ARE 415: Introduction to Commodity Futures Markets

Lecture 8: Using Basis to Make Informed Decisions

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Marketing Options in Commodity Markets

- In your assigned reading "A Guide to Price-Risk Management in Grain Marketing for NC, SC, & GA" by Piggott, Shumaker, and Curtis pg. 25-53 you should have learned that there are five basic contracts available for marketing (http://www4.ncsu.edu/unity/lockers/users/n/nick/basis_piggott_shumaker_curtis.pdf)
- Lets review the different contracts:

1) **Cash contract:** Seller agrees to deliver immediately a specific quantity of a commodity for an agreed upon price;
2) **Forward contract:** Two parties agree to a transaction in the future which includes a specific quantity of a commodity for an agreed upon price and delivery date;
3) **Basis contract:** Similar to 2) except the price to be paid at delivery is based on the current price of the futures price named in the contract at delivery + basis amount specified in the contract. So actual price remains open due to changes in futures;
4) **Futures contract:** Is a forward contract but it rarely involves actual delivery, is traded on an exchange, and involves standard terms. Can easily be offset by taking an opposite position as the original contract. Subject to margin calls;
5) **Put Option**: Like a futures contract is traded on exchange and is standardized. Option holder pays a premium to sell (put) or buy (call) a futures contract to the option writer within a specified time period for a set price referred to as the strike price.

USING BASIS TO MAKE INFORMED RISK MANAGEMENT DECISIONS

- **Think of futures market prices for a commodity as a measure of the *expected U.S. and World supply & demand* situation.**

- **When prices are "high" – expected demand is *greater* than expected supply.**

- **When prices are "low" – expected supply is *greater* than expected demand.**

NEARBY FUTURES PRICE

- **The contract closest to expiration**
- **Measures the current U.S. and World Supply & Demand situation**
- **Forms the standard in the world market that all pricing is based upon**

BASIS

- **Reflects the local supply and demand situation.**
  - **Concept of relativity to historical levels at the same time of previous years**
- **When basis is strong (relative to historical levels) local *demand* is greater than local *supply***
- **When basis is weak (relative to historical levels) local *supply* is greater than local *demand***

USING BASIS TO GUAGE CASH BIDS

- **Assuming no major changes in the local market at some point in time *t* in the year, then the following *should be* pretty close for any given market:**

Current Cash Bid$_t$ = Nearby Futures$_t$ + Historical Basis$_t$

USING BASIS TO GUAGE CASH BIDS

However, when:

Current Cash Bid is *above* the expected, then the basis is considered *strong* and the bid is "attractive"

And when:

Current Cash Bid is *below* the expected, then the basis is *weak* and the bid is "unattractive"

USING BASIS TO EVALUATE OFFERS

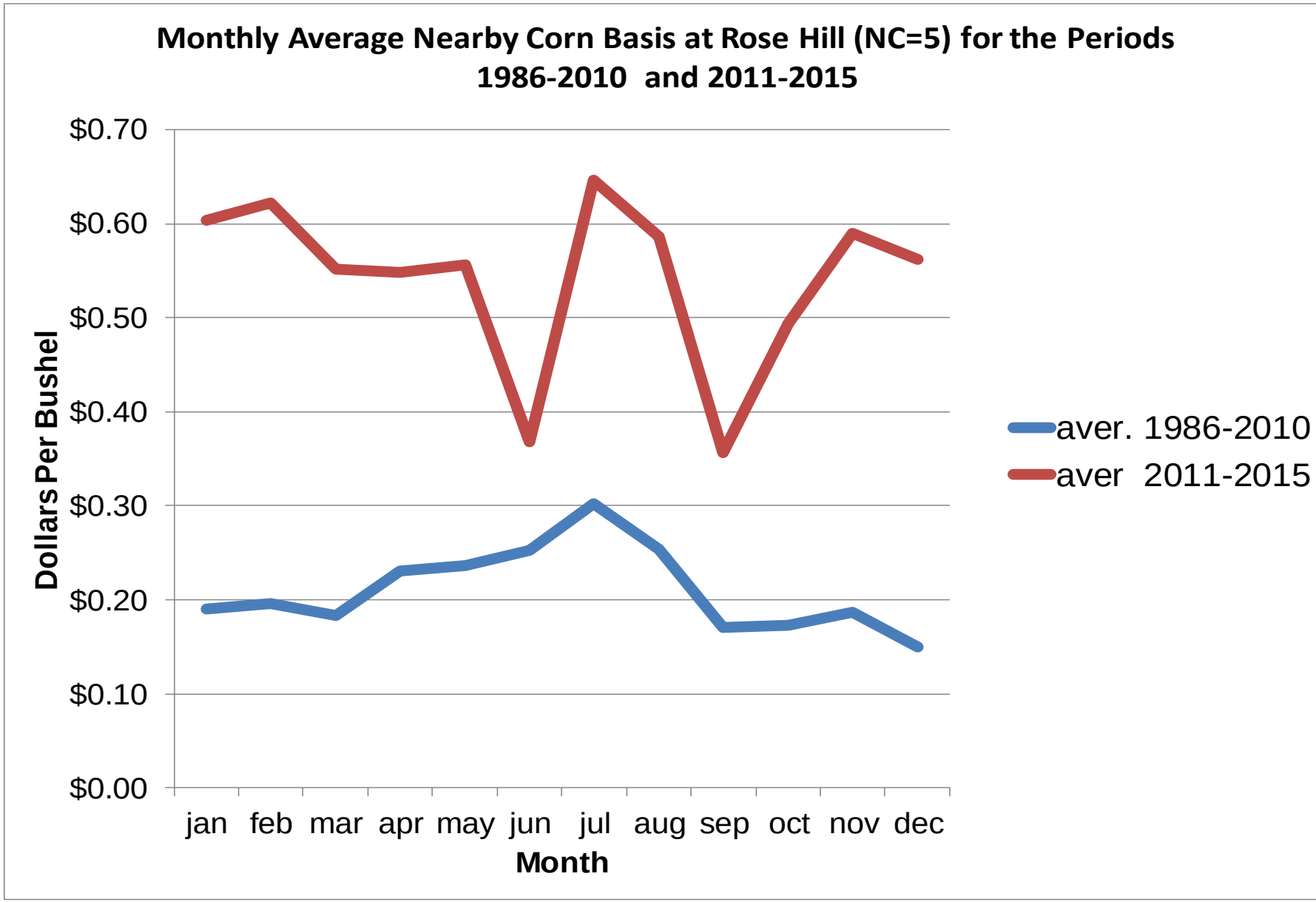
- **Dundee Downs is a farm located close to Rosehill, NC and is farmed by Mick.**
  - **500 acres of corn and soybean production**
  - **Storage capacity of 50,000 bushels**
  - **Mick has been tracking corn basis at the Rosehill elevator for 10 years and has calculated a nearby month average basis for corn based on daily data.**
  - **Lets evaluate some scenarios for marketing Mick's corn**

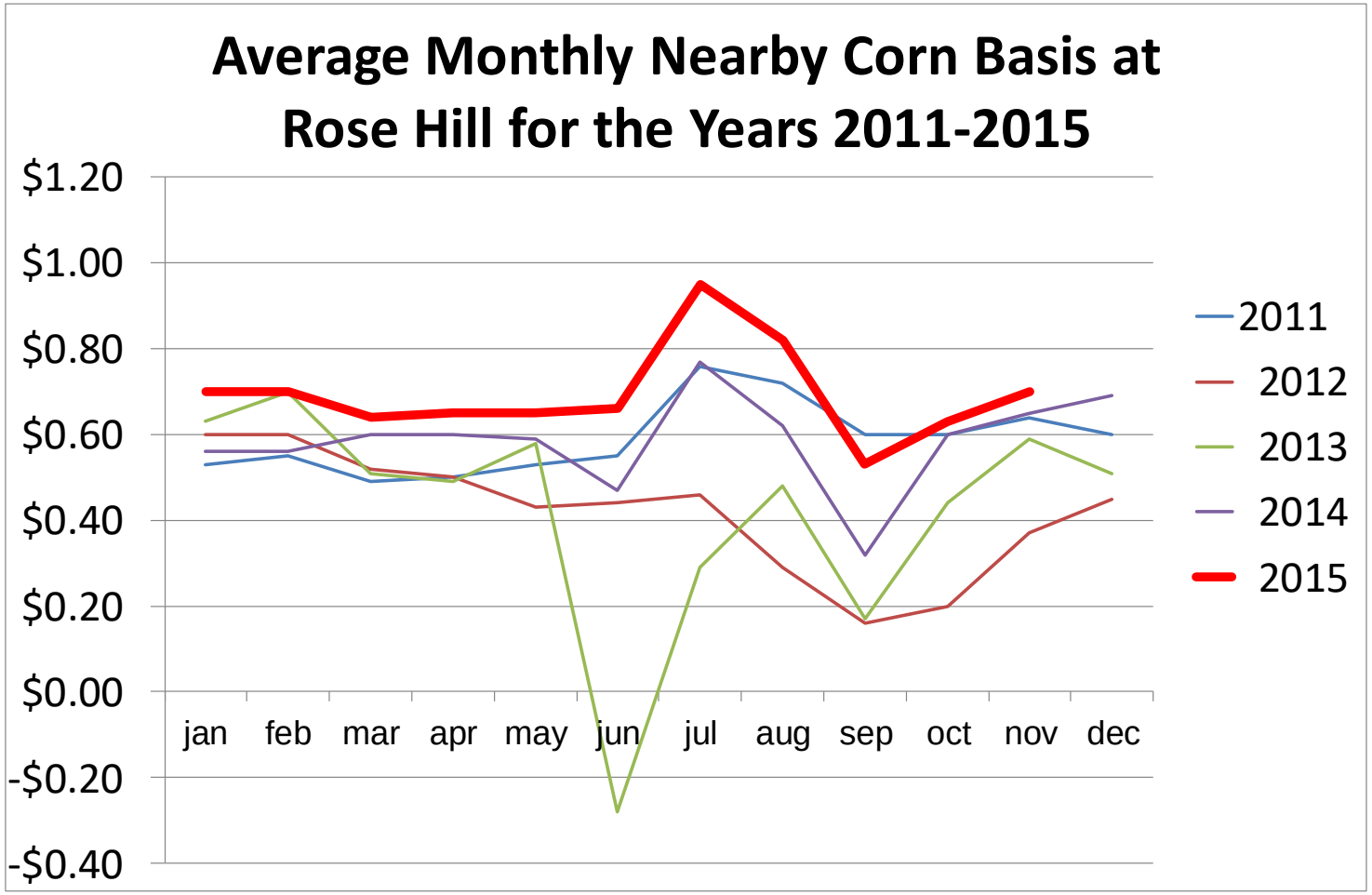
Farmer Mick from Dundee Downs

http://variety.com/2018/tv/news/best-super-bowl-commercials-2018-1202684988/

Corn Basis Rose Hill 1986-2015

year	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	ANN
1986	$0.34	$0.33	$0.26	$0.31	$0.44	$0.45	$0.63	$0.30	$0.03	$0.07	$0.04	$0.05	**$0.28**
1987	$0.13	$0.25	$0.22	$0.20	$0.09	$0.10	$0.19	$0.17	$0.06	$0.10	$0.10	$0.04	**$0.14**
1988	$0.00	-$0.02	-$0.05	$0.01	-$0.04	-$0.08	-$0.07	$0.01	$0.03	$0.17	$0.14	$0.08	**$0.01**
1989	$0.10	$0.10	$0.07	$0.09	$0.15	$0.27	$0.38	$0.31	$0.21	$0.19	$0.20	$0.15	**$0.18**
1990	$0.13	$0.17	$0.08	-$0.03	$0.01	-$0.08	$0.20	$0.19	$0.25	$0.24	$0.23	$0.16	**$0.12**
1991	$0.17	$0.10	$0.00	$0.04	$0.21	$0.12	$0.20	$0.11	$0.00	$0.02	$0.11	$0.09	**$0.10**
1992	$0.05	$0.11	$0.08	$0.22	$0.17	$0.27	$0.27	$0.24	$0.20	$0.16	$0.13	$0.07	**$0.16**
1993	$0.15	$0.16	$0.12	$0.20	$0.17	$0.31	$0.24	$0.26	$0.24	$0.25	$0.17	$0.09	**$0.19**
1994	$0.14	$0.13	$0.08	$0.16	$0.14	$0.09	$0.28	$0.23	$0.20	$0.20	$0.20	$0.09	**$0.16**
1995	$0.08	$0.04	$0.03	$0.17	$0.16	$0.09	$0.12	$0.17	$0.17	$0.14	$0.15	$0.11	**$0.12**
1996	$0.29	$0.30	$0.30	$0.40	$0.40	$0.39	$1.01	$0.53	$0.70	$0.52	$0.35	$0.25	**$0.46**
1997	$0.25	$0.25	$0.25	$0.22	$0.23	$0.29	$0.32	$0.29	$0.29	$0.25	$0.25	$0.15	**$0.25**
1998	$0.25	$0.25	$0.21	$0.25	$0.30	$0.34	$0.31	$0.34	$0.16	$0.15	$0.15	$0.08	**$0.23**
1999	$0.15	$0.16	$0.36	$0.45	$0.38	$0.37	$0.35	$0.25	$0.06	$0.15	$0.12	$0.07	**$0.24**
2000	$0.24	$0.16	$0.13	$0.20	$0.16	$0.20	$0.17	$0.22	$0.03	$0.00	$0.00	-$0.07	**$0.13**
2001	-$0.03	$0.00	$0.06	$0.20	$0.17	$0.20	$0.16	$0.16	-$0.03	-$0.05	-$0.05	-$0.14	**$0.06**
2002	-$0.07	-$0.05	-$0.08	-$0.05	-$0.08	-$0.05	-$0.08	$0.21	$0.25	$0.25	$0.25	$0.21	**$0.06**
2003	$0.20	$0.20	$0.48	$0.54	$0.56	$0.55	$0.50	$0.30	$0.16	$0.10	$0.10	$0.10	**$0.32**
2004	$0.12	$0.09	$0.06	$0.10	$0.08	$0.09	$0.08	$0.20	$0.10	$0.10	$0.10	$0.04	**$0.10**
2005	$0.10	$0.10	$0.03	$0.05				$0.24	$0.10	$0.10	$0.17	$0.39	**$0.14**
2006	$0.40	$0.40	$0.33	$0.36	$0.24	$0.29	$0.30	$0.30	$0.00	$0.09	$0.17	$0.23	**$0.26**
2007	$0.30	$0.30	$0.20	$0.22	$0.27	$0.40		$0.27	$0.10	$0.17	$0.39	$0.38	**$0.27**
2008	$0.38	$0.40	$0.32	$0.31	$0.31	$0.35	$0.31	$0.23	$0.15	$0.11	$0.30	$0.33	**$0.29**
2009	$0.27	$0.45	$0.60	$0.59	$0.64	$0.55	$0.54		$0.41	$0.48	$0.46	$0.39	**$0.48**
2010	$0.60	$0.51	$0.45	$0.55	$0.51	$0.55	$0.54	$0.57	$0.39	$0.35	$0.44	$0.41	**$0.49**
2011	$0.53	$0.55	$0.49	$0.50	$0.53	$0.55	$0.76	$0.72	$0.60	$0.60	$0.64	$0.60	**$0.59**
2012	$0.60	$0.60	$0.52	$0.50	$0.43	$0.44	$0.46	$0.29	$0.16	$0.20	$0.37	$0.45	**$0.42**
2013	$0.63	$0.70	$0.51	$0.49	$0.58	-$0.28	$0.29	$0.48	$0.17	$0.44	$0.59	$0.51	**$0.43**
2014	$0.56	$0.56	$0.60	$0.60	$0.59	$0.47	$0.77	$0.62	$0.32	$0.60	$0.65	$0.69	**$0.58**
2015	$0.70	$0.70	$0.64	$0.65	$0.65	$0.66	$0.95	$0.82	$0.53	$0.63	$0.70		**$0.69**
MIN	-$0.07	-$0.05	-$0.08	-$0.05	-$0.08	-$0.28	-$0.08	$0.01	-$0.03	-$0.05	-$0.05	-$0.14	**$0.01**
MAX	$0.70	$0.70	$0.64	$0.65	$0.65	$0.66	$1.01	$0.82	$0.70	$0.63	$0.70	$0.69	**$0.69**
MEAN	$0.26	$0.27	$0.25	$0.28	$0.29	$0.27	$0.37	$0.30	$0.20	$0.22	$0.25	$0.21	**$0.26**
aver. 1986-2010	$0.19	$0.20	$0.18	$0.23	$0.24	$0.25	$0.30	$0.25	$0.17	$0.17	$0.19	$0.15	**$0.21**
aver 2011-2015	$0.60	$0.62	$0.55	$0.55	$0.56	$0.37	$0.65	$0.59	$0.36	$0.49	$0.59	$0.56	**$0.54**


Monthly Average Nearby Corn Basis at Rose Hill (NC=5) for the Periods 1986-2010 and 2011-2015
$0.70
$0.60
$0.50
$0.40
$0.30
$0.20
$0.10
$0.00
Dollars Per Bushel
jan feb mar apr may jun jul aug sep oct nov dec
Month
aver. 1986-2010
aver 2011-2015


Average Monthly Nearby Corn Basis at Rose Hill for the Years 2011-2015
$1.20
$1.00
$0.80
$0.60
$0.40
$0.20
$0.00
-$0.20
-$0.40
jan
feb
mar
apr
may
jun
jul
aug
sep
oct
nov
dec
2011
2012
2013
2014
2015

USING BASIS TO GUAGE CASH BIDS

An Example: Elevator in Rosehill is offering a cash bid for immediate March delivery of corn for $4.25, the nearby futures contract is $3.50 [considered a good futures price given recent months & outlook], meaning the offer contains a basis of $0.75 *over* the nearby futures

- **Mick's records show historical basis has averaged $0.55 *over* the nearby contract in March over the past 5 years.**
- **So, this is an "*attractive*" bid with a very "*strong*" basis being $0.20 higher than the average. Mick should sell some of his corn at this price and so he sells the remaining old crop corn he had in the bin using a cash contract.**

Historical Basis to Gauge Bid

Nearby Corn Basis Rose Hill 2011-2015

year	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	ANN
2011	$0.53	$0.55	$0.49	$0.50	$0.53	$0.55	$0.76	$0.72	$0.60	$0.60	$0.64	$0.60	**$0.59**
2012	$0.60	$0.60	$0.52	$0.50	$0.43	$0.44	$0.46	$0.29	$0.16	$0.20	$0.37	$0.45	**$0.42**
2013	$0.63	$0.70	$0.51	$0.49	$0.58	-$0.28	$0.29	$0.48	$0.17	$0.44	$0.59	$0.51	**$0.43**
2014	$0.56	$0.56	$0.60	$0.60	$0.59	$0.47	$0.77	$0.62	$0.32	$0.60	$0.65	$0.69	**$0.58**
2015	$0.70	$0.70	$0.64	$0.65	$0.65	$0.66	$0.95	$0.82	$0.53	$0.63	$0.70		**$0.69**
MEAN	**$0.60**	**$0.62**	**$0.55**	**$0.55**	**$0.56**	**$0.37**	**$0.65**	**$0.59**	**$0.36**	**$0.49**	**$0.59**	**$0.56**	**$0.54**

USING BASIS TO EVALUATE CASH FORWARD PRICE BIDS

Just as we can evaluate current cash bids by using the historical basis, we can also do the same for *cash forward price bids* for harvest delivery:

Rough rule of thumb:

Cash Forward Price Bid = Harvest Contract Futures Price + Historical Basis at Harvest

USING BASIS TO EVALUATE CASH FORWARD PRICE BIDS

However, when:

Cash Forward Price Bid is *above* the expected, then the basis is considered *strong* and the bid is "*attractive*"

And when:

Cash Forward Price Bid is *below* the expected, then the basis is *weak* and the bid is "unattractive"

USING BASIS TO EVALUATE CASH FORWARD PRICE BIDS

An Example: Mick is interested in fixing his corn price in June when December corn futures (CZ) are at $4.50 [*he thinks CZ @ $4.50 is a potential opportunity*] for delivery in October. The elevator in Rosehill is offering a cash forward price contract bid of $4.80 for October delivery.

Is this an attractive bid?

(Hint: What is the historical basis for October?)

USING BASIS TO EVALUATE CASH FORWARD PRICE BIDS

Evaluation: **The historical basis in that market area for October delivery was an average of $0.49 *over* the December futures contract over the last 5 years.**

- **The implied basis on offer is $0.30 *over* ($4.80-$4.50) and would be considered "*weak*" and thus the bid would be considered "*unattractive*". The current offer is $0.19 less than the average compared to previously so Mick choses *not* to forward contract any corn.**
  - **In doing so he has not eliminated any price risk and instead is waiting for a better opportunity.**
  - **Is Mick making the correct decision? What else might he do?**

Nearby Corn Basis Rose Hill 2011-2015

year	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	ANN
2011	$0.53	$0.55	$0.49	$0.50	$0.53	$0.55	$0.76	$0.72	$0.60	$0.60	$0.64	$0.60	$0.59
2012	$0.60	$0.60	$0.52	$0.50	$0.43	$0.44	$0.46	$0.29	$0.16	$0.20	$0.37	$0.45	$0.42
2013	$0.63	$0.70	$0.51	$0.49	$0.58	-$0.28	$0.29	$0.48	$0.17	$0.44	$0.59	$0.51	$0.43
2014	$0.56	$0.56	$0.60	$0.60	$0.59	$0.47	$0.77	$0.62	$0.32	$0.60	$0.65	$0.69	$0.58
2015	$0.70	$0.70	$0.64	$0.65	$0.65	$0.66	$0.95	$0.82	$0.53	$0.63	$0.70		$0.69
MEAN	**$0.60**	**$0.62**	**$0.55**	**$0.55**	**$0.56**	**$0.37**	**$0.65**	**$0.59**	**$0.36**	**$0.49**	**$0.59**	**$0.56**	**$0.54**

USING BASIS TO DECIDE WHETHER OR NOT TO HEDGE

Hedging **eliminates** ***futures price*** **risk while maintaining** ***basis*** **risk.**

To be successful, basis risk ***must be less*** **than futures price risk.**

USING BASIS TO DECIDE WHETHER OR NOT TO HEDGE

Example: Assume new crop corn futures of $4.50 and historical basis of $0.49 *over* yielding an expected new crop cash price of $4.99. However,

- **If basis were to vary by 100% ($0.49), the new crop cash price would vary from $4.50 to $5.48, a range of $0.98.**
- **If futures prices were to vary by only 30% ($1.35), cash prices would vary from $3.15 to $5.85, a range of $2.70.**

Lesson: A small % change in futures can cause a greater change on expected cash prices compared with a large % change in the basis.

USING BASIS TO DECIDE WHETHER OR NOT TO HEDGE

Example: Mick is deciding between hedging or cash forward contracting his crop in June when CZ @ $4.50 for delivery in October. The Rosehill elevator is offering a cash forward price contract bid of $4.80 for October delivery.

- Cash forward basis is $0.30 *over* while the historical basis has been $0.49 *over* so we have correctly rejected forward price contract
- However, we have an attractive new crop futures price how can Mick take advantage of the situation to eliminate some price risk?
- Pass on the forward contract but still lock in the attractive futures with a hedge using futures (or put option) with the expectation the basis will recover to historical levels as we move closer to harvest.
  - Why would we expect basis to possibly recover to historical levels over time as we get closer to harvest?

USING BASIS TO DECIDE WHETHER OR NOT TO HEDGE

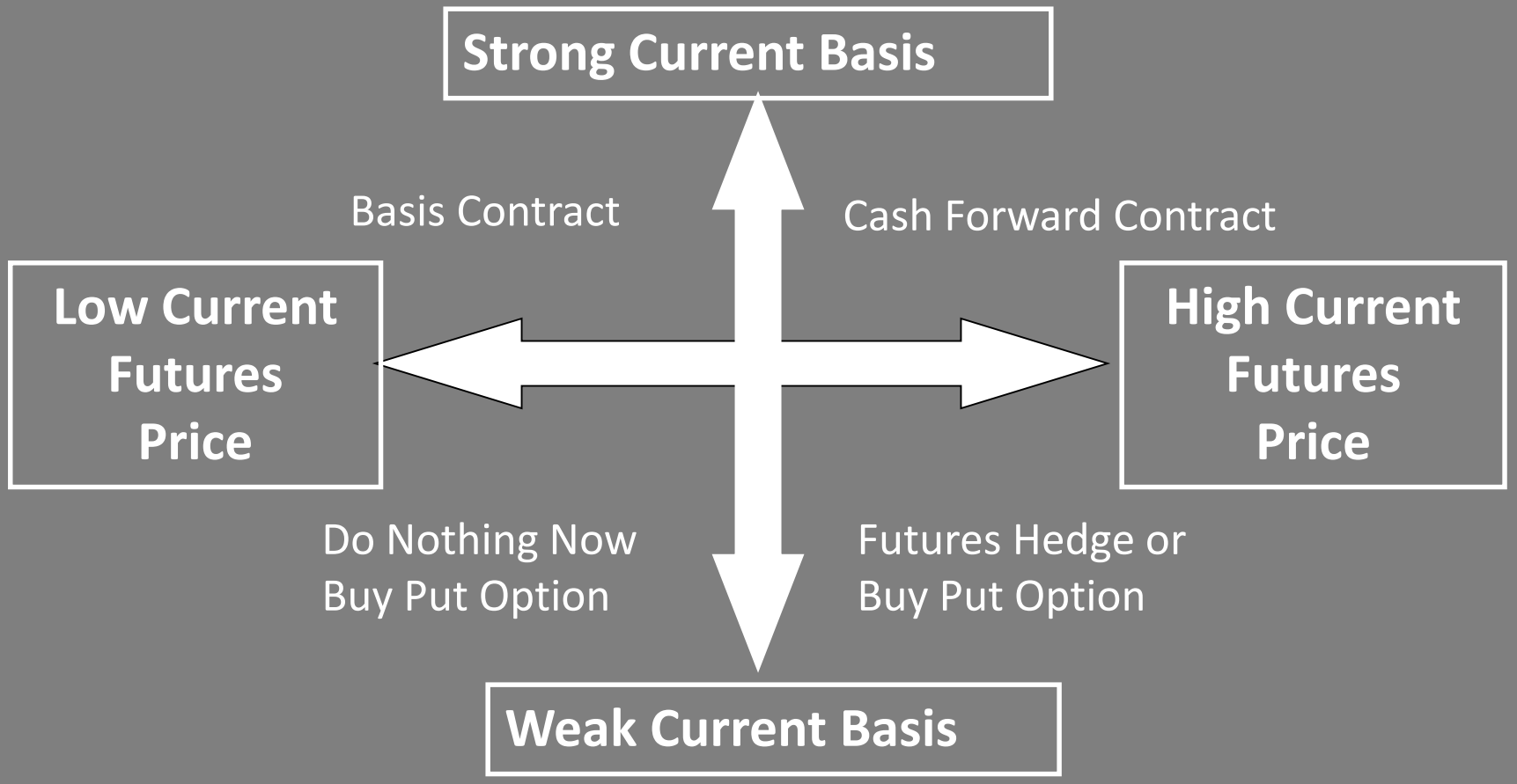
Example: Mick is deciding between hedging or cash forward contracting his crop in June when December futures are at $4.50 for delivery in October. The Rosehill elevator is offering a cash forward price contract bid of $5.25 for October delivery.

- Cash forward contract basis is $0.75 *over* ($5.25-$4.50) with the historical basis being $0.49 *over* in October
- We now have an attractive futures price and a strong basis on offer with cash forward contract.
- So pull the trigger on cash forward contract and simultaneously eliminate price and basis risk.
  - Why would Rosehill be making such an offer in June for October delivery?
  - What is their expectation on the local supply and demand at harvest?

MARKETING STRATEGIES AND THE IMPACT UPON FUTURES PRICE AND BASIS RISKS

Marketing Strategies	*Futures Price Risk*	*Basis Risk*
Cash Sale at Harvest	Yes	Yes
Cash Forward Contract	No	No
Basis Contract	Yes	No
Futures Hedge	No	Yes
Options Hedge (Put)	No	Yes

RECOMMENDED MARKETING STRATEGIES FOR DIFFERENT FUTURES PRICE AND BASIS RISK SITUATIONS



Key Points for Strategies

- Marketing strategies with the exception of forward contracting are subject to basis risk.
- Know your historical basis and look for offers that have embedded an “attractive basis” compared to historical basis for similar times of the year
- Meanwhile look for opportunities in the futures market to lock in price opportunities by hedging with futures and options
- Remember the do nothing except cash contract at harvest is a strategy