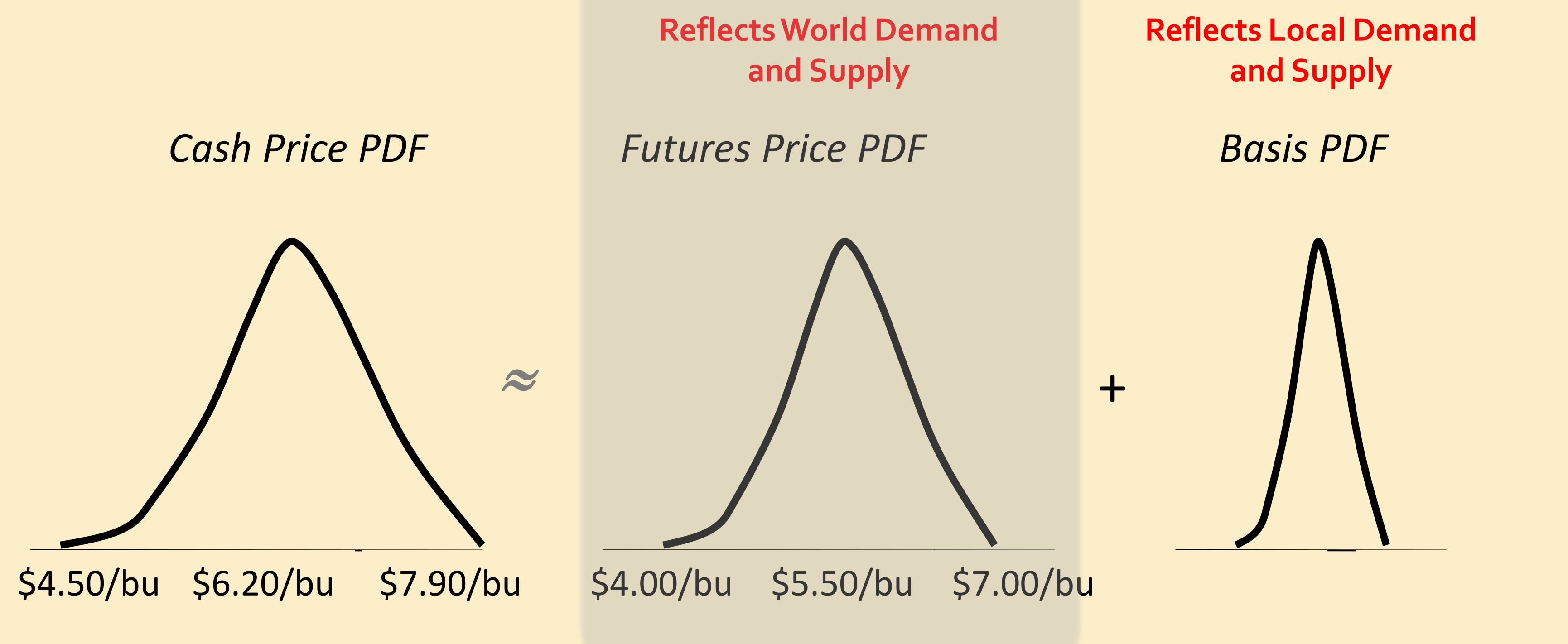
So,

Spot price = futures price + basis

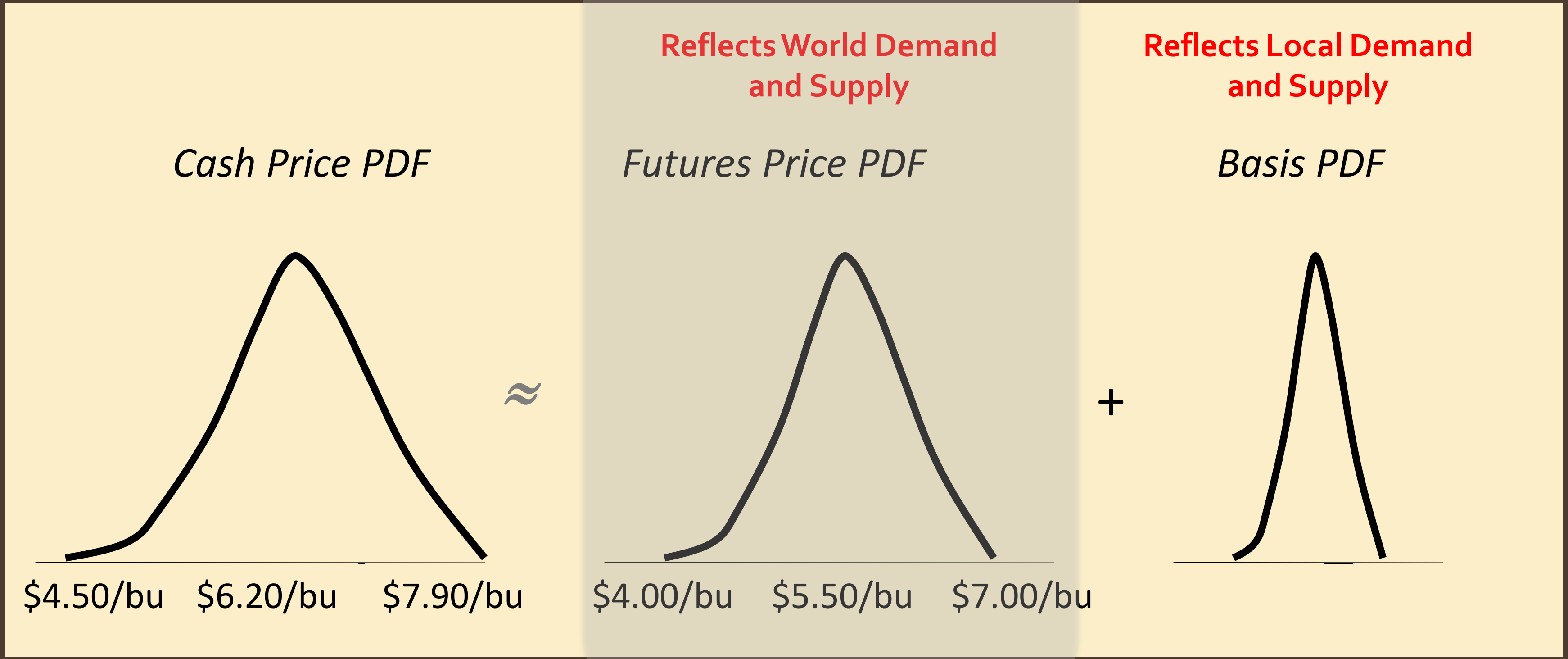
SPOT PRICE = FUTURES PRICE + BASIS



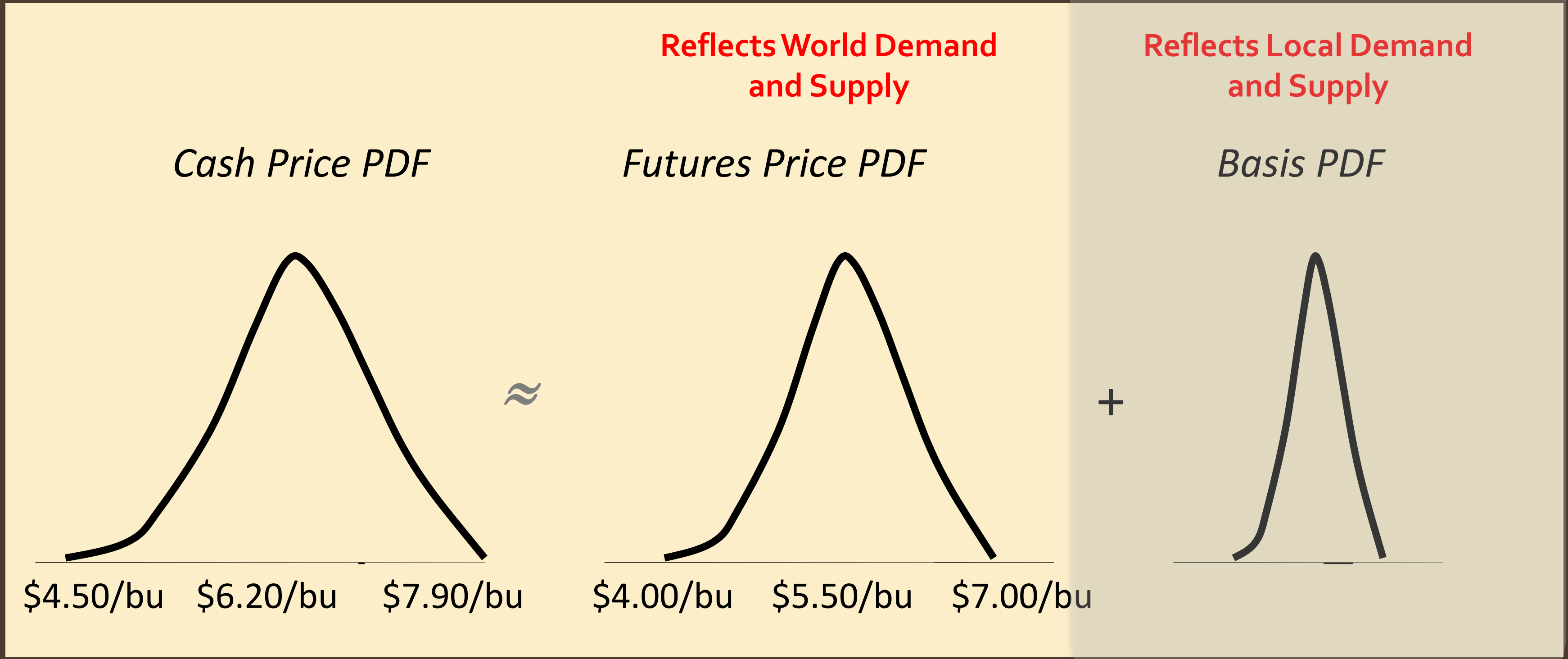
Global price risk can be hedged by participating in futures and options markets



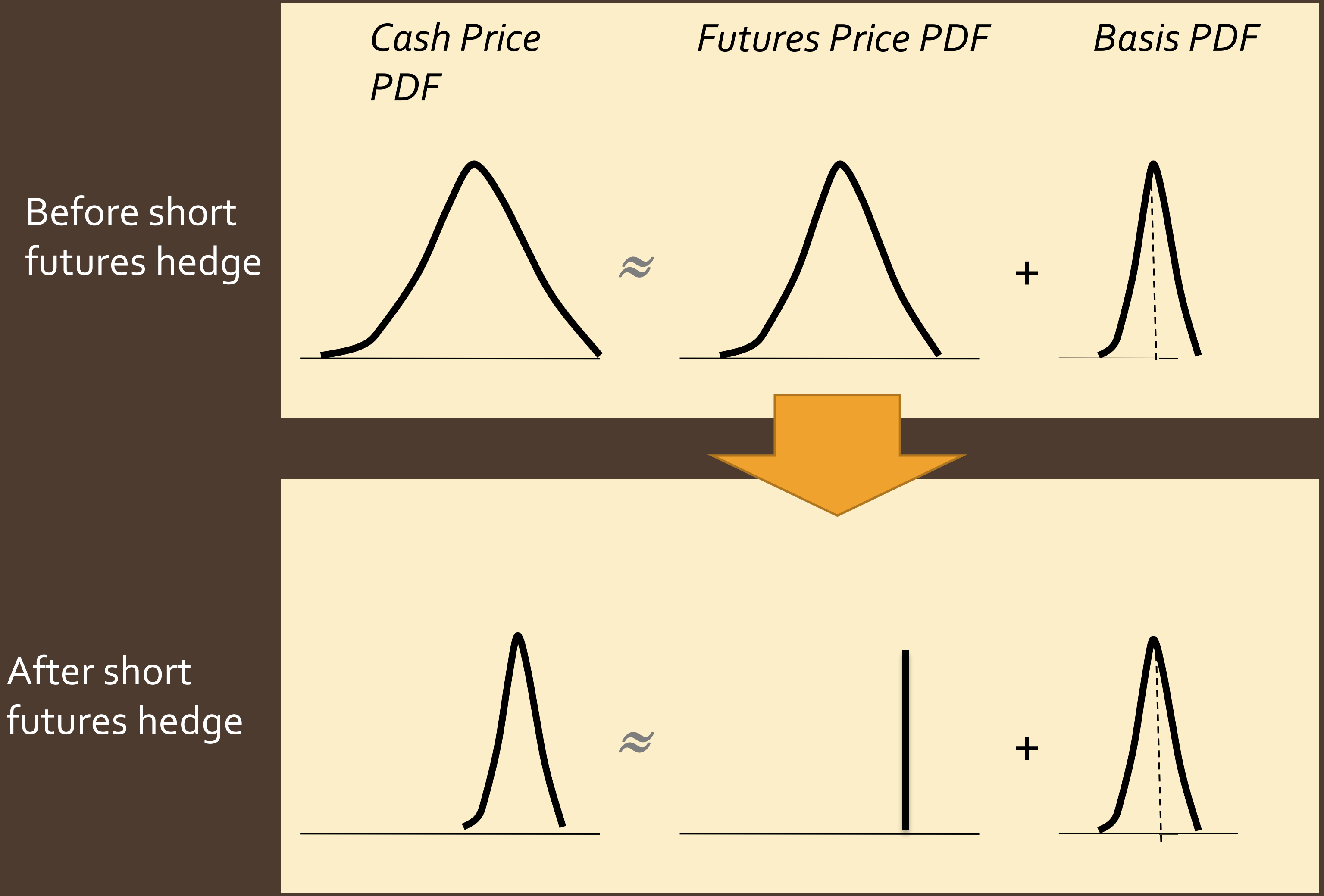
Local buyers often offer contracts that manage global price risk without directly participating in futures markets



Basis risk can be hedged by contracting with local buyers



STRATEGY FROM OUR EXAMPLE



MENU OF COMMON HEDGING TOOLS

Type	Main advantages	Main disadvantages
Short futures hedge	• Guaranteed to receive the established futures price + basis	• Still subject to basis risk • Can only hedge contract size increments • Margin calls
Buy a put option	• Establishes a floor on the futures price • No margin calls	• Still subject to basis risk • Can only establish a price floor for contract size increments
Forward price contract with local buyer	• Guaranteed price for all contracted production	• Cannot profit from additional gains in basis or futures
Basis forward contract with local buyer	• Basis is guaranteed for the contracted quantity • Can benefit from futures price increases	• Still subject to futures price risk

MENU OF COMMON HEDGING TOOLS: SUGGESTED STRATEGIES

Strong Basis

Basis Contract

Cash Forward Contract

Low Futures Price

High Futures Price

Do Nothing Now
Buy Put Option

Futures Hedge
Buy Put Option

Weak Basis

NOTES

My students often ask - why don't **ALL** farmers use these tools to hedge price risk?

- Hedging is not free
  - Buying & selling futures requires liquidity to meet **daily** margin requirements
  - Local contracts can have service fees or built-in risk premiums
- These tools only address price risk
  - Typical hedges represent 0-60% of expected production
- Active futures markets do not exist for all crops
- Contract sizes may be inappropriate
  - "minis" available for some commodities
- Numerous types of local contracts that have varying performance (volatility and average price) depending on market outcomes

RESOURCES

Local prices

- VA Dept. of Ag. https://www.vdacs.virginia.gov/markets-and-finance-market-news.shtml

National prices

- CME https://www.cmegroup.com/
- ICE https://www.theice.com/
- COINS @ VT https://www.coins.aaec.vt.edu/market-updates/

Marketing Education

- Comprehensive Risk Management Strategies: Putting it All Together https://cals.ncsu.edu/are-extension/educational-material/
  - Insurance information is outdated but other information is the same
- VA-specific https://ext.vt.edu/

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All photos are from the NC State PackPix database