



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

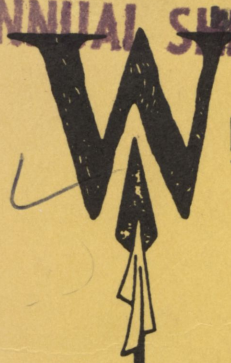
AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

ANNUAL MEETING WITHDRAWN



WESTERN AGRICULTURAL ECONOMICS ASSOCIATION

**PAPERS OF THE  
1989 ANNUAL MEETING**

**WESTERN AGRICULTURAL  
ECONOMICS ASSOCIATION**

GIANNINI FOUNDATION OF  
AGRICULTURAL ECONOMICS  
LIBRARY  
**WITHDRAWN**

APR 9 1991

**COEUR D'ALENE, IDAHO**

**JULY 9-12, 1989**



BASIS BEHAVIOR AT MISSOURI CORN MARKETS BEFORE  
AND AFTER REMOVAL OF TRADING LIMITS ON NEARBY FUTURES CONTRACTS

Francis McCamley and Richard K. Rudel\*

Abstract

Soon after the CBT removed trading limits for nearby agricultural commodity contracts there was concern that the behavior of bases relevant for Missouri grain producers had changed. That conjecture was explored by comparing corn basis behavior during April through November of 1988 with corn basis behavior during 1979 through 1987.

Introduction

The recent growing season was exceptionally dry throughout much of the U.S. The 1988 drouth differed from other recent drouths by beginning earlier and affecting a larger portion of the country.

During the drouth, agricultural commodity prices increased and became more variable. On several occasions, day to day changes in prices of several futures contracts traded on the Chicago Board of Trade (CBT) reached the established trading limits. As in the past, the initial response of the CBT to several days of "limit moves" was to simply increase the trading limits. Then, in late June the CBT removed the limits on nearby soybean and corn contracts.

During the next few weeks, futures price fluctuations were fairly large. It also appeared that the relationship between cash prices actually paid to producers in Missouri and futures prices had changed. There was concern that cash prices were lower than usual relative to futures prices and that bases (differences between cash and futures prices) relevant for Missouri grain producers were more variable than usual.

This paper compares corn basis behavior at six Missouri locations during selected months of 1988 to corn basis behavior in earlier years. The plan of the paper is as follows. First, the trading limit rules for grain futures contracts are briefly reviewed. This is followed by a description of the data and procedures used in this study. The final two sections present the results and some concluding remarks.

Trading Limit Rules

Historically, one of the CBT's rules limited the daily move in the grain futures price for any contract month to no more than double the trading limit. The futures contract price could not increase above the previous day's settlement price by more than the trading limit or decrease below the previous day's settlement price by more than the allowed limit. For example, if the usual trading limit of 15 cents for corn was in effect and the previous day's settlement price was \$3.25 for the December corn futures contract, the trading limit rule would permit a price no higher than \$3.40 and no lower than \$3.10 during the current day.

The trading limits rules allowed changes in the daily limits based on price developments in the futures markets. For the grain commodities traded on the CBT, the daily trading limits could be increased to 150 percent of their current levels if three or more contracts within the same crop year or all contracts in a crop year closed the "limit up" or "limit down" for three consecutive business days. Trading limits were always removed for the last day of trading of a contract.

In late June 1988, the Chicago Board of Trade adopted a new rule, the expanded limits rule, for grain commodities.<sup>1</sup> This rule removes daily trading limits for nearby contracts. Daily trading limits for all deferred futures contracts are still governed by the old rules.

#### Data

Daily corn cash and futures contract price data from the period of April 1, 1979 through November 31, 1988 were used in this study. The data were collected from the Chicago Board of Trade's Statistical Annual, Commodity News Services reports and the Daily Market Summary. The Daily Market Summary reports daily cash truck bids paid to producers for corn in twelve regions within Missouri. Three of the cash market locations are associated with the cities of Kansas City, St. Louis and St. Joseph. The remaining markets are less concentrated as suggested by their names: Northwest, Southwest, Central, North Central, West Central, Northeast Rail, Northeast Barge, Southeast Rail and Southeast Barge.

For each day on which corn contracts were traded and for which cash prices were reported, a basis was computed for each combination of Missouri cash market location and futures contract by subtracting the futures market closing price from the midpoint of the reported cash price interval. Bases were measured in cents per bushel.

#### Procedure

For each month in the April 1988 through November 1988 period the averages and intramonth variability of corn bases at each of the twelve Missouri cash market locations were compared with the monthly averages and intramonth variability of analogous bases at the same locations during the previous nine years.

For any given combination of location, year, calendar month and futures contract the average basis was computed in the usual way. Thus, except for the most deferred contracts, ten (one for each calendar year) basis averages were computed for each combination. These (typically) ten averages were ranked in ascending order. Thus, the (algebraically) smallest of the ten averages was assigned a rank of 1. This approach usually resulted in a rank of 1 for the year in which the absolute value of the average basis was the largest.<sup>2</sup> The rank of the 1988 average provided an indicator of the magnitude of the basis for a specific combination of location, calendar month during 1988 and futures contract relative to bases for the same location, calendar month and the analogous futures contract for other years in the 1979 to 1988 period.

Intramonth basis variability was measured in two ways. One measure was the standard deviation of the basis. The other measure was the ratio of the standard deviation of the basis to the standard deviation of the cash price for the

corresponding location, year and month. The basis variability statistics were ranked in descending order. Thus, the highest ranks (smallest rank numbers) were assigned to the largest standard deviations and standard deviation ratios.

### Results

Results for six Missouri locations are presented in tables 1 through 6. The choice of locations to discuss represents a compromise among the objectives of brevity, geographical diversity and diversity of results.<sup>3</sup> Tables for the other six locations are available from the authors.

The rank numbers for the average basis levels associated with the three "nearest" contracts were mostly 5's and 6's in April 1988. This suggests that these basis levels were at about the medians of the corresponding bases during the 1979 to 1988 period. With the exception of bases involving the nearby (May 1988) contract, the standard deviations of the bases were as small or smaller than usual. Except in Southwest Missouri, the ratio of the standard deviation of the basis associated with the May 1988 contract to the standard deviation of the cash price was larger than during the month of April in any of the years 1979 through 1987. The ratio measures of basis variability were larger than usual for bases associated with July and September 1988 contracts in the Southeast Rail region and at St. Louis. The balance of the ratio measures of basis variability were generally smaller than usual.

In May 1988 the average basis levels associated with the nearby contract were as large or larger than usual. By contrast, the average basis levels associated with most of the more deferred contracts were as small or smaller than usual. The standard deviations of bases associated with the nearby contract were at about the median level except in the Northeast Rail region where the standard deviation was smaller than usual. For the bases associated with the six nearest deferred contracts, the standard deviations were smaller than usual. Many of these standard deviations were smaller than during any of the preceding nine years. The ratio measures of basis variability were mostly smaller than normal during May 1988.

During June 1988, average basis levels were smaller than usual except in the Southeast Rail region and for the basis associated with the July 1989 contract in Southwest Missouri. The standard deviations of the basis were generally larger than usual. The most obvious exceptions are the basis associated with the December 1988 contract at Kansas City and the bases associated with the four nearest contracts in Southwest Missouri. As was the case during May, the ratio measures of basis variability were often smaller than during any of the previous nine years. During June (and, to a lesser degree, July) this was due more to higher than normal variability of cash prices than to smaller than normal variability of bases.

Average basis levels remained smaller than usual during July. The standard deviations of the bases remained larger than usual except for bases associated with some deferred contracts at St. Louis and in Southwest Missouri.

By August, basis levels were generally closer to normal. The same pattern can be observed for the standard deviations of the bases at Kansas City and in the Southeast Rail region. At other locations the standard deviations were generally smaller than usual during August. The ratio measures of basis

TABLE 1 RANKS OF 1988 BASIS MEANS AND VARIABILITY MEASURES AT KANSAS CITY<sup>a</sup>

Futures Contract	Calendar Month							
	April 88	May 88	June 88	July 88	August 88	September 88	October 88	November 88
	-----Ranks-----							
May 88	6, 3, 1	6, 5, 7	NA	NA	NA	NA	NA	NA
July 88	5, 5, 5	4, 10, 10	4, 2, 10	1, 1, 5	NA	NA	NA	NA
September 88	5, 7, 6	4, 10, 10	2, 4, 10	1, 1, 7	3, 1, 1	4, 10, 10	NA	NA
December 88	3, 9, 6	3, 10, 10	2, 9, 10	1, 2, 7	1, 3, 4	4, 6, 9	5, 4, 4	4, 6, 10
March 88	4, 9, 6	3, 10, 10	3, 3, 10	2, 2, 7	2, 4, 5	5, 6, 9	6, 6, 6	4, 10, 10
May 89	4, 9, 6	3, 10, 10	4, 1, 10	3, 2, 9	4, 5, 7	5, 6, 9	6, 7, 10	4, 8, 10
July 89	1, 6, 4 <sup>d</sup>	3, 8, 9	4, 1, 10	4, 2, 9	4, 5, 7	6, 6, 8	7, 8, 10	5, 8, 10
September 89	NA	1, 4, 4 <sup>c</sup>	2, 1, 5 <sup>c</sup>	6, 1, 3	7, 4, 6	7, 4, 6	9, 5, 7	8, 3, 6
December 89	NA	1, 1, 1 <sup>b</sup>	1, 1, 1 <sup>b</sup>	3, 1, 2 <sup>d</sup>	4, 3, 4 <sup>e</sup>	7, 2, 4	9, 3, 5	8, 3, 5
March 90	NA	NA	NA	NA	NA	4, 1, 2 <sup>c</sup>	5, 1, 4 <sup>d</sup>	4, 1, 4 <sup>d</sup>

<sup>a</sup>Each triplet of numbers in the body of the table represents the rank of the average basis, the rank of the standard deviation of the basis and the rank of the ratio of the standard deviation of the basis to the standard deviation of the cash price for the given calendar month and contract combination when compared to all analogous combinations for the April 1979 through November 1988 period.

For the average basis, the smallest value was assigned a rank of 1; for the variability measures the largest values were assigned a rank of 1. Unless otherwise indicated, the largest possible rank number is 10.

<sup>b</sup>The largest possible rank number for this combination is 1.

<sup>c</sup>The largest possible rank number for this combination is 5.

<sup>d</sup>The largest possible rank number for this combination is 6.

<sup>e</sup>The largest possible rank number for this combination is 7.

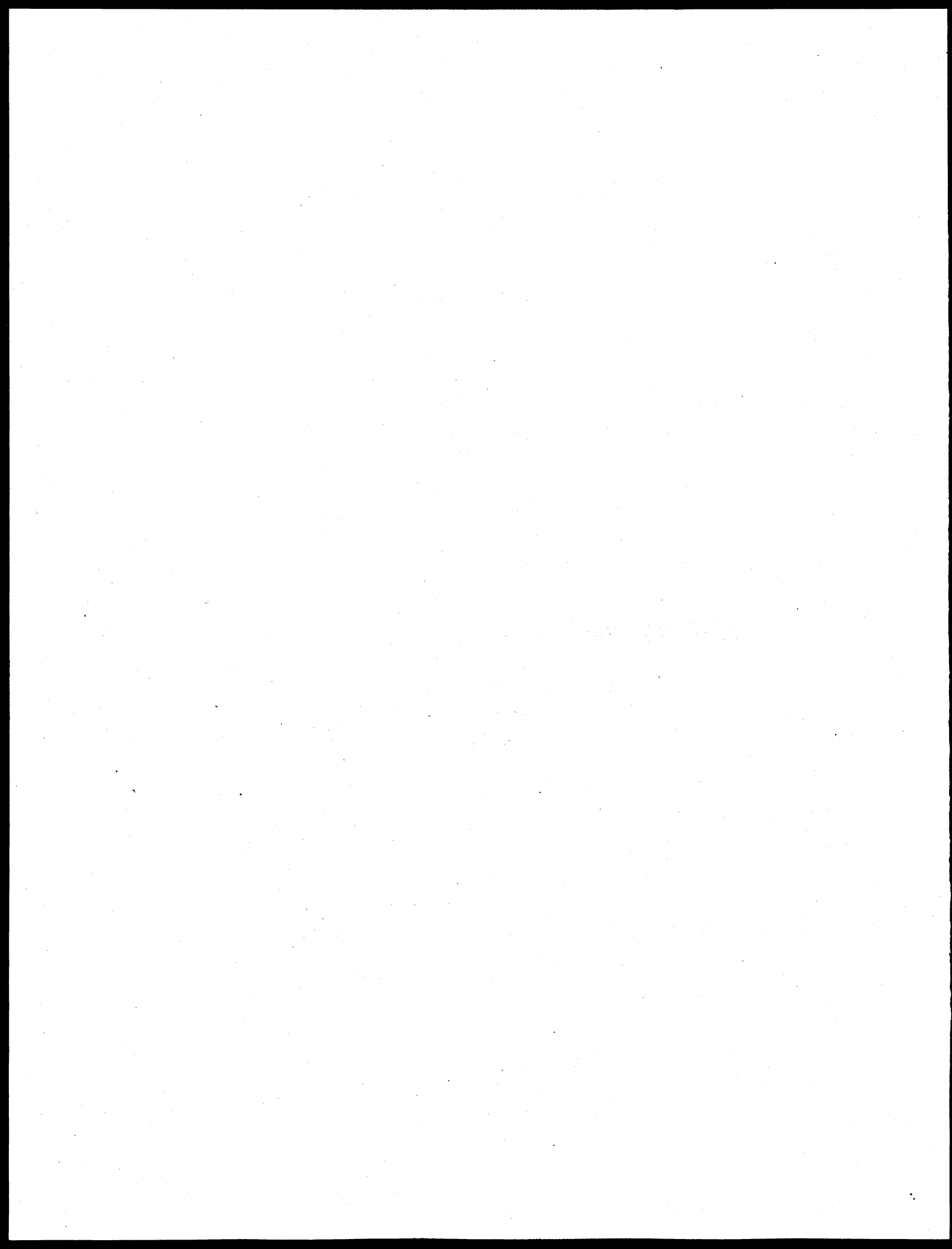


TABLE 2 RANKS OF 1988 BASIS MEANS AND VARIABILITY MEASURES IN NORTHEAST RAIL REGION<sup>a</sup>

Futures Contract	Calendar Month							
	April 88	May 88	June 88	July 88	August 88	September 88	October 88	November 88
	-----Ranks-----							
May 88	6, 6, 1	6, 8, 10	NA	NA	NA	NA	NA	NA
July 88	5, 9, 2	5, 10, 10	2, 1, 10	2, 3, 8	NA	NA	NA	NA
September 88	5, 10, 5	4, 10, 10	1, 1, 10	1, 1, 6	3, 8, 6	6, 8, 6	NA	NA
December 88	5, 10, 9	2, 10, 10	1, 1, 10	1, 2, 9	3, 9, 9	6, 9, 4	8, 5, 2	10, 9, 9
March 88	5, 10, 9	3, 9, 10	3, 2, 10	3, 2, 9	5, 9, 9	6, 9, 4	8, 7, 3	9, 8, 9
May 89	5, 10, 9	3, 9, 10	3, 2, 10	3, 2, 9	7, 10, 9	7, 10, 4	8, 8, 4	9, 8, 10
July 89	1, 6, 5 <sup>d</sup>	3, 8, 9	3, 1, 10	4, 2, 10	7, 9, 9	7, 10, 5	9, 10, 6	9, 8, 9
September 89	NA	1, 4, 4 <sup>c</sup>	2, 1, 5 <sup>c</sup>	6, 1, 7	7, 8, 7	7, 10, 5	9, 10, 10	9, 7, 8
December 89	NA	1, 1, 1 <sup>b</sup>	1, 1, 1 <sup>b</sup>	3, 2, 4 <sup>d</sup>	4, 3, 5 <sup>e</sup>	8, 7, 5	9, 9, 6	9, 5, 6
March 90	NA	NA	NA	NA	NA	5, 1, 2 <sup>c</sup>	5, 5, 4 <sup>d</sup>	5, 3, 5 <sup>d</sup>

<sup>a-e</sup>See table 1 for meaning of footnotes.

TABLE 3 RANKS OF 1988 BASIS MEANS AND VARIABILITY MEASURES IN SOUTHEAST RAIL REGION<sup>a</sup>

Futures Contract	Calendar Month							
	April 88	May 88	June 88	July 88	August 88	September 88	October 88	November 88
	-----Ranks-----							
May 88	6, 2, 1	6, 6, 6	NA	NA	NA	NA	NA	NA
July 88	6, 6, 2	7, 10, 10	7, 2, 10	7, 5, 9	NA	NA	NA	NA
September 88	5, 7, 3	5, 10, 10	4, 2, 10	2, 2, 7	4, 2, 1	7, 9, 9	NA	NA
December 88	5, 9, 6	5, 8, 7	3, 2, 10	2, 2, 9	3, 4, 3	3, 7, 9	9, 8, 8	6, 8, 8
March 88	5, 9, 6	5, 8, 8	5, 2, 10	4, 2, 9	4, 5, 3	6, 7, 9	8, 8, 8	6, 8, 8
May 89	5, 9, 4	5, 9, 9	5, 2, 10	4, 2, 9	5, 6, 4	6, 6, 8	9, 9, 9	6, 8, 8
July 89	1, 5, 2 <sup>d</sup>	4, 7, 8	5, 2, 10	5, 2, 9	6, 6, 5	7, 5, 8	9, 8, 9	6, 7, 8
September 89	NA	1, 4, 3 <sup>c</sup>	3, 1, 5 <sup>c</sup>	10, 1, 4	8, 9, 9	8, 4, 7	9, 6, 9	7, 6, 7
December 89	NA	1, 1, 1 <sup>b</sup>	1, 1, 1 <sup>b</sup>	6, 1, 4 <sup>d</sup>	6, 4, 6 <sup>e</sup>	9, 4, 6	9, 6, 4	8, 4, 7
March 90	NA	NA	NA	NA	NA	5, 1, 1 <sup>c</sup>	5, 3, 3 <sup>d</sup>	4, 1, 4 <sup>d</sup>

<sup>a-e</sup>See table 1 for meaning of footnotes.



TABLE 4 RANKS OF 1988 BASIS MEANS AND VARIABILITY MEASURES AT ST. JOSEPH<sup>a</sup>

Futures Contract	Calendar Month							
	April 88	May 88	June 88	July 88	August 88	September 88	October 88	November 88
	-----Ranks-----							
May 88	6, 3, 1	7, 6, 8	NA	NA	NA	NA	NA	NA
July 88	5, 6, 4	4, 10, 10	3, 2, 9	2, 2, 10	NA	NA	NA	NA
September 88	5, 9, 6	4, 10, 10	2, 2, 9	1, 2, 7	4, 3, 3	4, 9, 9	NA	NA
December 88	3, 10, 6	3, 10, 10	2, 3, 10	1, 3, 8	3, 6, 7	4, 10, 10	5, 5, 4	5, 4, 5
March 88	4, 10, 6	3, 10, 10	4, 1, 10	4, 3, 8	4, 6, 7	4, 10, 10	6, 5, 7	5, 9, 10
May 89	4, 10, 7	3, 10, 10	4, 1, 10	4, 3, 9	4, 7, 7	5, 9, 10	6, 6, 8	5, 9, 10
July 89	1, 6, 4 <sup>d</sup>	3, 9, 10	4, 1, 10	4, 2, 9 <sup>i</sup>	6, 7, 8	6, 8, 10	7, 10, 10	5, 9, 10
September 89	NA	1, 4, 4 <sup>c</sup>	2, 1, 5 <sup>c</sup>	6, 1, 6	7, 6, 7	7, 5, 8	9, 5, 6	8, 5, 6
December 89	NA	1, 1, 1 <sup>b</sup>	1, 1, 1 <sup>b</sup>	3, 1, 4 <sup>d</sup>	4, 5, 6 <sup>e</sup>	7, 3, 4	9, 4, 4	8, 3, 5
March 90	NA	NA	NA	NA	NA	3, 1, 2 <sup>c</sup>	5, 2, 3 <sup>d</sup>	4, 2, 4 <sup>d</sup>

<sup>a-e</sup>See table 1 for meaning of footnotes.

TABLE 5 RANKS OF 1988 BASIS MEANS AND VARIABILITY MEASURES AT ST. LOUIS<sup>a</sup>

Futures Contract	Calendar Month							
	April 88	May 88	June 88	July 88	August 88	September 88	October 88	November 88
	-----Ranks-----							
May 88	7, 3, 1	9, 5, 9	NA	NA	NA	NA	NA	NA
July 88	5, 6, 1	5, 10, 10	1, 1, 9	3, 1, 7	NA	NA	NA	NA
September 88	5, 9, 2	4, 9, 10	1, 1, 9	1, 1, 9	3, 2, 1	7, 10, 8	NA	NA
December 88	4, 10, 7	3, 6, 9	1, 1, 10	1, 5, 10	1, 6, 4	4, 7, 6	6, 10, 10	5, 6, 6
March 88	4, 10, 8	3, 6, 10	2, 1, 10	3, 6, 10	2, 6, 5	6, 7, 7	7, 10, 10	5, 9, 10
May 89	4, 10, 7	3, 6, 10	3, 1, 10	3, 6, 10	3, 8, 7	7, 9, 8	8, 10, 10	6, 10, 10
July 89	1, 6, 5 <sup>d</sup>	4, 7, 10	4, 1, 10	4, 3, 10	7, 7, 7	7, 9, 9	8, 10, 10	7, 10, 10
September 89	NA	1, 4, 4 <sup>c</sup>	2, 1, 5 <sup>c</sup>	6, 1, 6	7, 5, 6	8, 8, 8	9, 4, 8	8, 7, 7
December 89	NA	1, 1, 1 <sup>b</sup>	1, 1, 1 <sup>b</sup>	3, 1, 3 <sup>d</sup>	4, 4, 5 <sup>e</sup>	9, 5, 5	9, 5, 5	8, 5, 5
March 90	NA	NA	NA	NA	NA	5, 1, 2 <sup>c</sup>	5, 3, 4 <sup>d</sup>	4, 3, 4 <sup>d</sup>

<sup>a-e</sup>See table 1 for meaning of footnotes.

TABLE 6 RANKS OF 1988 BASIS MEANS AND VARIABILITY MEASURES IN SOUTHWEST MISSOURI<sup>a</sup>

Futures Contract	Calendar Month							
	April 88	May 88	June 88	July 88	August 88	September 88	October 88	November 88
	-----Ranks-----							
May 88	6, 10, 6	8, 6, 8	NA	NA	NA	NA	NA	NA
July 88	5, 10, 10	7, 9, 9	3, 4, 10	3, 2, 9	NA	NA	NA	NA
September 88	5, 10, 10	6, 10, 10	3, 5, 10	2, 5, 10	2, 10, 10	4, 10, 10	NA	NA
December 88	5, 10, 7	5, 10, 10	2, 6, 10	2, 7, 10	2, 9, 10	4, 10, 10	4, 7, 9	4, 1, 2
March 88	5, 9, 7	5, 10, 10	3, 5, 10	4, 7, 10	2, 9, 10	4, 10, 10	4, 8, 10	4, 3, 4
May 89	5, 10, 8	5, 10, 10	3, 3, 10	5, 7, 10	4, 9, 10	4, 10, 10	5, 8, 10	4, 5, 4
July 89	1, 6, 2 <sup>d</sup>	5, 9, 10	5, 1, 10	5, 7, 10	6, 9, 10	7, 10, 10	5, 8, 10	5, 6, 5
September 89	NA	1, 2, 4 <sup>c</sup>	2, 1, 5 <sup>c</sup>	6, 3, 9	6, 5, 8	7, 9, 10	7, 7, 7	7, 8, 5
December 89	NA	1, 1, 1 <sup>b</sup>	1, 1, 1 <sup>b</sup>	3, 1, 4 <sup>d</sup>	4, 2, 6 <sup>e</sup>	8, 7, 8	9, 5, 6	8, 9, 5
March 90	NA	NA	NA	NA	NA	4, 4, 3 <sup>c</sup>	5, 2, 5 <sup>d</sup>	4, 5, 3 <sup>d</sup>

<sup>a-e</sup>See table 1 for meaning of footnotes.

variability were smaller than during any of the nine preceding years for bases associated with the five nearest contracts in Southwest Missouri. At the other extreme, the ratio measure of variability at Kansas City, in the Southeast Rail region and St. Louis was larger than during any of the preceding nine years for the basis associated with the September 1988 contract.

During the months of September, October and December, most of the average basis levels were close to or larger than normal. Standard deviations of the bases were mostly smaller than usual. Bases associated with the most deferred contracts provide some exceptions. Two other exceptions are the bases associated with the two nearest contracts during November in Southwest Missouri. The ratio measures of basis variability were mostly smaller than usual during the months of September, October and November 1988.

The results described in this paper are very similar to those obtained in a study of soybean basis behavior.<sup>4</sup> The major difference is that soybean basis behavior was more uniform across locations.

#### Concluding Remarks

Based on casual observations made before this study was completed, it would have been tempting to conclude that the removal of trading limits on corn futures contracts was responsible for most of the reductions in basis levels and increases in basis variability. The results of this study are consistent with the hypothesis that removal of the trading limits on nearby contracts may be

partially responsible for these changes. However, given that some of these changes began in June and that the traditional trading limits rules were in effect for all but a few business days in June, some of the observed changes in basis behavior are almost certainly due to the drouth itself.<sup>5</sup> Moreover, the somewhat usual aspects of basis behavior observed in June, July, and to a lesser extent, May and August did not persist and were replaced by somewhat abnormal behavior of opposite types in September through November.

#### Footnotes

\*The authors are associate professors of Agricultural Economics at the University of Missouri-Columbia.

1. Discussion of this new rule is based on a telephone conversation with Paul E. Peterson, Marketing Manager at the Chicago Board of Trade.
2. In most cases, this meant that the rank of 1 was assigned to the year for which the cash price was smaller than the futures price by the largest amount and the rank of 10 was assigned to the year for which the cash price was smaller than the futures price by the smallest amount. However, the fact that Missouri cash prices were not always smaller than the futures price meant that the sign as well as magnitude of the basis had to be considered in assigning ranks.
3. For example, results for the Southeast Barge and Northeast Barge locations are not discussed partly because they are similar to those for St. Louis and partly because of their geographic proximity to the Southeast and Northeast Rail locations.
4. A paper discussing soybean basis behavior is available from the authors.
5. One effect of the drouth was to hamper barge traffic particularly on the Lower Mississippi. This is one way in which the drouth could have influenced the level and variability of the basis.

#### References

- Chicago Board of Trade. Statistical Annual: Cash and Futures Data. Market Information Section. Chicago, 1979 through 1986.
- Missouri Department of Agriculture. Daily Market Summary. Vols. 19(1979) to 28(1988). Market News Section. Jefferson City, Missouri.