

Basis Risk and (Cross) Hedging

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- Managing risk exposure
- Basis risk and the cross-hedge
- Avoiding basis risk
- Marketing plans and performance tracking

MANAGING RISK EXPOSURE

- Risk preferences vary across people
- How do growers limit production risk?
 - Crop insurance
 - Fertilizer/chemical application
 - Varietal selection
- How do we limit price risk?
 - Hedging
 - Forward contracting
 - Pray

- Sources of price risk (cash and futures)
 - Domestic markets
 - International markets
- Sources of basis risk
 - Cash price: local markets
 - Futures market: lack of convergence
- *None of these are under your control, so what can you do?*

- Sell cash at harvest
 - No margin calls or selling a crop that's 'not in the bin'
 - Exposed to ***price risk***
- Hedge your crop on the futures market
 - Limits downside price risk
 - Still exposed to ***basis risk*** and ***margin calls***
- Forward contract with a local elevator
 - No price risk, basis risk, or margin calls
 - Exposure to ***third party risk*** and ***risk premium***

BASIS RISK

- Basis defined

Cash Price – Nearby Futures Price = Basis

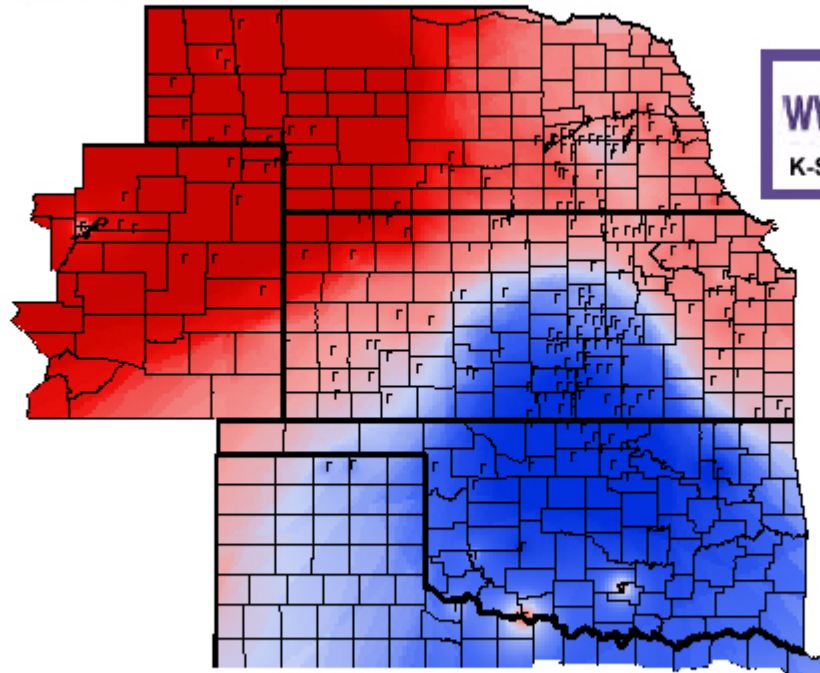
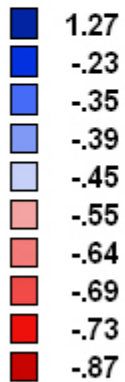
- Reflects costs of transporting to a terminal market
- Can be affected by local market conditions
 - Alternative uses: feedlots, bio-fuel plants
- Can vary over space and time

Wheat Basis, 10-05-2011

Basis = Cash Price - Nearby Futures Price

KCBT Dec
Futures
Price: \$7.00

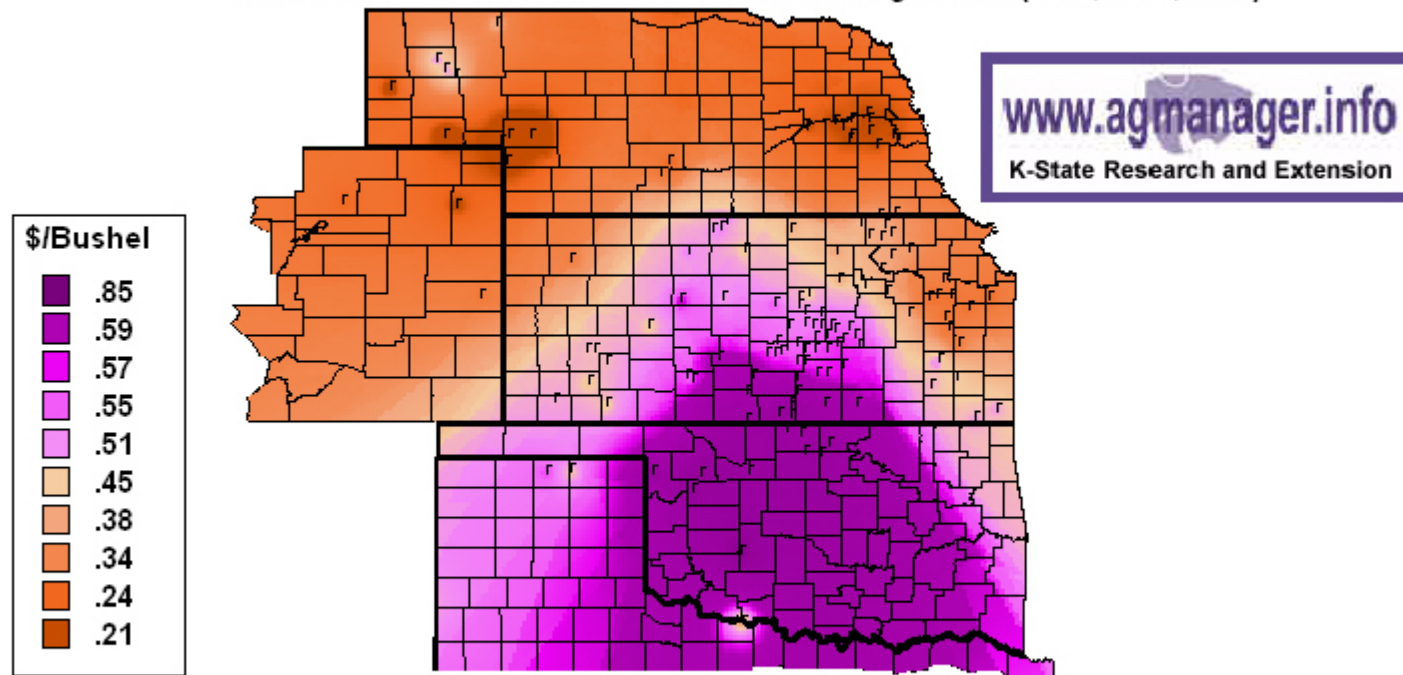
\$/Bushel



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Wheat Basis Deviation, 10-05-2011

Basis Deviation = Current Basis - 3 Year Average Basis (2008, 2009, 2010)



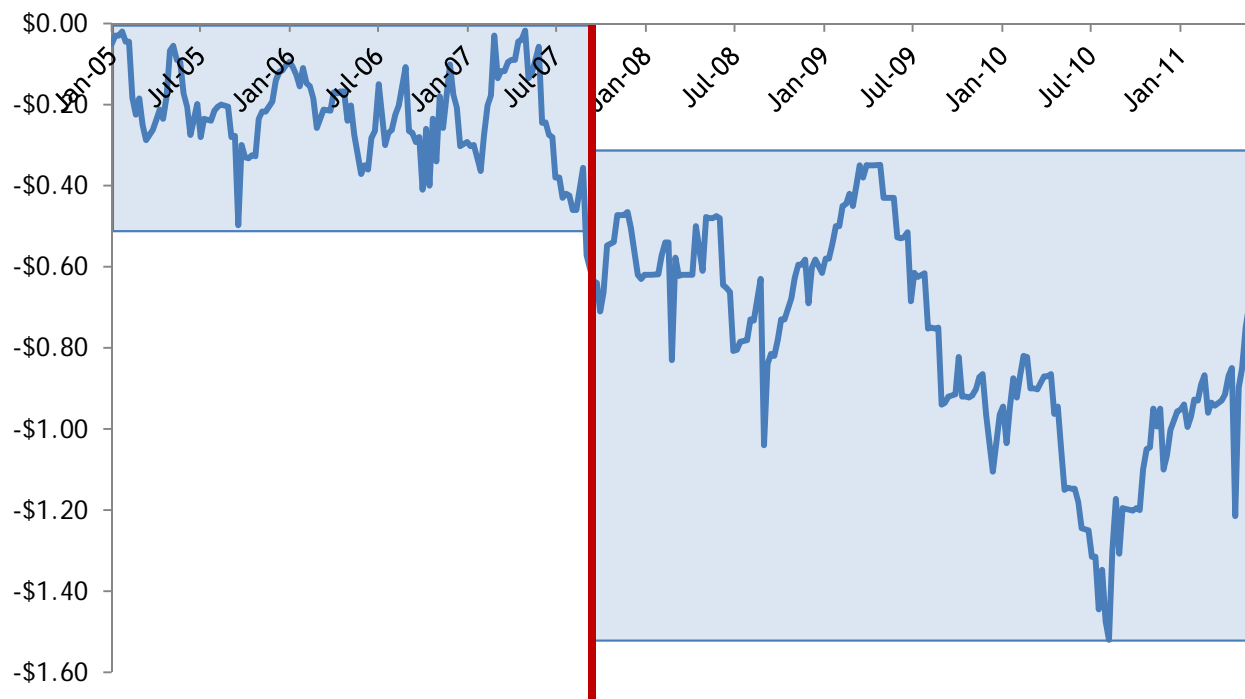
- “Every hedge is a cross-hedge”
 - Level of basis risk is a function of how close the cash and futures prices track
- HRW basis in Kansas
 - Tracks closely (especially with convergence)
 - Basis affected primarily by transportation costs
- Canola basis in Kansas
 - Doesn’t track Canadian canola board as closely
 - Additional risk exposure in currency market

- Hedging trades *price risk* for *basis risk*
 - Cash prices tend to be more volatile
 - Relative risk exposure is reduced
- Basis relationships for a given location tend to be stable over time:

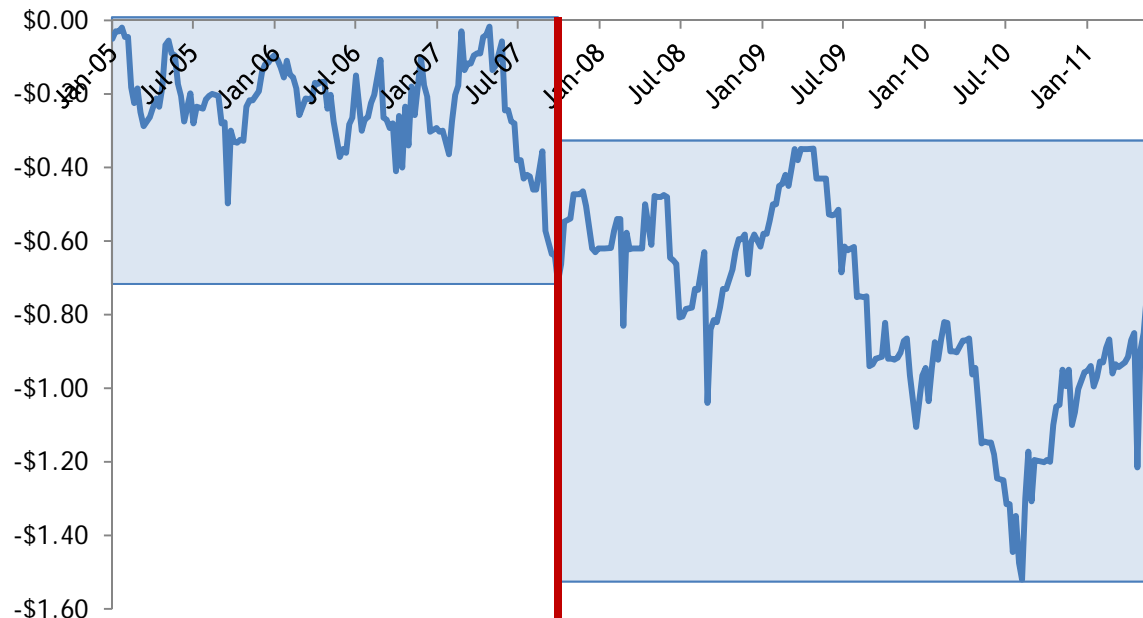
expected basis = actual basis

- Is this the case today?

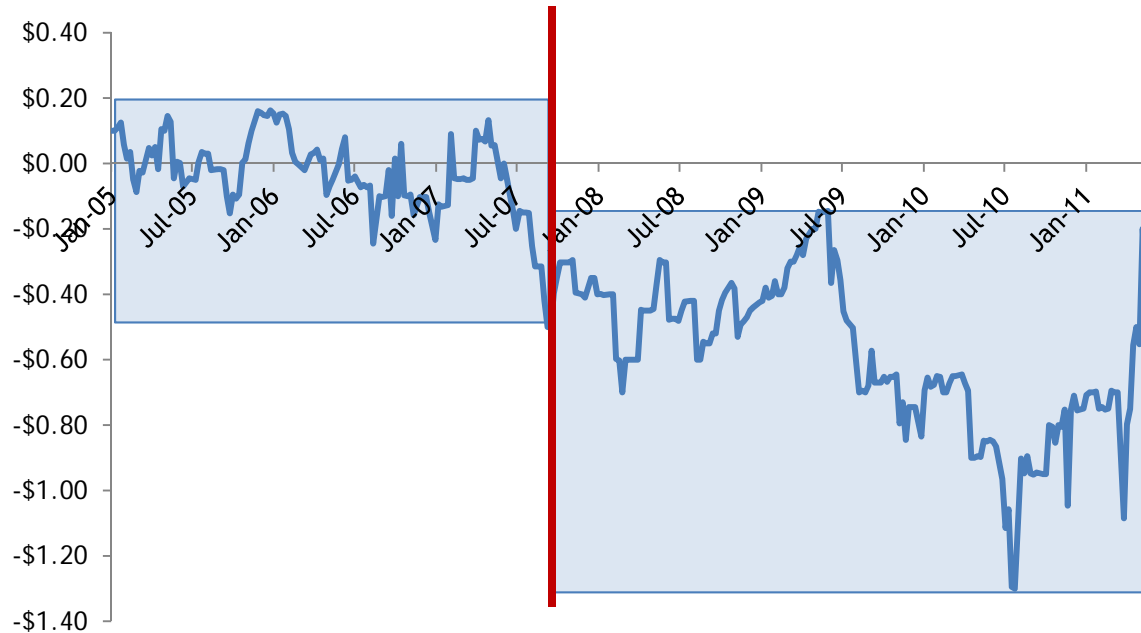
Beloit HRW Basis



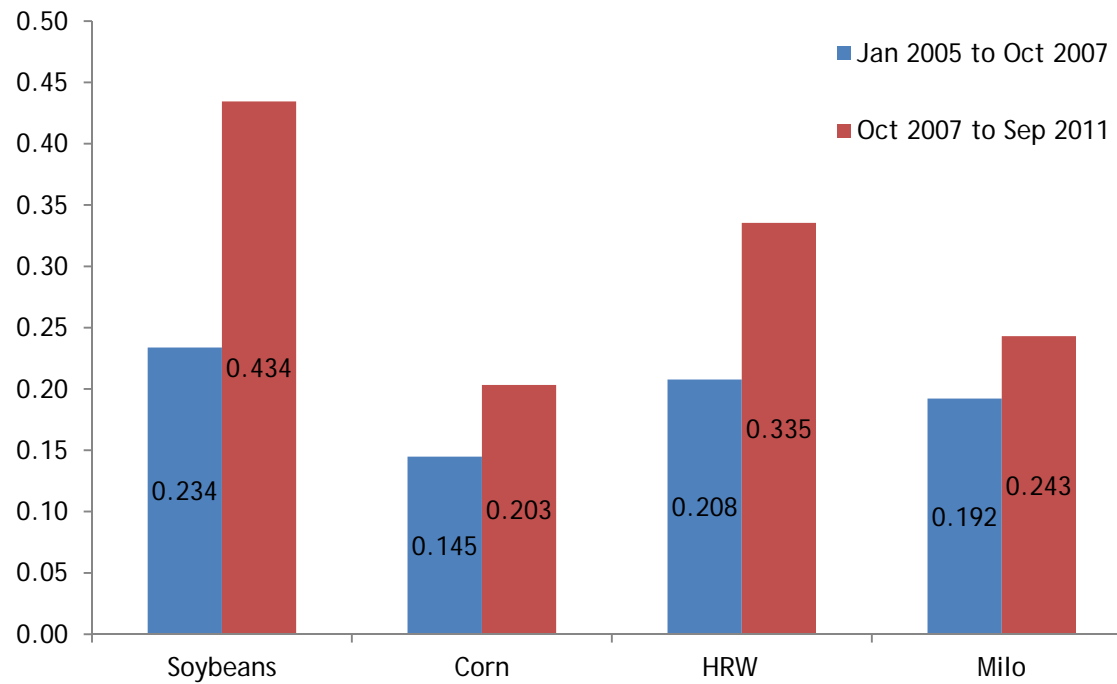
Garden City HRW Basis



Topeka HRW Basis



Standard Deviation



	KCBOT Settle		
	Price	KS Cash Price*	Basis
Average	6.08	5.52	-0.56
Minimum	3.15	2.81	-1.73
Maximum	13.37	13.03	0.25
Std. Deviation	2.05	1.92	0.39

* Cash price is an average of 6 KS locations: Beloit, Garden City, Goodland, Hutchinson, Pittsburg, and Topeka.

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- **Basis deviation is lower**
 - Less volatile than either cash or futures prices

- Example of new crop hedge
 - Sell a July wheat contract for some proportion of your expected wheat harvest
 - Size of contract not to exceed your estimated harvest
 - Take an offsetting position on that July contract prior to expiration
 - Calculate your actual price received

- Scenario 1
 - Price decrease at harvest

Date		Price Decrease
15-Feb	Sell July wheat contract	\$9.25/bu ←
1-Jul	Buy July wheat contract	\$8.85/bu ←
	Futures gain	+ \$0.40/bu ←
(Cash price = \$8.25)	Actual basis	- \$0.60/bu ←
	Commision costs	- \$0.02/bu ←
	Actual cash sale price	\$8.63/bu ←

Additional revenue = \$0.38/bu

- Scenario 2
 - Price increase at harvest

Date	Price Increase	
15-Feb	Sell July wheat contract	\$9.25/bu ←
1-Jul	Buy July wheat contract	\$9.65/bu ←
	Futures gain	- \$0.40/bu ←
(Cash price = \$9.05)	Actual basis	- \$0.60/bu ←
	Commision costs	- \$0.02/bu ←
	Actual cash sale price	\$8.63/bu ←

Additional revenue = \$0.00/bu

Cost of risk protection = \$0.42/bu

- The hedge worked in both markets
 - The actual price received was \$8.63/bu whether prices went up or down
 - Key to successful hedge

expected basis = actual basis

- What happens if basis moves?
 - More volatile markets suggest expected and actual basis may not be equal

- Scenario 3
 - Harvest price decrease, basis *widens*

Date		Price Decrease
15-Feb	Sell July wheat contract	\$9.25/bu ←
1-Jul	Buy July wheat contract	\$8.85/bu ←
	Futures gain	+ \$0.40/bu ←
(Cash price = \$7.75)	Actual basis	- \$1.10/bu ←
	Commision costs	- \$0.02/bu ←
	Actual cash sale price	\$8.13/bu ←

- Not a complete hedge, lost \$.50/bu to ***basis risk***

- Depending on the direction of a change in basis, you can benefit or lose
 - Basis widens: lose money
 - Basis narrows: gain money
- Is this a level of variability you can live with?
- If not, what are your other marketing options?
 - Forward contracting

- Alternative to hedging
- Eliminates downside price risk and basis risk
 - No commission costs or margin calls
 - Fewer transaction costs (paperwork, time)
- Exposes you to ***third party risk*** and a ***risk premium***

- Cost of risk management
 - Elevators will charge you a premium for accepting your price risk
 - Expect this cost to increase as basis risk increases
 - New crop bids and cash prices tend to converge as harvest nears

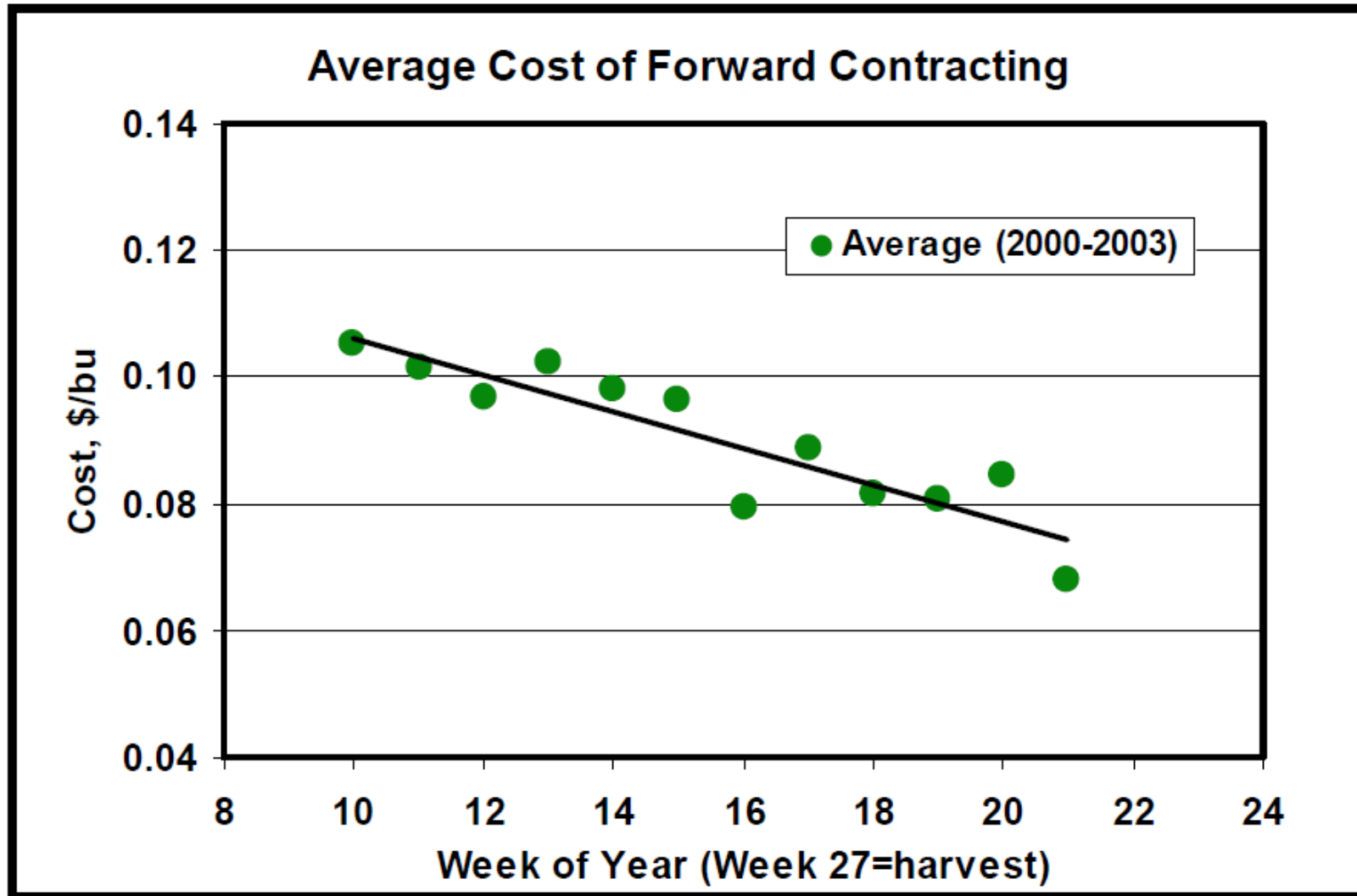
- Previous research
 - K-State and U of Illinois studies
 - Looked at cost of forward contracting in Kansas
 - Four to fourteen years of data
 - Findings
 - Risk premium for declines as approach harvest
 - Suggests that as more information is available, basis risk declines

Sources:

Taylor, M., K. Dhuyvetter, and T. Kastens. 2003. "Hedging vs. Forward Contracting for Wheat."

http://www.agmanager.info/marketing/publications/marketing/forward_contracting_wheat.pdf

Shi, W., S. Irwin, D. Good, and S. Dietz. 2005. "Wheat Forward Contract Pricing: Evidence on Forecast Power and Risk Premia." <http://ageconsearch.umn.edu/handle/19043>



- Further research
 - Data used in studies are ‘old’ and don’t include current levels of risk
 - Are the elevators any better at forecasting basis?
 - Determine the relationship between the risk premium and the basis variability
 - How much is ‘too much’?
 - When do the elevators stop offering forward contracts?

MARKETING PLANS

- Together the tools we have discussed can comprise a **marketing plan**
- Plans can take a portfolio approach
 - Use some combination of tools to diversify risk exposure
- Tracking and evaluating performance
 - Over several years to know if it is working

- Track your progress
 - Data collection over time will help you evaluate your marketing plan
 - If you encounter Scenario 2 and ‘miss out’ on a harvest time price increase, are you going to hedge next year?
 - What is your 3, 4, & 5 year average price under a marketing plan?
 - How does it compare to selling cash at harvest or paying the risk premium for a forward contract?

- Basis risk is higher today, but so is price risk
 - Relative exposure still matters
 - Everyone facing the same volatility in the markets
- Marketing plans and tracking performance more important than ever
 - Is hindsight 20/20 if you never look back?
 - Are you making marketing decisions using solid information or knee-jerk responses?

Questions?

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