ANALYSIS OF INTER-MARKET PRICE SPREADS FOR KANSAS WHEAT: 1977 - 1983

by

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B. S., Kansas State University, 1982

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Agricultural Economics

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1984

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ACKNOWLEDGEMENTS

To my major professor, Dr. L. Orlo Sorenson, I express my sincere appreciation for the professional knowledge, time, and energy he gave during my graduate program, especially in the development of this thesis.

I am also very grateful for the interest and assistance that Dr. Orlen Grunewald and Dr. Arlin Feyerherm provided as members of my graduate committee.

A special thank you is owed to Larry and Christy Wagner for their help in typing the text of this thesis.

To my parents, I extend my loving thanks for the encouragement they have given me throughout my education.

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I. INTRODUCTION

Kansas is the number one producer of wheat in the United States. In 1982, 462 million bushel were produced having a farm value of 1.64 billion dollars, or about 25 percent of Kansas´ realized gross farm income.[1] A majority of the wheat produced must be transported from surplus production areas to deficit areas, both domestic and foreign. Over half of the annual shipments are usually for export sales.

Although the "price" of No. 1 Hard Red Winter wheat is determined each weekday at the Kansas City Board of Trade, the various major cash markets -- Gulf exporters, wheat millers, terminal merchants -- will have prices which differ from the futures contract price by their "basis". As a consequence, each cash market has a price that represents its unique situation according to geographic location and current supply-demand conditions. Kansas local elevators are separated from these major markets by substantial distances. The total cost of shipping Kansas wheat to these markets can be a significant portion of the final sale value of the wheat. Transportation charges and operating margins are significant determinants of the differential between the local price and the price paid for wheat delivered to a market such as a Gulf of Mexico port. For example, the maximum price spread between a Thomas County elevator and the Gulf export market since January 1977 has been 1.37 dollars per bushel in the second week of January 1981. The rail rate to the Gulf was 1.14 dollars per bushel on that same day. Hence, of the 5.25 dollars per bushel wheat was worth at the Gulf, producers selling wheat to this Thomas County elevator received only 3.88 dollars per bushel, or slightly less than

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1. "Kansas County Data, 1982-1983," Kansas Crop and Livestock Reporting Service, June, 1983, p. 4.

75 percent of the export price. If the transfer costs for delivering the wheat to foreign countries are considered, Kansas wheat producers receive an even smaller portion of wheat's final sale value. While the Gulf export price is determined by the world wheat market, the price at an individual Kansas elevator is primarily a function of transfer costs. As such, producers are directly affected by these transfer costs that dictate what their marketing bill will be. The importance of transfer costs, and specifically transport charges, can be understood best by examining the implications of a one cent per bushel decrease in the average transfer cost for a bushel of Kansas wheat; assuming all 462 million bushel of Kansas wheat produced in 1982 was shipped to deficit areas, a one cent per bushel decrease in average transfer costs would have provided Kansas wheat producers 4.62 million dollars more in farm income and subsequently, generated additional income in rural communities.

Transportation cost is normally the largest component of an inter-market price spread. Prior to passage of the Staggers Rail Act of 1980, rail transport rates were controlled extensively by rate bureaus and the Interstate Commerce Commission. The net result of the pre-Staggers regulatory environment was relative stability of rail rates with a stable pattern of geographic price relationships. However, passage of the Staggers Rail Act created a new regulatory environment in which innovative rate making has occurred. The new transportation options provide railroads with operating cost economies. Wheat shippers have experienced lower transport costs. Since post-Staggers rail rates are more market-oriented, some geographic price relationships have been modified.

The economic importance of price spreads between local elevators and the major markets is unmistakable. This study, by analyzing the composition and behavior of several inter-market price spreads, will foster a better understanding of the behavior of the Kansas wheat market, which facilitates improved decision making and hence, lower resource cost in the marketing function.

II. STATEMENT OF OBJECTIVES

The objectives of the study are:

1. To document and characterize changes in railroad freight charges and services for transporting wheat from January 1977 through June 1983.

2. To determine the general level and variability of the price spreads between the Gulf of Mexico and the quoted prices at Kansas City and at fourteen Kansas elevators, and the changes in the general level and variability of spreads throughout the study period.

3. To determine the general level and variability of the price spreads between Kansas City and each of fourteen Kansas local elevators, and the changes in the general level and variability of spreads throughout the study period.

4. To identify and specify major factors that account for the total price spreads between fourteen Kansas elevators and the Kansas City terminal market and Gulf of Mexico export market.

5. To test the pricing performance of the Kansas wheat market.

6. To examine changes in geographic price relationships between Kansas elevators, the Kansas City terminal market, and the Gulf of Mexico export market.

7. To identify implications for Kansas wheat producers and grain merchants of the findings from objectives 1 through 6.

III. LITERATURE REVIEW

Basically, this paper deals with wheat prices, their determinants, and some geographical relationships among those prices. And it does so over a time period in which the deregulation of the railroad industry occurred. Hence, it is appropriate here to review hriefly economic literature in which the authors attempt to predict the impact of the Staggers Rail Act of 1980 on agriculture and the Kansas wheat market. In addition, two articles will he reported which offer some insight into past analysis of the "price discovery" process in grains. Lastly, an article on grain export pricing performance is reviewed as hackground for Chapter IX, "Pricing Performance in the Kansas Wheat Market."

Potential Impact of Transportation Deregulation

Johnson and Fruin, in separate papers, concluded that there will he individual losers from modification of railroad regulation, but that agriculture, as a whole, will henefit. According to Johnson, reform of transportation regulation should provide agriculture with many "opportunities."[2] However, Fruin was "not convinced that the distrihution of the economic returns will he equitahle."[3] Despite the uncertain outcome, Johnson suggested the remaining rate and entry restrictions on railroads and motor carriers he discarded so they can move toward "true deregulation."[4]

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2. Marc A. Johnson, "Impact on Agriculture of Deregulating the Transportation System," Amer. J. Agr. Econ., 63 (1981): 918.

3. Jerry E. Fruin, "Impacts on Agriculture of Deregulating the Transportation System: Discussion," Amer. J. Agr. Econ., 63 (1981): 923.

4. Johnson, p. 918.

The two authors reviewed ahove appear optimistic for agriculture as a whole, hut realized some areas or industries will suffer hecause of deregulation. One such potential area which is of interest is the Kansas wheat market. Bahcock provided an analysis of the expected behavior of rail rates for wheat from Kansas origins to major markets under deregulation.

Babcock recognized that the Staggers Act provides much more freedom to increase rail rates, hut that there were provisions which encourage intra-railroad competition, such as the limits on rate hureaus and the legalization of contracts.[5] Because of the numerous effects of intra-railroad competition, only intermodal competitive restraints on rail rates were reported hy him.

Bahcock's analysis was of wheat shipments in 1977 from Kansas to points in the East and to the Gulf of Mexico. On shipments to Eastern mills, it was found that "truck-harge competition would prevent suhstantial rail rate increases . . ." Concerning exports through Houston and New Orleans, "truck-harge competition appears to offer limited capacity for rail rate increases."[6] However, the deterent to rate increases is not as great for shipments originating in Southwest Kansas as it is for origins further east in Kansas.[7] Bahcock pointed out that the study was done while holding transport conditions in the trucking industry constant.

From the studies reviewed here, it seems deregulation should he heneficial to agriculture, specifically the Kansas wheat market, but there will be some Kansas farmers and shippers who may not henefit from changes.

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5. Michael W. Babcock, "Potential Impact of Railroad Deregulation in the Kansas Wheat Market," J. Econ., 7(1981): 93.

6. Ihid., pp. 94-95.

7. Ibid., p. 95.

Price Discovery in Grains

Farris descrihed two phases of "price discovery" for soft red winter wheat at the local elevator level in two areas of Indiana.[8] Phase 1 was determination of the general level of prices hased on supply-demand conditions. Phase 2 entailed determining the value of a specific batch of grain relative to the general market level. Two separate studies were done in 1955 and 1956 to analyze each phase separately.

Regarding Phase 1, the period hetween July 5 and July 16, 1955 was used for analyzing data on 31 elevators in the northcentral area of Indiana and on 26 elevators in the southwestern corner of Indiana. Data collected daily included huying and selling prices, quantities hought and sold, and destinations of the sales. Also, general characteristics of the elevators were ohtained.

Variations in price spreads were reported. For elevators within the northern area, the daily price spread reached an average of 5 cents per bushel, as compared to 4.5 cents in the South. When comparing the two regions, the southern area price averaged ahout 2 cents per hushel higher than the average price in the North, within a range of .9 and 3.2 cents per hushel.[9] In testing the hypothesis that elevators within a town should quote the same price, Farris found the maximum difference to he 4 cents and 6 cents per hushel for the South and the North, respectively.[10] Only one town had an elevator which consistently had a higher bid than the other firm(s) at the

8. Paul L. Farris, "The Pricing Structure for Wheat at the Country Elevator Level," J. Farm Econ., 40(1958): 607-624.

9. Farris, p. 609.

10. Ihid., p. 610.

same location. Season weighted average gross margins at local elevators in the northern area exhibited a wide range, from 3.7 to 11.0 cents per bushel, and showed "some variation by location."[11]

Some conclusions or observations made by Farris were that high-volume elevators "were generally those with relatively high paying prices, and . . . low margins." More notably, Farris found that "differences in railroad freight rates, . . . ,appeared in a few cases to have some influence on elevator paying prices, but this influence was overshadowed by the effects of other variables, such as factors affecting margins and local competitive situations."[12] It was also found that line elevators were price leaders. The short-run price variation among elevators was blamed on market imperfections like information lags and lack of market knowledge; however, Farris predicted that improvements in the market system would reduce such price variation.

The balance of the study covered Phase 2 of "price discovery." Two steps were involved in this phase: 1) Procuring a representative sample from each batch of grain bought or sold, and 2) "accurately determining the grade and price discount for each sample selected." Farris only looked at the second step. Therefore, the purpose was to determine the differences between elevator and laboratory determinations of grade and price. Fewer elevators than in the 1955 study were sampled during the 1956 wheat harvest in the same areas of Indiana.

With respect to grade determination, only test weight, moisture content, and garlic had significant effects. Elevators in the North erred on test

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11. Farris, p. 612.

12. Ibid., p. 612.

weight determinations in s range from -1.35 to 1.01 pounds; the southern elevators' range was less than a third of this.[13] Moisture content, as determined by elevators, differed from actual by -.48 to .57 percent in the North, and by -.86 to .30 percent in the South.[14] Evaluation of the sccuracy of garlic determination was not possible due to elevator practices. Other grading factors were not important; protein content wss not of significance to soft red winter wheat.

Farris put forth two explanations for actual elevator discounting to have been less than that indicated by laboratory tests. First, it was not known whether quoted prices accurately reflected supply-demand conditions, and elevators could hsve been hesitant to upset farmers through discounting. Secondly, elevators used lenient grading and discounting to "attract sideline business."[15]

The implication is that there was very little incentive in the pricing system for producers to deliver high quality wheat; low quality was overvalued and high quality was not adequately rewarded.

For elevators in Illinois, daily prices for #2 yellow corn, firm and market characteristics, snd county production and marketing data were analyzed by Davis and Hill for three periods -- harvest, distribution, and diminishing supply. The harvest period ran from September 16 to December 31, 1969; distribution occurred from January 5, 1970 until May 18, 1970; s diminishing

13. Farris, p. 614.

14. Ibid., p. 615.

15. Ibid., p. 623.

supply existed between May 19, 1970 and July 27, 1970.[16]

Their objective was "to explain price differentials among country elevators in Illinois and to identify the extent of market imperfections associated with them."[17] Four general causes of price variability among country elevators were differences in: 1) transportation availability and cost, 2) operating costs, 3) local supply and demand, and 4) market power. The authors pointed out that transportation cost is usually used to explain geographical price differences, but that grain must be able to move between the specific locations if that cost is to be a limit to the price spread. According to Davis and Hill, some monopsony power must exist if differences in the elevators' operating costs are to be reflected in price spreads.

To perform the analyses, 40 independent variables were reduced to 13 factor scores to be used in a multiple regression. The dependent variables were the average daily bid prices of the 41 elevators in each time period. Three different analytical models were used, one for each of the time periods mentioned earlier.

The results for the harvest period indicated that the variables which were significant in explaining price variation among elevators were local supply, local demand, transportation rate, farm service, and storage space. The farm service variable incorporated the following elements: 1) private or cooperative elevator, 2) percent of gross income from grain, and 3) ownership of a grain dryer.[18] According to the authors, a positive coefficient for

16. Leroy Davis and Lowell Hill, "Spatial Price Differentials for Corn among Illinois Country Elevators," Amer. J. Agr. Econ., 56 (1974): 141.

17. Davis and Hill, p. 135-136.

18. Ibid., pp. 137, 140-142.

transportation rate implied it was proxy for the availability of distant markets which evidently gave hetter hids. The more diversified the elevator was, the higher were its prices. Elevators more fully utilizing their storage space (especially upright facilities) had lower prices.

For the distrihution period, the variahles listed for the harvest period were also significant. In addition, grain movement, production area, elevator type, and harge shipment utilization were important factors affecting price variahility. A high turnover rate or high amounts of CCC stored grain resulted in lower prices paid for current sales. Subterminals and single location elevators offered higher prices than line elevators. Higher prices were paid if there was access to harge shipment than if harge shipment was not availahle.

During the diminishing supply period, the significant variables were very similar to the harvest period except local demand differences were insignificant and availability of harge shipment became a more significant variahle.

In drawing implications from the models' results, the authors noted that many of the significant explanatory variahles for geographic price differences were beyond the control of the respective elevator managers. Their results also inferred that market imperfections showed up as partial monopsony during the harvest period. One important ohservation concerned government programs and it was that "the relative inflexibility of support prices may perpetuate spatial price differentials . . ."[19] In summary, their study "identifies the grain marketing system as a highly developed, responsive market of competing firms, operating in an industry structure characterized hy monopsonistic com-

19. Ihid., p. 143.

petition and seasonally induced spatial monopsony."[20]

Pricing Performance in the U.S. Grain Export Industry

Thompson and Dahl provided an analysis of the economic performance of the U.S. grain export industry using performance criteria of pricing and productive efficiency. The specific portion of their research that is relevant to the current study of the Kansas wheat market is the evaluation of pricing efficiency.

In justifying the research, the authors noted that the grain export industry was often identified with a "typically oligopolistic system" which inferred suboptimal performance. Rather than evaluate the industry based on market structure characteristics, their study had its "major emphasis on the measurement of the performance of the industry."[21] Pricing efficiency is one measure of market performance.

This study measured pricing efficiency by comparing actual price behavior in spatially separated markets to expected price behavior in a perfectly competitive market. The authors discussed the economic theory which says that prices at spatially separated markets should not differ by any more than the minimum transfer costs of which transportation costs are often the most significant. Furthermore, deviations in the price differential from the minimum transfer cost should be randomly distributed around zero as a result of "random, exogenous supply or demand shocks at one market or another" and corresponding arbitrage when the price differential exceeds transfer costs.[22]

20. Davis and Hill, p. 143.

21. Sarahelen R. Thompson and Reynold P. Dahl, "The Economic Performance of the U.S. Grain Export Industry," Technical Bulletin No. 325, University of Minnesota Agricultural Experiment Station, 1979, p. 4.

Transportation cost was the only transfer cost specifically accounted for in the analysis because of difficulty in collecting other transfer costs such as elevation costs, interest, and insurance. Thus, the authors pointed out that the average difference in prices between markets after adjustment for transportation cost will not be zero, but instead will approximate the average of the other transfer costs. However, the "deviations from this positive average difference should behave the same as the deviations would from an average difference of zero" as described earlier.[23]

The export grain studied was corn and prices used were from five different markets -- a Minnesota country elevator, the Chicago terminal, an East Coast port, a Gulf of Mexico port, and Rotterdam (foreign market). The domestic markets' prices were for U.S. #2 Yellow Corn, while Rotterdam prices were quoted for U.S. #3 Yellow Corn; the Rotterdam price was adjusted for quality. The transportation costs included in the analysis were trucking costs from the country elevator to a river elevator, barge costs down the Mississippi River, rail rates to the East Coast and to the Gulf, when necessary, and ocean freight charges (excluding loading and unloading costs) to Rotterdam. Barge and rail rates were actual costs incurred by a "large exporting firm." The ocean freight rate was an average of several firms' shipments. Analysis was performed on price differentials between the origin and destination markets of 1) country elevator and the Gulf, 2) Chicago and the Gulf, 3) Chicago and the East Coast, 4) the Gulf and Rotterdam, 5) the East Coast and Rotterdam, and 6) the East Coast and the Gulf (two destination markets).

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22. Thompson and Dahl, p. 5.

23. Ibid., p. 6.

In order to test for efficient pricing by grain exporters, the destination market's price was adjusted by subtracting from it the transportation cost between the origin market and the destination market. Hence, the origin price (i.e. country elevator price) and the adjusted destination price (i.e. Gulf price - transportation cost) now differed only by the total of the other transfer costs and by unexplained deviations. The authors stated "these prices, if the markets are behaving efficiently, should be highly correlated."[24] To examine this behavior, the destination market's price was regressed against the origin market's price. The regression's intercept approximated non-transportation transfer costs. The slope coefficient on the origin price and the coefficient of determination (R^2) indicated the "strength of the relationship between prices." A slope coefficient equal to one meant the prices had a one-to-one relationship in their movement exclusive of changes in transfer costs. The R^2 term measured the amount of variability in the destination market's price that was explained by the variability in the origin market's price, and vice versa. The same type of regressions were used on the total price spread unadjusted for transportation costs; these provided comparisons to the previously described regressions.

In addition to using the regressions to measure how well one price explained the other, another method was also used on the adjusted differential between the origin's price and the destination's price to test pricing efficiency. According to the authors, if efficient markets and constant transfer costs existed, then "the observed variation in transfer costs should appear to be random, with positive and negative deviations of the same size being equally likely to be observed"; the deviation may also appear to be normally

24. Thompson and Dahl, p. 8.

distributed.[25] Examination of the price differential's randomness was done by: 1) plotting each differential against time, 2) "turning point test" which compares actual number of peaks and troughs to that number expected in a random series, 3) "run of signs test" which compares the number of observations above the mean difference to the number of observations below the mean difference. Besides the tests for randomness, tests for normality were also done on the price differential. Normality tests included measures of skewness and of kurtosis, and plots of the price differential against normal probability order statistics ("rankit plot"). The authors emphasized the requirement of constant transfer costs over time if the distribution tests described above were to be valid tests of pricing efficiency. Consequently, the price differentials adjusted for transportation cost were most likely to meet this requirement.

From the regressions of destination price (adjusted and unadjusted) on the origin price for the previously defined corn shipments, it was found that there was a high degree of correlation between the prices.

The range of the coefficient of determination for the unadjusted prices was from 0.932 to 0.978 and for the adjusted prices was 0.933 to 0.980 (neither range includes the East Coast-Rotterdam movement). Hence, the adjustment of the destination market's price improved the regression's fit. Furthermore, the regressions on the adjusted prices had slope coefficients on the origin markets' price that were not significantly different than 1 with α=.01. The authors conclude that "corn prices at different market locations move more closely together" if the transportation cost effect was removed. Assuming the corn prices were efficient and competitive, they examined the regressions'

25. Thompson and Dahl, p. 8.

intercept coefficient as a measure of other transfer costs besides transportation. These intercepts in cents per bushel were 22.42 for the country elevator-Gulf movement, 14.91 for the Chicago-Gulf movement, -2.68 for the Chicago-East Coast movement, -15.41 for the Gulf-East Coast comparison, and 15.79 for the Gulf-Rotterdam movement. The authors explained the large transfer cost from country elevator to the Gulf as a result of the numerous times the corn must be handled (loaded, unloaded). However, the intercept coefficients do not represent the mean of the difference between the adjusted origin and destination prices since the slope coefficients were not exactly equal to 1. The mean differences in cents per bushel were 13.0 between country and the Gulf, 4.8 between Chicago and the Gulf, -6.9 between Chicago and the East Coast,11.8 between the East Coast and the Gulf, 11.7 between the Gulf and Rotterdam, and 16.2 between the East Coast and Rotterdam. The authors found these differences to be reasonable except for the Chicago to East Coast price differential and the East Coast-Gulf comparison.

For the examination of the adjusted price differential distribution properties, each differential was plotted over time. The authors concluded "in some instances, the difference between destination prices adjusted for transportation and origin prices clearly is not randomly distributed around a mean transfer cost" and patterns existed in some relationships. Besides the visual analysis provided by the plots, the two statistical tests on randomness also indicated the price differences were not random. According to Thompson and Dahl, the non-random results were conclusive for the differences between Chicago and both the East Coast and the Gulf, and also the difference between the East Coast and the Gulf. For the other price differences, they "appear to be non-random, depending on the criterion used." The price differences were also examined for normality. The measures of skewness and kurtosis, in addition to the "rankit plots" yielded these conclusions for the authors: 1) the price differences between Chicago and both the Gulf and the East Coast were not normally distributed, 2) the price difference between the country elevator and the Gulf appeared normally distributed, and 3) the results were inconclusive for the price differences between Rotterdam and both the Gulf and the East Coast.

The results of the tests discussed above were summarized by the authors as indicating "prices are closely linked and highly responsive to each other throughout the export marketing channel" and the price differentials excluding transportation cost "do not appear to be randomly distributed around a constant transfer cost in most cases." However, they argued that the non-random variation of the price differentials was very small and it may have been "largely attributable to other market factors." The other market factors discussed were: 1) regulated rail rates versus unregulated barge rates, 2) seasonality of transfer costs excluding transportation, 3) stronger export demand at the Gulf than at the East Coast, and 4) supply and demand shocks.[26]

From these results, the authors concluded that the pricing performance of the U.S. grain export industry was efficient. They stated that the pricing efficiency "meets efficiency criteria characteristic of perfectly competitive markets."

The rest of Thompson and Dahl's paper focused on productive efficiency of the U.S. grain export industry. Suffice it to say, their analysis found evidence which "suggests that the industry is productively efficient."

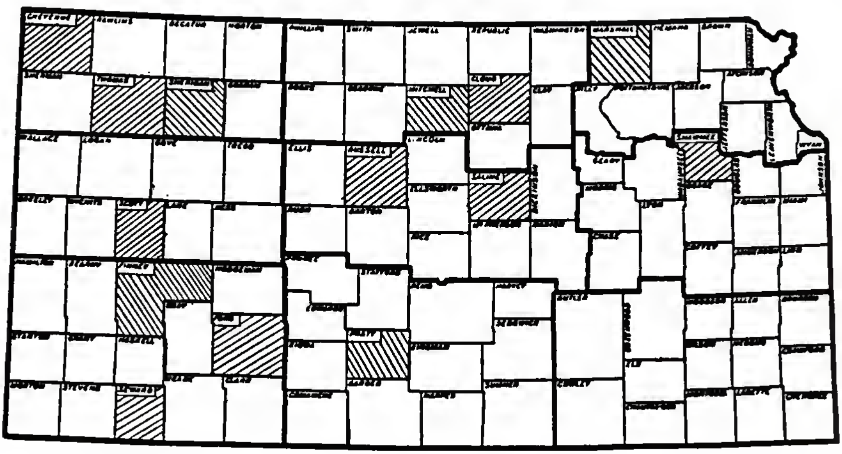
26. Thompson and Dahl, p. 15.

Although the studies reviewed here did not deal with Hard Red Winter wheat, most of the findings can be applied in some way to the Kansas wheat market. Keeping this information in mind should provide better insight into the particular findings of the current study.

IV. STUDY PROCEDURE

Price data were collected from fourteen elevators throughout a large portion of Kansas from January 1977 to June 1983 in order to make this study on inter-market price spreads. The price recorded for each location is the price quoted to producers after the close of the futures market. The fourteen elevators are identified by the county in which they are located; Figure 1 illustrates the locations on which this analysis is based.

FIGURE 1. Location of Elevators



Objective 1 was accomplished by reviewing the structure of rail rates and services over the entire study period. The Kansas City Board of Trade Grain Rate Book provided the necessary information to describe each type of rail transport rate used in the study. Rail rates from each location to the Gulf of Mexico and to Kansas City were examined to determine which locations incurred the larger rate increases and/or decreases.

The relevant price spreads were defined before performing the analysis set out by the second and third objectives. Each price spread was documented on a quarterly basis along with the absolute and percentage changes from the previous quarter. Because price spreads are heavily influenced by transportation costs, the differential between the total spread and the rail rate studied in the first objective was more fully analyzed to evaluate the non-transportation related behavior of the price spreads between each local elevator and the Kansas City and Gulf markets. The spread between the Gulf price and the Kansas City price was compared to the average rail transportation cost between Kansas City and the Gulf to see the relationship between these two major markets' prices. The price differential between rail-delivered wheat and truck-delivered wheat in Kansas City was examined by regression techniques to test for seasonality and for changes in its level as a result of new rail rates not requiring transit billing.

Objective 4 was fulfilled in part by discussing the theoretical components of an inter-market price spread. A model was hypothesized to explain the variability of the differential between the price spread and the rail rate in terms of non-transportation factors. Multiple regression analysis estimated the effect of various independent variables on this differential.

For the fifth objective, the meaning of pricing performance was discussed first. The strength of the relationship between origin prices and destination prices, and the randomness and normality of the differential between origin and destination prices adjusted for transportation costs were examined to arrive at a conclusion on the pricing efficiency of the Kansas wheat market.

Geographical price relationships were examined by measuring how locations compared with each other regarding the decrease in their Gulf of Mexico-Local elevator price spread. This analysis was followed by an evaluation of how local elevator prices changed with respect to each other. Graphical display was the main tool for this analysis.

Lastly, the findings from the analysis outlined by Objective 1 through Objective 6 are assimilated to draw implications for Kansas wheat producers and grain merchants.

Throughout the text, topics are discussed on a calendar year basis and/or a crop year basis. Unless crop year is specifically stated, "year" represents calendar year. Additionally, figures are all plotted by calendar year, although some figures are discussed with respect to crop year relationships.

V. STUDY SETTING

Local Elevator Price Determination

Although the general price level of grain is determined by supply and demand, several prices for a bushel of grain can exist at any given time. A large number of firms are engaged in the buying and selling of grain. Because each firm has its own unique market situation, not all bid or offer prices are likely to be equal. Local elevator managers must be knowledgable of all market characteristics -- including supply-demand conditions, expectations, marketing strategies, unique participant behavior, and historical behavior, just to name a few.

Local elevator managers have several pricing strategies available to them. They may choose one of the following, or a combination thereof: 1) margin pricing with minimal net positions, 2) hedging owned inventories, or 3) speculation through cash markets or the futures market.[27] Perhaps the easiest strategy to execute is margin pricing in conjunction with minimization of the cash inventory. Risk is also minimized by selling all grain bought from farmers as soon as possible. However, the grain may not be transported immediately because of the availability of forward contracts. This enables the elevator manager to earn storage returns on his facility. Margin pricing is performed by determining the best "net" bid made by merchandisers, processors, or feeders and subtracting a "fixed" handling margin to determine the bid to farmers. Several bids will be given to the local manager by the firms operating in his market. Irrespective of the time of delivery, bids will be given

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27. Richard G. Heifner, "Pricing Grains," Grain Marketing Economics, eds. Gail L. Cramer and Walter G. Heid, Jr. (New York: John Wiley & Sons, Inc., 1983), pp. 164-166.

either for grain delivered to the buyer's facility or for grain "f.o.b." seller's station. The difference is in who is responsible for scheduling and paying the cost of transportation. Thus, a "net" bid is the price per bushel the elevator manager will receive after all costs associated with the transaction are taken into account. Once the best "net" bid is determined, the "fixed" margin is then subtracted. The margin is the cost per bushel which the manager charges for handling, elevating, and merchandising the grain. Although the margin is termed "fixed", it most likely will vary with changing supply-demand conditions. Margin pricing is exhibited in Table 1.

TABLE 1. Margin Pricing at Local Elevator

	Gulf Rail	Kansas City Rail	Salina Truck	Salina Truck	Feedlot f.o.b. Local Elevator
Bid ($/bu)	4.50	4.12	3.91	3.89	3.66
Transport Costs ($/bu)	.82	.47	.21	.21	-
"Net" bid ($/bu)	3.68	3.65	3.70	3.68	3.66
"Fixed" margin ($/bu)			- .15		
Local bid to Producers ($/bu)			3.55		

A second pricing strategy, hedging grain inventories, is also a risk minimization approach in that basis risk has replaced price risk. However, it does require more sophistication on the part of the elevator manager. He must be knowledgable of futures market trading practices, as well as basis relationships -- historic and seasonal. The hedging strategy is performed by selling futures contracts in an approximately equivalent number of bushels of grain as are currently owned by the elevator. Hence, the manager is long in cash grain and short in the futures market. If the basis does not change, then losses in one market will be equal to gains in the other, less transaction and storage costs. By understanding basis behavior, the manager may be able to hedge whereby he earns storage returns and may also profit from a basis movement. If this strategy is the one used, then the local bid is based on the manager's estimate of an appropriate basis for the specific time period for which the bid is given. Entering into the basis for agricultural commodities are the following factors: 1) the commodity's overall supply and demand, 2) the overall supply and demand of substitutes, 3) geographical disequilibrium in supply and demand, 4) transportation costs, 5) transportation problems, 6) available storage capacity, 7) quality factors and conditioning facilities, and 8) expectations.[28] Although the historic basis is important to local price determination, current market conditions could significantly alter the cash bid for either a short time, or for several weeks or months. The manager must price wheat at a weaker basis than he believes he can sell it for in the cash market at a later date. Otherwise, he will lose money on storage, handling, and merchandising. Producers should also evaluate the basis to determine if the local elevator bid is a good marketing opportunity.

A third pricing strategy entails the assumption of price risk through the ownership of unhedged cash grain. The speculating elevator manager takes a position in the cash market in hopes that prices will move favorably. Such a strategy could lead to lower prices to the producer due to the higher risk

28. Commodity Trading Manual, ed. Lloyd Besant (Chicago: Board of Trade of the City of Chicago, 1982), p. 62.

assumed hy the manager.

Major Determinants of Inter-Market Price Spreads

For wheat to move hetween any two points, a price difference must exist. Spatial price equilibrium theory states that under competitive market conditions this price difference will he equal to all transfer costs.[29] If the price differential is less than transfer costs, wheat should not move. If the price spread exceeds transfer costs, arhitrage by grain traders will occur until prices return to spatial equilihrium.

Transfer costs are costs associated with transportation and merchandising. Transportation expense is normally the most significant determinant of price spreads. The merchandising margin covers all non-transport costs associated with the physical handling of the wheat (elevation, conditioning, temporary storage, etc.), as well as inventory and transaction costs. This description of transfer costs equating to price spreads may apply well to a market with several supply points (i.e. several Kansas elevators) and only one demand point (i.e. Kansas City). But in the real market, each supply point has several alternatives to consider. The hest net price from among those alternatives for each supply point will he the hasis for determining the price bid to producers. If demand points are competitive, a certain demand point will not always be the hest alternative. Hence, the price spread between a supply location and a demand location should exhibit some variability, but generally not exceed the transfer costs. However, there are other factors that influence price spreads which may cause a price spread to exceed transfer costs. Tomek and Robinson list the following as possihle factors: 1)

29. William G. Tomek and Kenneth L. Robinson, Agricultural Product Prices, 2nd ed. (Ithaca, N.Y.: Cornell University, 1981), pp. 150-151.

incomplete or inaccurate information, 2) buyer preferences, 3) trade barriers, either legal or institutional, 4) shortages of transportation equipment -- railcars, barges, etc., and 5) lack of storage space.[30] In addition, local supply-demand conditions can affect the price spread through flexibility in the merchandising margin; for example, if producers are offering large amounts of grain for sale, merchandisers may widen their margins to cover risks associated with larger inventories or to provide increased return to fixed assets. Because certain market alternatives may be more attractive than other alternatives only during part of the year, a specific price spread could also exhibit seasonality.

With regard to geographical price relationships, it is possible that government programs could have an effect.[31] Support prices and loan levels are adjusted for each local area in the total production area. Consequently, if the price level is near, or below, the support price, then prices may assume the geographical relationship established by the government program; this relationship may be greater than or less than actual transfer costs.

The foregoing discussion has assumed that the prices being compared are for wheat of identical quality and represent the same point in time. An additional component of a price spread could be the value, either a premium or a discount, of the difference in the qualities of the wheat for which destination (demand point) prices are quoted. In this respect, not only can there be variability of the qualities being compared, but the market value of a specific quality differential fluctuates over time. Similarly, if the wheat prices represent different time periods, then there should be an additional

30. Tomek and Robinson, p. 154.

31. Ibid., p. 154.

price differential which would normally approximate the "carrying" cost of owning the wheat over that time period; however, it is possible for the near-term price to be at a premium to the deferred price.

Several determinants of price spreads have been discussed. Some determinants have long-term effects, while others create short-run variability. A change in the price spread requires a change in one, or both, of the respective prices. Market participants are especially interested in how a change in the price spread affects their own individual price. According to Tomek and Robinson, a change in the cost of providing existing services will change the price at the supply point and at the demand point, assuming a competitive market structure.[32] Thus, an increase in any price spread component, while holding all else constant, should lower prices to wheat producers and raise prices at the major markets. A decrease in the spread would have the opposite effect on the respective prices. The absolute changes depend on the relative elasticities of the excess demand or supply schedules.[33] The more inelastic a schedule is relative to the other, the larger the absolute change will be. If agricultural supply is less elastic than demand, an increase in the spread is made at greater expense to producers than to purchasers. However, if transfer costs or other price spread components decrease, then producers will benefit the most. Tomek and Robinson state that "In general, a decrease in shipping costs will benefit more distant as compared with nearby producing areas."[34]

This discussion has outlined several determinants of price spreads. These determinants vary in their degree of importance, or influence. Also it

32. Tomek and Robinson, p. 130.

33. Ibid., p. 161.

34. Ibid., p. 165.

is apparent that some factors are more visible than others, for example, transportation costs versus the price effect of differences in quality at various local supply points. Developing an understanding of the price spread determinants should help market participants improve their performance.

Kansas Wheat Marketing Patterns

The marketing system for Kansas wheat is very well established. Since the state is a surplus area, the major function of the system is to get the wheat to areas of demand, i.e. processors and exporters. Depending on particular market conditions, the wheat will move to processors and exporters in varying relative proportions. Understanding patterns of movement of grain will aid in evaluating demand-price effects on local prices.

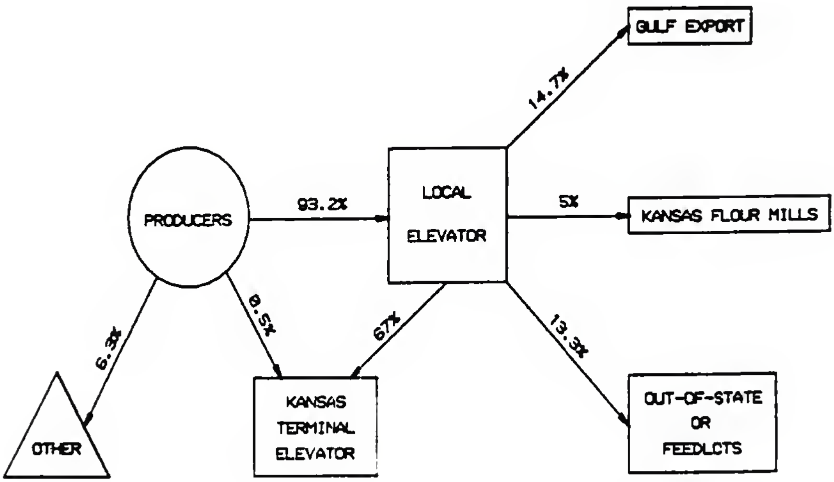
During 1977, 93.2 percent of Kansas wheat production was sold through the local country elevator.[35] Less than 0.5 percent was sold directly by farmers to terminal elevators. Figure 2 shows the movement of grain from the country elevators. The largest share, almost 67 percent, was shipped to Kansas terminal elevators. Another 14.7 percent went from country elevators to Gulf of Mexico ports for export, and about 5 percent was shipped to in-state flour mills.[36] The balance of country shipments went out-of-state or to feedlots. The mode of transportation for all country shipments was primarily rail, 83.8 percent of total movement; this was a decrease from the 92.4 percentage in 1972-1973.[37]

35. John H. Davis, "Kansas Grain Flows and Transportation Modes During 1977," Unpublished Master's Report, Kansas State University, 1980, p. 20.

36. Davis, p. 120.

37. Ibid., p. 22.

FIGURE 2. Kansas Elevator Wheat Marketing Pattern (1977)



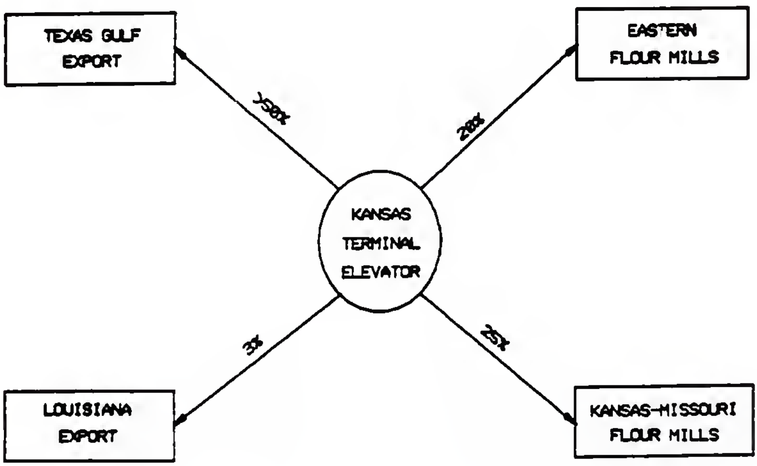
As was seen above, terminal elevators received the largest share of country elevator wheat shipments, 59.2 percent of total wheat production.[38] Figure 3 portrays shipments of wheat from the terminal elevators. Over three-fourths moved to out-of-state destinations. The export market received over 50 percent at the Texas Gulf, and about 3 percent at Louisiana ports. The remaining shipments were mostly to domestic flour millers — 25 percent to Kansas and Missouri mills, and about 20 percent to Eaatern mills.[39] These

38. Davis, p. 42.

39. Ibid., pp. 57-59.

grain shipments moved on rail, barge, and truck in proportions, 92.8 percent, 5.6 percent, and 1.6 percent, respectively.[40] Combining country elevator and terminal shipments, over 52 percent of Kansas elevator shipments moved directly to export ports in 1977.

FIGURE 3. Kansas Terminal Elevator Wheat Marketing Pattern (1977)



The Kansas Crop and Livestock Reporting Service's 1981 survey does not report movement data in the same format as the 1977 study, but does provide additional insight into the grain marketing system. The 1981 survey results are based on "marketable production," or that production for which marketing

40. Davis, p. 44.

control is held by the producer, not the landlord.

Similar to 1977, 94 percent of producer marketings was sold to the local elevator and 4 percent sold directly to terminal elevators.[41] Direct farm sales to terminals were mostly to Kansas City, Atchinson, and Wichita. Note that this gives no indication of total wheat movement through terminals.

Country elevators were classified by size into small country houses and large country houses, with 1.5 million bushels of capacity being the dividing point. Shipments from small country houses were characterized by 76 percent rail shipment, including 6 percent unit-trains, and 24 percent by truck. Large country houses used 8 percent more rail shipments, including a total of 41 percent unit-trains. Shipments from terminals compare very well to 1977 estimates. Rail provided 94 percent of total movement, while barges and trucks contributed 5 percent and 1 percent, respectively.[42] Barge transportation is only directly available to the Northeast district of Kansas. Figure 4 shows initial destinations of most of the wheat for each crop reporting district in Kansas.

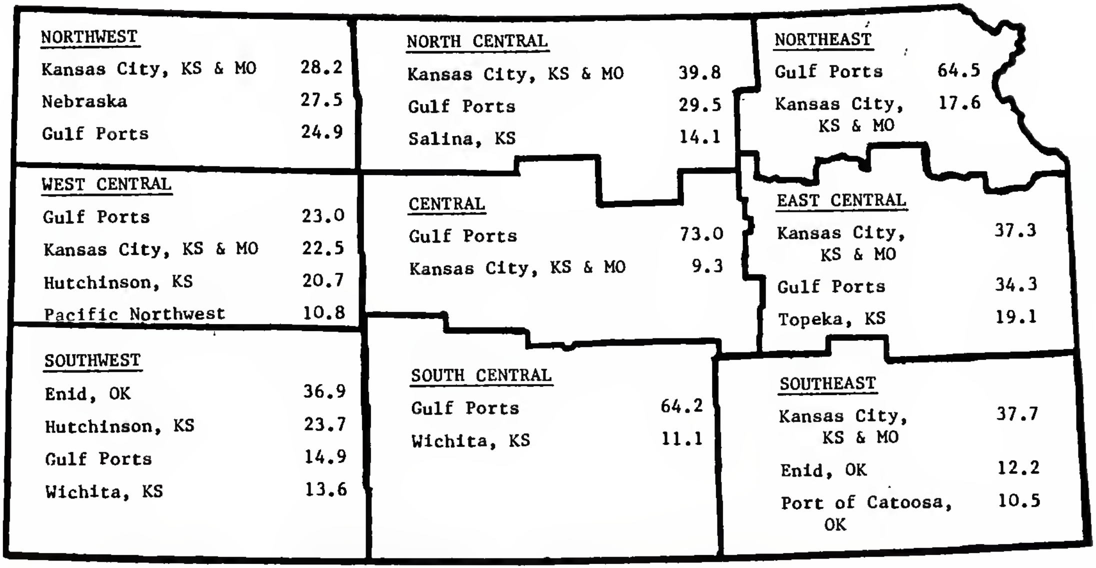
In 1981, 51.1 percent of all Kansas wheat was destined for Gulf ports. Additionally, 32 percent of shipments were transshipped at Kansas terminal elevators before going to domestic flour mills. And 9.1 percent of the wheat was shipped to Oklahoma and Texas inland terminals prior to export or sale to processors.[43] These statistics are in agreement with those found in 1977 by Kansas State University and reported earlier in this section.

41. "Kansas Grain Marketing and Transportation - Data for 1981 Crop," Kansas Crop and Livestock Reporting Service, 1983, p. 6.

42. "Kansas Grain Marketing and Transportation - Data for 1981 Crop," p. 17.

43. Ibid., p. 18.

FIGURE 4. Major Destinations for Shipments of the 1981 Wheat Crop
(Percent of Total Shipments)



Source: "Kansas Grain Marketing and Transportation - Data for 1981 Crop,". Kansas Crop and Livestock Reporting Service

VI. CHANGES IN RAIL TRANSPORTATION RATES AND SERVICES

Since transportation costs are major factors in geographical price relationships, knowledge of changes in the transportation rates and services will contribute to understanding changes in those relationships. Substantial innovation in rail rates and services has occurred since January 1981. Although the Staggers Act of 1980 was enacted in October 1980 and subsequently relaxed the regulatory environment for railroads, other factors also existed which encouraged the innovative rate making. According to the Office of Transportation of USDA, these "external influences" included: 1) "Generally depressed traffic levels . . . since early in 1980," 2) "Relative stability since 1979 in U.S. grain exports compared to rapid growth during the decade of the 1970's," 3) "Addition of 50,000 covered hopper cars during 1979 and 1980 . . .," 4) "Addition of thousands of new barges during 1979 and 1980," 5) "Considerable confusion and uncertainty . . . regarding the "legal scope" of the Staggers and Motor Carriers Acts," 6) "Considerable uncertainty . . . regarding the changing regulatory tendencies of the Interstate Commerce Commission," and 7) "A slowing down of inflationary trends in 1981 and 1982."[44] Hence, the rate innovation after 1980 most likely has been the result of some combination of excess capacity in the transportation industry and a relaxation of rail regulation by the Staggers Act.

Transit Rate Structure

Prior to passage of the Staggers Act, the transit rate structure employed by the railroads had significant effects on the Kansas wheat market. The

44. U.S. Department of Agriculture, Office of Transportation. "An Assessment of Impacts on Agriculture of the Staggers Rail Act and Motor Carrier Acts of 1980." Washington D.C. : U.S. Government Printing Office, 1982, p. 5.

transit structure allows grain to be stopped during shipment at intermediate locations for storage, processing, and/or other purposes.

Depending on the destination of a wheat shipment, transit works one of two ways. If grain is shipped to the Gulf of Mexico via an inland terminal, then the "balance of the through rate" method is applied. The originating shipper has the Gulf through rate assigned to the billing; thia rate is the cost of transporting wheat directly to the Gulf. However, the shipper has the option of stopping the shipment in-transit at a transit point and being charged the flat rate from the origin to the transit point. If and when the wheat is moved on to the Gulf at a later date, the shipper is only charged the balance of the through rate, arrived at by subtracting the previous flat rate from the Gulf through rate stated on the billing.

The proportional rate method is the second application of the transit rate structure. This method is appropriate for shipments which are not accorded the balance of the through rate. A proportional rate is the cost for shipping wheat with inbound rail billing from a transit point to a specific destination, regardless of the origin stated on the shipment's billing.

The purpose of the transit rate structure is to capture traffic from other modes of transportation. The railroads attempt this by charging relatively high rates into a transit point, but make it less expensive than other modes for outbound shipments if inbound shipment was by rail. Consequently, shipments accrue "billing", or paid-up freight, which necessitates that the wheat carry inbound billing to be competitive in outbound movement. Since "billing" has value and is connected to specific lots of wheat, the transit rate structure has an affect on geographical price relationships and on wheat marketing patterns. Depending on the average balance of the through rate at various transit points, these points will develop a certain price relationship to each other, basis the Gulf market. In addition, wheat will move differently if transportation rates are altered with respect to each other. Grain trucked to the transit point is often sold at a discount to rail-delivered wheat because of the transit rate structure.

Although transit still exists in the post-Staggers period, it has lost much of its impact on Gulf-destined wheat. This is because point-to-point rates not involving in-bound billing have been introduced over major routes, for example from Kansas grain terminal sites to Gulf export ports. Transit does, however, enable small shippers to take advantage of some of the new multi-car rates and it still applies to movements to many domestic destinations.

Volume Rates

Beginning in early 1981, the long-established rail rate structure began to transform. Previously, the transit system had developed strong inter-market relationships. The first response of the railroads to their increased freedom was to offer minimum annual volume rates for wheat shipments to the Gulf of Mexico from Kansas City; these applied only on wheat originating at Topeka, Atchison, or Kansas City. A new rate existed for each of two levels of volume. They were 78 cents per hundredweight and 87 cents per hundredweight for minimum annual volumes of 350,000 tons and 150,000 tons, respectively.[45]

45. Brian J. Maydew, "Prospects For Contract Rail Rates From Kansas Country Elevators," Unpublished Master's Thesis, Kansas State University, 1982, p. 23.

Because the grain eligible for the volume rates didn't require previous rail billing, trucked grain was no longer at a disadvantage, or discount, to rail-delivered grain if moving on to the Gulf of Mexico. Consequently, trucked grain became more competitive and more of the wheat began arriving by truck. The proportion of total receipts during the January-April period which was truck-delivered rose from a 1979-1980 average of 33.33 percent to 49.76 percent in 1981.[46] The success of the railroads' new competitive tool was quite evident. Wheat shipments from Kansas City by barge as a percent of total shipments by all modes for the April-June period dropped from a 1979-1980 average of 47.86 percent to 15.24 percent in 1981.[47]

Mileage-Based Gathering Rates

As described in the section on the transit rate structure, railroads competed with trucks via the transit system, whereby a relatively high gathering rate was charged into a transit point, but a low balance of the through rate was applied to the outbound move. However, the new minimum volume, point-to-point rates destroyed the effectiveness of the transit system for Gulf shipments. Although both truck grain and rail grain were of about equal value in Kansas City, it cost less to transport the wheat from the country into Kansas City by truck. Hence, railroads lost traffic to trucks. To become more competitive, railroads initiated mileage-based gathering rates.

Although the Union Pacific Railroad changed their gathering rates to a mileage base on April 25, 1981, it took until June 25, 1981 for most other major railroads serving Kansas points to follow suit. Whereas previous rate

46. Maydew, p. 27.

47. Ibid., p. 26.

changes had been across-the-board percentage adjustments, the new rate changes varied considerably by location. The amount of change probably was influenced by the mileage of the route in question and by the degree of competition for the traffic. Maydew provides the following summary of the restructuring of the gathering rates by the railroads operating in Kansas.[48] The Union Pacific Railroad, as stated earlier, initiated rate changes on April 25, 1981 when they lowered rates from country points to Kansas City, Topeka, and Salina. A random sample by Maydew showed a 30 percent average reduction, in a range from 53 percent to 8 percent. May 10, 1981 saw the Missouri Pacific Railroad Company lower their gathering rates an average 31 percent, with a range of 47 percent to 19 percent less. These lower rates also carried with them major restrictions on services -- no transit, diversion, inspection, or reconsigning between points. The Missouri-Kansas-Texas Railroad Company decreased their rates from Kansas local points to Kansas City by an average 35 percent on May 18, 1981; the range was from 47 percent less to 22 percent less.

The Burlington Northern Incorporated (BN) and the St. Louis and Southwestern Railroad (Cotton Belt) also published lower gathering rates. The BN rates, effective May 27, 1981, averaged 23 percent less; however, some locations incurred higher rates, as the range was from 9 percent more to 40 percent less. They did not allow inspection in transit and required the traffic to remain on BN in order to apply previous billing. It was not until June 10, 1981 that the Cotton Belt entered into mileage-based gathering rates to Kansas City. Their reductions ranged from 16 percent to 52 percent less, averaging 36 percent less.

48. Maydew, pp. 28-31.

According to Maydew, the Atchison, Topeka, and Santa Fe Railway Company approached the competition in a different manner.[49] Instead of lowering their gathering rates significantly, they introduced lower export rates from country points on April 18, 1981; gathering rates were reduced from 7 to 9 percent on April 22, 3 days before the Union Pacific introduced their mileage rates. The Santa Fe maintained this rate structure until June 11, 1981. At that time, it published mileage-based rates, but ones which were still considerably higher than those of its competitors. On June 25, 1981, the Santa Fe lowered gathering rates "to meet those of its competitors mainly at those points served by other railroads."[50] However, on October 13, 1981, Santa Fe decreased the gathering rate at several more of its origins.[51]

Maydew found that the historic modal division of truck and rail receipts at Kansas City had returned as a result of new, lower, mileage-based gathering rates.[52] Intermodal and inter-railroad competition had succeeded in diminishing the cost to shippers of transporting wheat to Kansas City.

Multi-Car Rates

In addition to meeting the truck competition to Kansas City and other terminals through mileage-based gathering rates, the railroads attempted to compete with the truck-barge export competition with lower export rates on wheat from country points. These were multi-car rates which required 25 cars or more, depending on the specific railroad. Because these rates demanded

49. Maydew, p. 30.

50. Ibid., p. 31.

51. from Supplement No. 25 to "Kansas City Board of Trade Grain Rate Book No. 45" The Board of Trade of Kansas City Missouri, Inc.

52. Ibid., p. 34.

high volumes of grain and large facilities, they were, for the most part, only feasible for the terminal elevators; however, there probably were some large country elevators which at times could fill a unit-train.

The Santa Fe was the first to issue such multi-car rates from Kansas points. On April 18, 1981, 30- and 60-car export rates became effective which were an average 20 percent less than previous single-car export rates.[53] During the month of May, both the Missouri Pacific and the Missouri-Kansas-Texas Railroad Company (MKT) introduced 25-car export rates that were an average 17 percent and 22 percent, respectively, lower than previous single-car rates.[54] On June 10, 1981, 30-car export rates from Cotton Belt origins to the Gulf were established which averaged 19 percent less than previous single-car rates.[55] The Burlington Northern did not follow suit on Gulf export rates (60-car) until June 5, 1981, although they had them to the West Coast since earlier in the year.[56] The Union Pacific had wheat multi-car rates only to the West Coast during 1981 from Kansas points.[57]

Perhaps because country elevators were not equipped to use unit-trains (25-60 cars), or because of the competition of tbe truck-terminal-rail combination, the railroads began to institute a new set of multi-car rates in 1982. These new rates are much more practicable for the country elevators to use. Ratber than having to ship 25 or more cars at one time from the country point,

53. Maydew, p. 30.

54. Ibid., p. 29.

55. Ibid., p. 30.

56. from Supplement No. 18 to the "Kansas City Board of Trade Grain Rate Book No. 45."

57. "Kansas City Board of Trade Grain Rate Book Nos. 45 and 46."

they can accumulate a sufficient number of cars (associated billing) at transit points through 1-car or 5-car individual shipments, depending on their respective railroad's tariff.

The Santa Fe led the way on February 12, 1982 with a multi-car Gulf export rate for a "minimum of 5 cars and 25 from a transit point."[58] Restrictions included no transit at points east of Emporia, Kansas (Kansas City or Topeka) and shipment only to Santa Fe ports. Ten days later, the Burlington Northern issued an export rate for 5-car through, 25-car direct line transit(5/25). In addition, rates for 27-car and 54-car shipments were available for 5 cents and 10 cents per hundredweight less than the 5/25 car rate.[59] On February 26, 1982, the Missouri Pacific also published 5/25 car rates from Kansas origins to only Missouri Pacific Gulf ports served directly by the Missouri Pacific; transit applied, but the highest rate from origin to the Gulf or from transit point to the Gulf had to be protected.[60] The Union Pacific did not adjust their rates as much as the other railroads had. Instead of 5/25 car rates, they instituted 1/25 car rates which were somewhat higher than the 5/25 car rates. February 28, 1982 was the effective date and the rate required direct line transit only to Kansas City Southern and to Louisiana-Arkansas railroads' ports; Galveston and Houston ports were available via the MKT on March 1.[61] The MKT, on June 17, 1982, published 5-car direct rates to the Gulf which also allowed 5-car shipments via transit.[62] The Cotton Belt

58. from Supplement No. 3 to the "Kansas City Board of Trade Grain Rate Book No. 46."

59. Ibid.

60. from Supplement No. 3.

61. Ibid.

62. from Supplement No. 8.

introduced rates for 25-car Gulf shipments from transit points, effective June 14, 1982 and expiring November 30, 1982.[63] On January 1, 1983, the Santa Fe added a 1/5 car rate which was somewhat lower than their previous rates.[64]

When railroads attempt to draw more traffic, they offer lower rates and/or better services. Both have occurred since deregulation. The published rates have visibly dropped at virtually all locations in Kansas for multi-car Gulf export shipments. Also evident is the various levels of services accompanying the different rates. The major distinguishing factor is the number of cars involved and the applicable transit restrictions. However, there are other tariff provisions which influence the effective rate, or the actual transportation cost per unit of wheat. Charges assessed by the railroad for inspection stops and switching can be significant. For shipppers using private cars, the mileage allowance can alter the total shipping cost. Therefore, shippers must evaluate all relevant factors in order to accurately arrive at the most competitive effective rate.

These new multi-car rates have not just benefitted shippers in lower rates. The efficiencies they afford have furnished the railroads with operating economies that reduce their costs. Such multiple-car shipments "minimize shipment delays enroute, increase shipment size from single origin to single destination, permit more favorable matching of power units with load size, and allow long-distance shipment with a minimum of interlining and associated delays."[65] Increased resource efficiency is a likely benefit of the new operating environment of the railroads.

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63. Ibid.

64. "Kansas City Board of Trade Grain Rate Book No. 48."

65. Maydew, p. 37.

Contract Rates

The previous sections discussed the transition of published tariff rates from single-car export and transit-based gathering rates to the new multiple-car export and mileage-based gathering rates. It is important to remember that these are the published rates available to any shipper that can meet the tariff provisions. However, during the same transition period described above, contract rates, as permitted by the Staggers Rail Act of 1980, have developed as a strong influential force in the Kansas wheat market. These "secret" rates provide some shippers with even lower transportation costs and consequently, give them an advantage in bidding for wheat.

Authorization for shipper/carrier contracts in the Staggers Act also has permitted innovations in rail grain rates. Although the ICC had encouraged contracting since 1978, it took Congressional approval through the Staggers Act before shippers and carriers really began negotiating.[66] Contracts are cancellable if termed a "destructive competitive practice"; otherwise, contracts are intentionally difficult to nullify.[67] Contracts are authorized for all commodities, not just grains. The ICC Chairman, Reese Taylor, testified on September 1, 1983 that 9,000 contract rates had been filed since the Staggers Act was instituted, and that 13 percent of those involved grain shipments.[68]

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66. Phyllis D. Altrogge, "Railroad Contracts and Competitive Conditions," Transportation J., 21(1981): 37.

67. "Congress Passes Rail Deregulation Bill, Sends It to President Carter," Traffic World, October 6, 1980, p. 129.

68. Testimony presented before the Senate Subcommittee on Surface Transportation at Hutchinson, Kansas on September 1, 1983. Senator Nancy Kassebaum chaired this oversight hearing on the Staggers Rail Act of 1980.

Since contract rates are secret, it is not possible to describe how they have behaved since deregulation. However, they do play a part in the Kansas wheat market. Because of their impact, it was necessary to investigate the effect on those locations included in this paper. Based on price relationships, it was evident that a contract rate existed in Salina beginning in the Spring of 1981. Through contact with trade people, an estimate was arrived at for this rate; from May 1981 to December 1982, a rate of 90 cents per hundredweight rate was used; 80 cents per hundredweight was applied throughout 1983. Although this is the only contract rate incorporated in the analyses, it by no means is the only contract rate in the Kansas wheat market.

Comparison of Changes in Transportation Costs at Study Locations

Up to this point, this cbapter has discussed the evolution of the rail transportation rate structure in the Kansas wheat market. It has provided a description of railroad services, and has described rate level changes since deregulation. To get a more detailed look at the behavior of rate levels over the study period, the rail rates from the fourteen local elevators to Kansas City and to Gulf export ports were examined.

The rail rates used in the analyses are primarily tariff rates as listed in the Kansas City Board of Trade Grain Rate Book and its associated supplements. The rates have not been adjusted for the inherent value of the additional services (inspection stops, private-car allowances, switching cbarges, etc.) permitted (or not permitted) by a tariff. The value of these services are unique to specific movements and therefore are not within the scope of this analysis. However, the tariff rates have been adjusted for fuel surcharges which are assessed on the total freight bill. To incorporate the analysis of rail rates into the overall study, rates have been converted from a hundredweight basis to a bushel basis. This was done by taking 60 percent of the tariff rate (plus any applicable percentage fuel surcharge) and then rounding off to the nearest one-half cent to arrive at an approximate effective rate.

A. Rail Rates to the Gulf of Mexico Since over half of Kansas wheat production is exported, the cost of transporting wheat to Gulf ports is very important, especially to the producers. Because of Kansas' geography, rail is the primary mode of transportation. Thus, examination of the rail rate to the Gulf is the best measure of transport cost for export.

In compiling the effective Gulf rate series, rates were selected to represent major market activity throughout the time period. Prior to the passage of the Staggers Act, only single-car rates were available from Kansas points. As indicated in the early sections of this chapter, major changes in rail rates were not really noticeable on a broad scale until Spring 1981. Therefore, single-car rates continued to be used into May 1981. However, beginning at that time, changes in the rate structure occurred. For the most part, grain began to move at costs comparable to multi-car rates.

In some cases, the cheapest transport cost was attained by trucking into a terminal where a favorable rail contract rate to the Gulf existed. Examination of price spreads indicated the locations at which the trucking may have been occurring. In cases where the combination of the estimated contract rail rate and the published truck rate (Kansas Motor Carriers Association, Motor Freight Tariffs 50-G and 50-H) resulted in a Gulf rate lower than the railroad tariff rate, the truck-rail combination rate was used. Trade information indicated that a rail contract existed from Salina, Kansas to Gulf destinations. With this option available, several of the locations under study found it feasible to use the truck-rail combination for exporting wheat to the Gulf. Eventually, multi-car rail rates became competitive with the truck-rail combination rate at these locations.

With regard to the fourteen locations under study, the following rate options were selected from May 1981 to the end of the study period. For Seward, Finney, Ford, Scott, Pratt, and Shawnee, published multi-car rates were applied to the whole period. Cheyenne, Mitchell, Cloud, and Marshall used the truck-rail combination until March 1982 at which multi-car rates took over for the rest of the study period. Thomas, Sheridan, and Russell followed the same pattern as Cheyenne, et al, except the switchover month was April instead of March. The multi-car rate used in 1983 was the 25-car rate which amounted to an 89 percent discount rate; selection of this particular rate was based on information from trade people. Again, the Saline rate from May 1981 to the end of the study period was the estimated contract rate out of Salina.

Table 1 in Appendix A lists quarterly averages of the approximate effective rate to the Gulf from each elevator for the period January 1, 1977 to June 30, 1983. The elevators are grouped by geographical areas to facilitate comparison within regions and between regions. The study period has two distinct phases -- one of steadily increasing rates and one of generally decreasing rates characterized by irregular adjustments.

Steadily increasing rates occurred through the study period until the second quarter of 1981. Rate increases were the result of both tariff increases and fuel surcharges. Usually tariff increases and fuel surcharges were approved on a percentage basis by the ICC. After applying a percentage increase to the old tariff rate, the new value was rounded to the nearest one-half cent per hundredweight to arrive at the new rate. Then any applicahle fuel surcharge was added to the total freight hill. Hence, the absolute change in a rate as a result of an across-the-hoard percentage assessment depended upon the relative level of the original rate.

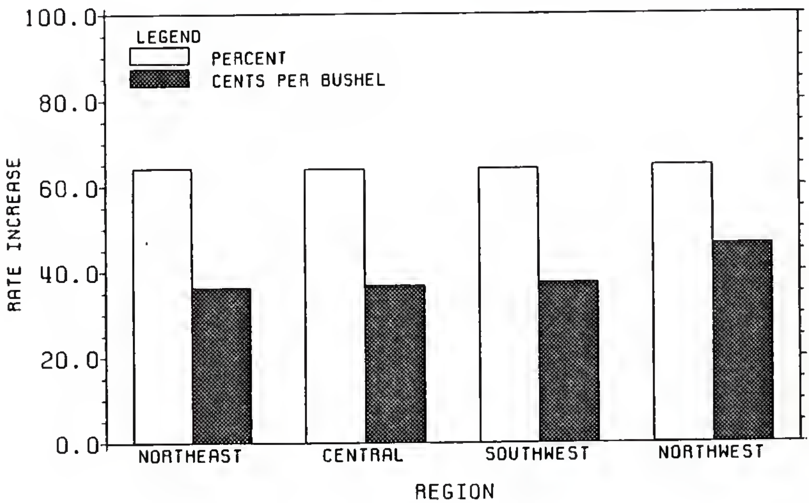
The most ohvious characteristic of the rail rates within each region for the period hefore April 1981 is that rates increase as length of haul increaes. Examination of the rate change from one quarter to the next reveals that rate changes are ahout equal among all of the locations within a region, for hoth the absolute change and the percentage change. The Seward location in Southwest Kansas is an exception since its rate was over 11 cents per hushel lower than the other four Southwest locations' rates; equal percentage increases resulted in lower ahsolute increases.

Tahle 2 in Appendix A summarizes the quarterly average rail rates from each of four regions. These rates demonstrate that the Northeast area of Kansas had the lowest cost of exporting wheat to the Gulf of Mexico in 1977. The Northeast was followed hy the Central region, then the Southwest region, and finally by the Northwest section of the state. Since, rate increases were mostly prescrihed on a percentage hasis, locations with relatively large initial rates incurred larger ahsolute increases than locations with smaller rates. Figure 5 portrays this effect.

For the period, first quarter-1977 to first quarter-1981, single-car rates in all four regions increased ahout 64 percent (63.9 - 64.7). The ahsolute change was similar for the Northeast, Central, and Southwest regions;

they were 36.3, 36.8, and 37.4 cents per bushel, respectively. In the Northwest section of Kansas, single-car rail rates increased 46.6 cents per bushel in the period from January 1, 1977 to April 1, 1981, or 9.6 cents per bushel more than the average increase of the other three regions.

FIGURE 5
INCREASE IN GULF EXPORT RAIL RATE FROM
FIRST QUARTER-1977 TO FIRST QUARTER-1981



Rate analysis for the period before April 1, 1981 shows a general increase in single-car Gulf export rates of about 64 percent for all study regions. The rate structure was stable except for relatively larger increases for origins with the larger initial rates. However, the new competitive environment and the innovative rate making which developed in the first half of 1981 suddenly upset that stability in rail rates. Contract rates, multi-car export rates, and mileage-based gathering rates all contributed to shifts in the rate structure after April 1, 1981.

Examination of rate changes in Appendix A, Table 1 for the second quarter of 1981 shows there were substantial declines in the cost of transporting wheat to Gulf ports. This downward movement in rates continued into the third quarter of 1981, except for the Pratt location. The contract rate from Salina had a significant influence on these two quarters' changes, except in the Southwest region and in Shawnee.

The amount of rate decrease varied considerably among the fourteen locations. Table 2 highlights the total decrease occurring over the second and third quarters of 1981. The locations are listed by the total amount of cost savings achieved over the two quarters. The order of the listing indicates that terminal locations (Saline, Shawnee) and those locations which had the truck-rail combination rate applied to them benefitted the most in cost savings. The locations in the Southwest region had the least amount of savings over this particular two-quarter period. Especially note the quite small rate decrease at Seward; this probably was because Seward already had a relatively low export rate (81.4 cents per bushel) when compared to other study locations. When these decreases are evaluated on a regional basis (see Table 3), it shows that the Northwest, Central, and Northeast regions did not differ substantially. In contrast, the Southwest decreased around 10 cents per bushel less than the other three regions. So within a year of the passage of the Staggers Act, the approximate effective rate to export Kansas wheat had dropped from 5.4 to 35.3 cents per bushel at the fourteen locations included in the study. This range narrows somewhat when regional averages are observed — 14.9 to 26.2 cents per bushel in the Central region.

TABLE 2. Decrease in the Effective Cost of Transporting Kansas Wheat to the Gulf of Mexico from First Quarter-1981 to Third Quarter-1981

Location	Decrease in Cost of Transportation From Previous Quarter 2nd Qtr.-1981	3rd Qtr.-1981	Total
	c/bu.	c/bu.	c/bu.
Saline	24.6	10.7	35.3
Sheridan	22.6	6.2	28.8
Shawnee	23.6	4.2	27.8
Mitchell	20.8	7.0	27.8
Russell	19.5	6.8	26.3
Cloud	18.8	6.5	25.3
Thomas	19.5	4.8	24.3
Cheyenne	17.6	2.7	20.3
Marshall	15.5	4.3	19.8
Scott	16.0	2.8	18.8
Pratt	8.8	9.5	18.3
Ford	13.8	2.5	16.3
Finney	13.5	2.3	15.8
Seward	2.9	2.5	5.4

Table 4 reports the total decrease in the export rate from the first quarter of 1981 to the second quarter of 1983. The rate differentials are between single-car rail rates in 1981 and multi-car rail rates in 1983. The five locations with the largest rate reductions are either in the Northwest region or very near to terminal elevators. Seward in the Southwest had the smallest decrease in its rail export rate (16.4 cents per bushel), but its rate remained smaller than the rate from three of the other four locations in the Southwest. Export rates declined 46.2 percent and 44.3 percent

TABLE 3. Regional Averages of the Decrease in the Effective Cost of Transporting Kansas Wheat to the Gulf of Mexico from First Quarter-1981 to Third Quarter-1981

	Region			
	Northwest	Central	Northeast	Southwest
Decrease in Cost (c/bu.)	24.4	26.2	23.8	14.9

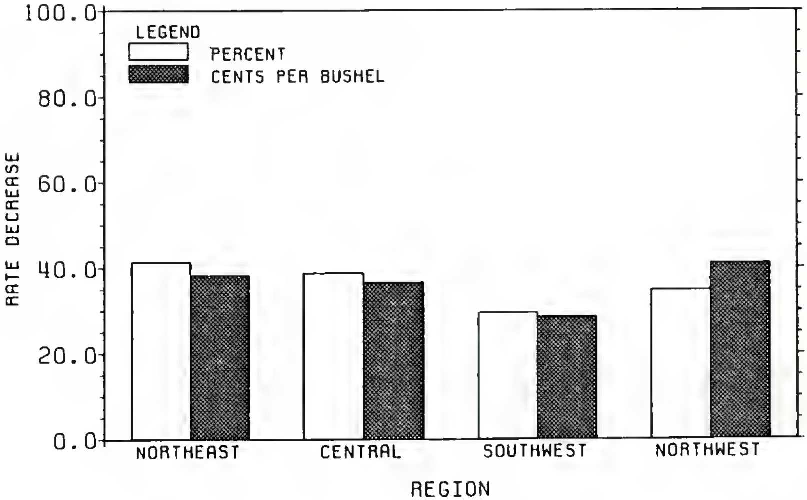
respectively at Saline and Shawnee locations. Figure 6 displays the amount of decrease in rail export rates by region on a cents-per-bushel basis and as a percentage. On a cents-per-bushel basis, the locations in the Northwest averaged the largest decline in export rates (41.0), followed by the Northeast region (38.3), the Central region (36.6), and the Southwest region (28.6). Although the Northwest area had the largest absolute rate decrease, it had only the third highest percentage decrease. Despite the significant difference between the rate decreases in the Northwest and in the Southwest, the geographic relationship in the rail export rates at the end of the study period remained similar to the relationship which existed at the beginning of the study period in 1977 (see Appendix A, Table 2). Lowest rates remained out of the Northeast region, with the Central, the Southwest, and the Northwest regions each having progressively higher rates. Of the fourteen individual locations, Cheyenne continued to have the highest rate, 84.0 cents per bushel, while Saline and Shawnee had the two lowest rates at 48.0 and 49.5 cents per bushel, respectively (Appendix A, Table 1). The Saline rate is the estimated contract rate.

TABLE 4. Decrease in the Effective Cost of Transporting Kansas Wheat to the Gulf of Mexico from First Quarter-1981 to Second Quarter-1983

Location	Rail Rate		Rate Change	
	1st Qtr.-1981	2nd Qtr.-1983	Absolute	Percentage
	c/bu.	c/bu.	c/bu.	%
Sheridan	114.8	71.6	43.2	37.6
Saline	89.3	48.0	41.3	46.2
Cheyenne	124.3	84.0	40.3	32.4
Thomas	115.3	75.8	39.5	34.3
Shawnee	88.8	49.5	39.3	44.3
Pratt	94.3	56.5	37.8	40.1
Marshall	96.8	59.5	37.3	38.5
Mitchell	96.8	59.5	37.3	38.5
Scott	104.8	69.5	35.3	33.7
Cloud	94.3	59.5	34.8	36.9
Russell	97.3	64.5	32.8	33.7
Ford	96.8	67.8	29.0	30.0
Finney	101.8	77.5	24.3	23.9
Seward	81.4	65.0	16.4	20.1

This analysis has shown that the effective rate to transport Kansas wheat to the Gulf of Mexico trended upward until around May 1981 and then proceeded to adjust downward in an irregular pattern across the state. Using Figure 5 and Figure 6, comparisons can be made between the absolute rate increase of the first seventeen quarters of the study period and the absolute rate decrease of the last nine quarters of the study period. For both the Northeast region and the Central region, the rate increase and the rate decrease were virtually equivalent. This is not true for the other two regions. In the Northwest, the rate decrease was 5.4 cents per bushel less than the preceding rate increase. The increase was greater than the decrease

FIGURE 6
DECREASE IN GULF EXPORT RAIL RATE FROM
FIRST QUARTER-1981 TO SECOND QUARTER-1983



in the Southwest region by 8.8 cents per bushel. Hence, the Northeast region and the Central region came closest to returning to early 1977 rate levels for exporting wheat to the Gulf of Mexico.

Nominal values of rail rates were used in the analyses discussed above. To determine the size of rate changes in real terms, nominal rates were deflated by the "Prices Paid by Farmers Index (PPBFI)," representing all commodities, services, interest, taxes, and wage rates. Table 5 lists the deflated rail rates of the four regions for the first quarters of 1977 and

1981 and the second quarter of 1983; also listed is the rate change between each of the latter periods and the first quarter of 1977. The purpose of this table is not to compare regions to each other, but to compare real rate changes to nominal rate changes. Whereas nominal rates increased about 64 percent through the first quarter of 1981 (Figure 5), in real terms, rates only increased about 10 percent. Hence, the cost of transporting Kansas wheat to the Gulf rose faster than the average cost of other goods and services used by farmers. The results of the analysis on nominal rates led to the observation that nominal rail rates returned to, or almost to, early 1977 levels by June 1983. But when the rates are adjusted for inflation, as measured by the PPBFI, a significant rate decrease is found for all regions; the decrease ranged from 16.9 to 24.2 cents per bushel. Therefore, real export rail rates from the fourteen study locations decreased in a range of 28.6 to 40.3 percent when the locations are aggregated by regions.

TABLE 5. Changes For Two Selected Periods in the Regional Export Rail Rates, Deflated by PPBPI*

	Deflated Rail Rate			Rate Change From			
Region	1st Qtr.-1977 PPBFI = 99	1st Qtr.-1981 PPBPI = 148	2nd Qtr.-1983 PPBPI = 160	1st Qtr.-1977 to 1st Qtr.-1981		1st Qtr.-1977 to 2nd Qtr.-1983	
	c/bu.	c/bu.	c/bu.	c/bu.	%	c/bu.	%
Northwest	72.4	79.8	48.2	7.4	10.2	-24.2	-33.4
Northeast	57.1	62.7	34.1	5.6	9.8	-23.0	-40.3
Central	58.2	63.8	36.2	5.6	9.6	-22.0	-37.8
Southwest	59.0	64.7	42.1	5.7	9.7	-16.9	-28.6

*Prices Paid By Farmers Index: Council of Economic Advisers

B. Rail Rates to Kansas City Under the transit system which existed prior to deregulation, virtually all locations in Kansas could ship grain to the Gulf of Mexico via Kansas City or other terminals, and still pay the same total transportation rate as if the grain had been shipped directly to the Gulf. Thus, rail rates to Kansas City developed a geographical relationship which approximated the distance to Kansas City, but which were generally higher than truck rates. However, the new rail rate structure arising after passage of the Staggers Act brought rail rates to Kansas City more in line with truck rates. The following analysis provides a measure of this adjustment in rail rates.

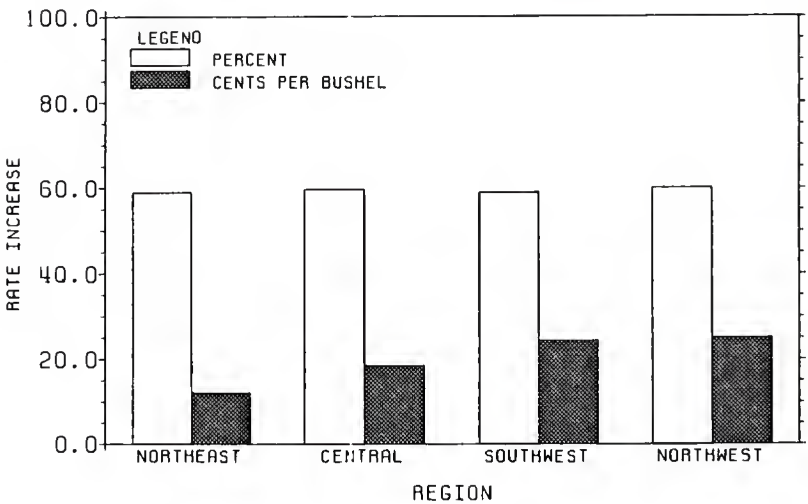
All rates to Kansas City are calculated from the tariff rates published in the Kansas City Board of Trade Grain Rate Book and supplements. The rates are for single-car shipments; however, there may exist contract rates to Kansas City from some locations for one or more cars. As was the case with the effective rate to Gulf ports, the rates to Kansas City have two distinct phases. The first phase exhibits steadily increasing rates, while the second phase is characterized by rates adjusting to a lower level. In the first phase, the rates charged by the railroads serving a location were usually equal; this was a product of rate bureau practices. Consequently, there was only one rate to choose from at any one time. In contrast, in the second phase, there was often more than one rate from which to select. Railroads did not necessarily have the same rate level as each other and sometimes they had more than one type of rate. The rail rates selected for the analysis in the second phase were the lowest rates available to the specific elevator for which price information was collected. Hence, these rates include mileage-based gathering rates and those rates which evolved afterwards. The mileage-hased gathering rates were introduced by several railroads from April 25, 1981 to June 25, 1981. Therefore, the second phase is considered to he from the second quarter of 1981 to the end of the study period.

Tahle 3 in Appendix A lists the approximate effective rail rate to Kansas City hy quarterly averages for the period January 1, 1977 to June 30, 1983. Again, the fourteen locations are aggregated into regions to facilitate comparisons. The regional averages are provided in Appendix A, Table 4.

Because of the way transit applied prior to deregulation, the rail rate to Kansas City was tied to the through rate to the Gulf of Mexico. Compare for each location the increases in the rail rates to Kansas City and to the Gulf for the period prior to April 1981 (Appendix A, Table 1 and Tahle 3). These rates rose at a fairly proportionate rate. The regional averages in Appendix A, Tahle 4 show that the effective rail rate to Kansas City hecame larger as the origin moved farther west in the state. Especially note that in 1977, there was roughly a 10.5 cent per hushel differential between the Northeast region and the Central region; there was also ahout a 10.5 cent rate difference between the Central region and each of the Southwest and Northwest regions.

The rates to Kansas City were suhject to the same percentage increases as were the Gulf export rates for the study period prior to April 1981. Therefore, it would be expected that rates to Kansas City from each of the study locations would rise approximately the same percentage, hut differ in the amount of ahsolute increase. It would also he expected that the percentage increase in the rail rates to Kansas City he very similar to the percentage increase of around 64 percent found for the Gulf export rates. Figure 7 illustrates that this was the case. The four regions had increases in their rail rates to Kansas City in a range of 59.0 to 60.0 percent. However, the range of absolute rate increases was much wider. The Northeast region had only a 12.1 cent per bushel increase, while the Central region experienced an 18.5 cent per bushel increase. They were followed by the Southwest and the Northwest which had rates of 24.3 and 25.0 cents per bushel, respectively, higher than they were in the first quarter of 1977.

FIGURE 7
INCREASE IN RAIL RATE TO KANSAS CITY FROM FIRST QUARTER-1977 TO FIRST QUARTER-1981



After April 25, 1981, the railroads started implementing new, lower rail rates into Kansas City which were mostly mileage-based. Examination of the quarterly averages shows that significant decreases had occurred by the third quarter of 1981 for most study locations. The decreases are listed in Table 6. There doesn't appear to be a pattern between the amount of rate decrease and the region in which the associated location belongs. This may be due to two reasons. The first reason relates to the railroads which serve the fourteen locations included in the study; that is, the various railroads adjusted their rates at different times and that may influence which locations had the larger decreases. Another reason, which may be more likely, is that the individual adjustments for each location possibly were based on the amount of competition for the traffic. But overall, the rates had to adjust more to the alternative cost of transporting wheat by truck.

Graphs of rail rates to Kansas City show that the rates behaved differently among the fourteen locations over the period from the fourth quarter of 1981 to the second quarter of 1983. Therefore, only the change from the first quarter of 1981 to the second quarter of 1983 is examined in detail. Table 7 lists the rail rates for those two periods and the amount of change between the two levels; the locations are ordered according to absolute difference. The absolute decrease in the rate to Kansas City ranges from 8.5 to 17.7 cents per bushel, while the percentage decrease ranges from 14.6 to 37.9 percent. Ford had the smallest decrease in the rail rate in both absolute and percentage terms. The two Northeast locations, Marshall and Shawnee, had the next smallest absolute decreases, but had the two largest percentage decreases. The other locations do not appear to have any significant relationship among them. However, Figure 8 displays some interesting

TABLE 6. Decrease in the Effective Cost of Transporting Kansas Wheat to Kansas City by Rail from First Quarter-1981 to Third Quarter-1981

Location	Rate Decrease c/bu.
Seward	24.4
Pratt	20.3
Russell	20.3
Thomas	17.4
Mitchell	17.4
Saline	16.9
Scott	14.4
Marshall	14.4
Cheyenne	13.8
Sheridan	13.4
Ford	13.3
Finney	10.3
Shawnee	7.7
Cloud	2.4

results based on regional averages. While the absolute decrease becomes larger (from 11.1 to 14.9) as the origin moves farther west, the percentage decrease becomes smaller (from 34.0 to 22.3). A reason for this may be that truck competition on the shorter hauls forced the railroads to make a relatively larger adjustment to the rail rate into Kansas City from those locations in Northeast and Central Kansas. Figure 7 and Figure 8 compare the absolute rate increase prior to the introduction of mileage-based gathering rates and the absolute rate decrease from the introduction period to the second quarter of 1983. The Southwest and the Northwest had about the same amount of increase and then had equal decreases. However, the decreases were 9.4 to 10.1 cents per bushel less than the previous increases. The Northeast

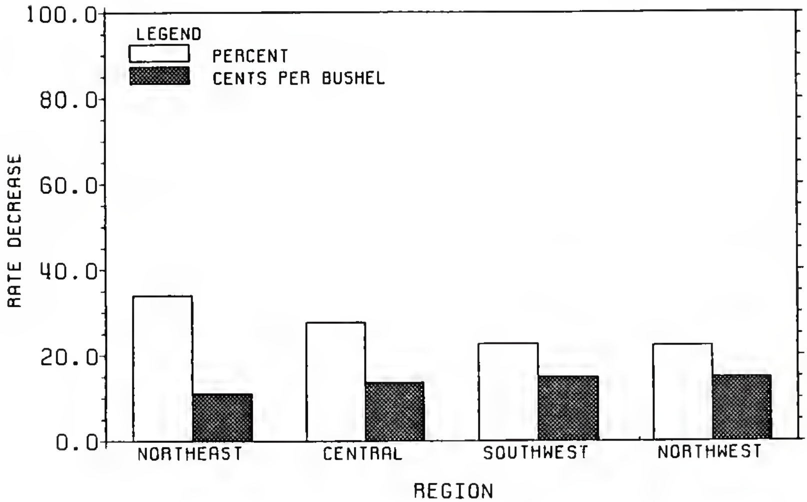
TABLE 7. Decrease in the Effective Cost of Transporting Kansas Wheat to Kansas City by Rail from First Quarter-1981 to Second Quarter-1983

	Rail Rate		Rate Change	
Location	1st Qtr.-1981	2nd Qtr.-1983	Absolute	Percentage
	c/bu.	c/bu.	c/bu.	%
Finney	69.8	52.1	17.7	25.4
Seward	76.4	59.0	17.4	22.8
Thomas	67.9	51.0	16.9	24.9
Russell	55.3	39.0	16.3	29.5
Scott	67.9	52.3	15.6	23.0
Pratt	55.3	40.0	15.3	27.7
Cheyenne	72.3	57.5	14.8	20.5
Mitchell	48.4	35.0	13.4	27.7
Cloud	45.9	33.0	12.9	28.1
Sheridan	59.9	47.0	12.9	21.5
Saline	48.4	36.0	12.4	25.6
Shawnee	29.8	18.5	11.3	37.9
Marshall	35.4	24.5	10.9	30.8
Ford	58.3	49.8	8.5	14.6

regained most of its earlier increase; the rail rate decreased 11.1 cents per bushel after it had increased 12.1 cents per bushel. The Central region recovered about 74 percent of its rate increase of 18.5 cents per bushel; the rate dropped 13.7 cents per bushel. Because the Northeast and Central regions had the larger rate decreases relative to their earlier rate increases, the geographical relationship among the rail rates to Kansas City became more pronounced. Whereas the regions had been differentiated by about 10.5 cents per bushel in the first quarter of 1977, they were differentiated by about 15 cents in the second quarter of 1983 (Appendix A, Table 4).

Although the cost of transporting wheat to Kansas City was still higher

FIGURE 8
DECREASE IN RAIL RATE TO KANSAS CITY FROM FIRST QUARTER-1981 TO SECOND QUARTER-1983



in 1983 than in 1977 in nominal terms, the actual cost in real terms decreased substantially. Table 8 lists the rail rates for three selected periods in real terms as deflated by the PPBFI. Rail rates to Kansas City rose through the first quarter of 1981 from 6.3 to 7.1 percent in real terms as compared to the 59.0 to 60.0 percent increase in nominal rates. Thus, transportation cost to Kansas City rose faster than the average cost of other goods and services used by farmers. Rail rates in real terms for the second quarter of 1983 were from 23.0 to 35.3 percent lower than the rates were in early 1977.

TABLE 8. Changes For Two Selected Periods in the Regional Rail Rate to Kansas City, Deflated by PPBFI*

Region	Deflated Rail Rate 1st Qtr.-1977 PPBFI = 99	Deflated Rail Rate 1st Qtr.-1981 PPBFI = 148	Deflated Rail Rate 2nd Qtr.-1983 PPBFI = 160	Rate Change From 1st Qtr.-1977 to 1st Qtr.-1981		Rate Change From 1st Qtr.-1977 to 2nd Qtr.-1983	
	c/bu.	c/bu.	c/bu.	c/bu.	%	c/bu.	%
Northwest	42.1	45.1	32.4	3.0	7.1	-9.7	-23.0
Northeast	20.7	22.0	13.4	1.3	6.3	-7.3	-35.3
Central	31.3	33.4	22.4	2.1	6.7	-8.9	-28.4
Southwest	41.6	44.3	31.6	2.7	6.5	-10.0	-24.0

*Prices Paid By Farmers Index: Council of Economic Advisers

To summarize, it was found that all four regions of the state experienced very similar percentage increases in effective export rail rates and in rail rates to Kansas City over the period January 1, 1977 to April 1, 1981. The absolute changes varied according to the relative level of the rate at each specific location. With regard to the Gulf export rates, the Northwest incurred the largest increase which was 9.0 cents per bushel more than the next largest increase in the Southwest (Figure 5). However, at the end of the study period in 1983, the Gulf export rates had decreased regionally between 28.6 and 41.0 cents per bushel since the first quarter of 1981. For the same period, rates to Kansas City decreased regionally between 11.1 and 14.9 cents per bushel. The Northwest received the largest absolute decreases in both the export rate and the rate to Kansas City. Although the Southwest had a decrease in the rate to Kansas City equal to the Northwest's rate decrease, the Southwest region had the smallest decline in the export rate; the decrease was 8.0 cents per bushel less than the decrease for the Central region and

12.4 cents per bushel less than in the Northwest. For those locations included in the study, the Northeast region had a larger absolute decrease than the Central region did for export rates, but the opposite was true of the rail rate to Kansas City. Overall, it appears that most of the cost reduction in shipping wheat to Gulf ports came in the movement from terminals to the Gulf since the decrease in rail rates to Kansas City were only about 40 percent as large as the decrease in rates to the Gulf. Hence, the conclusion can be made that the market for transportation services adjusted rail rates into a relationship different from the historic relationship.

VII. PRICE SPREAD CHARACTERISTICS

Although supply and demand determine the general price level in the Hard Red Winter wheat market, surplus and deficit areas are characterized by geographical price relationships. The difference in the price at an elevator in Kansas and the price at a major market is of the utmost importance to producers, since it is indicative of the proportion of the final sale value of wheat which they receive. Concerned policymakers are also interested in the behavior of price spreads as they affect wheat producers.

As discussed in Chapter V, the difference in the price at an elevator in Kansas and the price at a market like Kansas City or a Gulf port should approximate transfer costs. Usually, the most significant transfer cost is transportation. Hence, over time, price spreads should rise and fall with changes in transportation rates if the market is competitive as the Kansas wheat market is assumed to be. The additional components of a price spread are less easily identified since many of the costs are unique to a specific elevator. Therefore, changes in the additional spread components may cause a price spread to behave differently than the cost of transportation. Finally, a price spread could change by a different amount than the transportation cost changes if merchandisers of grain between the farmer and the shipment destination are able to increase or decrease "profit" margins. If margins were increased as the true cost of transporting wheat declined, a question would arise as to the competitive nature of the market. This chapter discusses analysis of geographic price spreads in the Kansas wheat market.

Definition of Price Spreads Evaluated

The price spreads to be evaluated are the differentials between cash prices at: 1) the Gulf of Mexico (rail-export) and the fourteen Kansas elevators, 2) Kansas City (rail-delivered) and the fourteen Kansas elevators, and 3) the Gulf of Mexico and Kansas City, 4) Kansas City for both rail-delivered and truck-delivered wheat (truck discount). In addition to the prices quoted by the fourteen elevators, five other price series, obtained from the "Kansas City Grain Market Review," are needed to calculate the above spreads. All of these are described below.

Weekly prices from each of the fourteen elevators located across the state provide a sample (nonstatistical) of local bids to producers. The quoted price is assumed to be for No. 1 Hard Red Winter wheat and to include no price premium for protein content. Individual adjustments (dockages) from the quoted price are customary for deficiencies in test weight and unsatisfactory moisture content; other factors may also necessitate discounting an individual load of wheat. However, these adjustments which would vary by elevator are isolated from the analysis by a standard type of bid common to all of the elevators. These price data, for the most part, have been collected on Wednesday of each week; however, for various reasons, a very small percent of the data fall on either Tuesday or Thursday. Unfortunately, some weeks' prices were not available, either at some or all of the elevators. Except for Seward during the calendar year 1977, the missing data were estimated according to other price behavior. An average of 4.4 weeks per year, or 8.5 percent, of the weekly data were estimated. Although this is undesirable, it is necessary in order to prevent the quarterly averages from being biased toward a certain part of the time period. Other price data are for the same day as is represented by the local elevator price.

In order to calculate a cash price at Kansas City and at the Gulf of Mexico, a price quote is required for a futures contract on the Kansas City Board of Trade. The contract is uniform and calls for the delivery of 5,000 bushels of No. 1 Hard Red Winter (HRW) wheat to Kansas City at authorized delivery points. Although a high, a low, and a closing price are reported for each day's trading, it is the quoted "settlement" price which is pertinent to this analysis. A "settlement" price is established for each delivery month's futures contract after the close of trading and is used to determine traders' net gains and losses, margin requirements, and the next day's price limits.[69] The specific contract month for which these data are collected is dependent upon the "basis month" as specified by the Gulf Basis quote and the Protein Premium Scale (described in the following paragraphs). Usually the "basis month" is the nearest delivery month until the current date enters that month; on that date, the "basis month" rolls over to the immediately following delivery month. For example, the "basis month" would switch on March 1 from March to May.

The Gulf cash price is determined by adding the Gulf Basis quote to the appropriate futures contract "settlement" price. The Gulf Basis quote is the best bid for Hard Red Winter wheat of ordinary protein content to arrive at the Gulf by rail. Since it is the "best bid", it follows that it represents a No. 1 grade. A bid exists for each of several to-arrive periods. Based on conversations with country elevator merchandisers, the Gulf bid included in the analysis is for the same half of the month as the current date falls in, except when the date is in the last three days of the period; in this case,

69. Commodity Trading Manual, p. 327.

the next period's bid is used.

Cash prices for wheat delivered by rail to the Kansas City market are available in much greater detail than those at the Gulf. Two separate price series are published — the Protein Premium Scale and the Kansas City Nominal Cash Range. The Protein Premium Scale is quoted as a basis to the Kansas City futures price. This scale provides the means to determine differences in the prices of wheat of different protein contents, regardless of the level of the futures price. In order to correspond with the prices at the Gulf and at the local elevator, the basis quote for wheat of ordinary protein content is applicable. For ordinary protein wheat, there is a basis range which is primarily the result of two factors: 1) Different grades (No. 1, No. 2, etc.) and 2) Billing, or freight rate balance on a carload. The top of the range is representative of No. 1 HRW wheat with the most valuable billing. In contrast, the bottom of the range represents low quality and little or no billing value.

The Kansas City Nominal Cash Range, the second price series for the Kansas City cash market for rail-delivered wheat, consists of a nominal price range for each grade of wheat. These prices are agreed upon by a group of trade people and are their estimate of the prices at which each grade of wheat would have sold if it had been available. The bottom price of a range would be for low protein wheat with little or no billing value. On the other hand, high protein wheat with valuable billing would command the top of a price range.

Prices for hard wheat delivered to Kansas City by truck are published as one range and are the prices actually posted at Kansas City terminal elevators. The highest quoted price paid for truck-delivered wheat is for No. 1 HRW, ordinary protein wheat.

<u>Kansas</u> <u>City-Local</u> <u>Price</u> <u>Spread</u> The Kansas City-Local price spread is defined as the difference between the Kansas City cash price and the price quoted to farmers at each local elevator. Maintaining consistency in this price spread requires a matching up of price series which represent similar types of wheat and that are appropriate to the market environment. Since local bids are assumed to be for No. 1 HRW wheat and to offer no protein premium, the Kansas City price must also be for No. 1 HRW wheat of ordinary protein content. In this regard, both the Protein Premium Scale and the Kansas City Nominal Cash Range will provide the necessary price. However, the transportation environment dictates which of the price series is compatible and also which end of the applicable price range is appropriate to use.

Prior to the inception of the volume rates out of Kansas City in early January 1981 and of the mileage-based gathering rates from country elevators to Kansas City during the first half of 1981, the transportation of grain was operated under the transit system of rail rates. Because of this, a carload of wheat in Kansas City arriving by rail from an elevator in the country commanded a relatively higher price than wheat without rail billing (same quality of wheat). However, the volume rates and the new gathering rates eliminated the need for transit billing on wheat delivered to Kansas City for it to move on to the Gulf. Transit billing continued to be used for supporting proportional rates and transit balances on movements to the East. Due to the change in the transportation rate system, it is necessary to select a Kansas City cash price which represented the market for wheat shipped from the local elevator to Kansas City. The Protein Premium Scale fits the requirements of the period before the rate system changed. Hence, the top of the ordinary protein premium basis range is added to the Kansas City futures "settlement" price to establish the cash price for the first period. For the balance of the study period, the bottom of the Kansas City Nominal Cash Range becomes the measure of the Kansas City cash price. By switching between the two cash price series, both the grade (No. 1) and the protein content (ordinary) have been maintained constant, while recognizing a difference in the application of billing in the Kansas City market.

Gulf-Local Price Spread Defining the Gulf-Local price spread is much simpler than for the Kansas City-Local price spread. It is necessary to compare prices for similar quality wheat at both markets. The Gulf cash price, as calculated from the Gulf Basis quote, does match up to the local elevator bid. Hence, the Gulf-Local price spread is defined as the difference between the Gulf cash price and each of the local elevator bids, i.e. No. 1, ordinary protein.

Gulf-Kansas City Price Spread This price differential measures the difference in prices at two major markets. The Kansas City cash price is not only affected by the Gulf price, but also by prices bid by millers and processors. Analysis by Maydew indicated this spread was limited in size by the average balance of the through rate to the Gulf when transit still existed through December 1980.[70] In effect, the Gulf price establishes a minimum which millers or other buyers can bid successfully for wheat at Kansas City. But there are times when millers and other buyers will outbid Gulf exporters; consequently, the spread exhibits variability. Maydew reported that the higher bids by millers, and by others, is "especially evident in the months just

70. Maydew, p. 65.

prior to harvest."[71] Maydew explains this phenomenon on the basis that flour millers have a more consistent demand for wheat than do exporters. The purpose of analyzing this spread is to have a further look at the behavior of the spread since Maydew's analysis ended in June 1981. Maydew defined his price spread (Gulf-Rail) as the "(highest) Gulf basis quoted minus the highest basis for ordinary protein wheat delivered to Kansas City by rail . . ." The Gulf-Kansas City spread is defined here as the difference between the Gulf cash price (as defined in "Gulf-Local Price Spread") and the Kansas City cash price (as defined in "Kansas City-Local Price Spread"). The change in the definition of the Kansas City cash price explained earlier results in a change in the definition of the Gulf-Kansas City spread after December 1980. However, this is justified for those reasons given in the "Kansas City-Local Price Spread" section.

<u>Truck Discount</u> The truck discount is a measure of the relative price disadvantage of truck-delivered wheat compared to rail-delivered wheat. Under the transit system prior to deregulation, wheat arriving by rail had a lower cost of rail transportation to the Gulf from Kansas City than any wheat arriving by truck. Therefore, buyers in Kansas City would pay more for wheat arriving by rail. But after 1980 and the subsequent introduction of volume rates out of Kansas City, there was no longer the need for rail billing to move wheat to the Gulf competitively. As a consequence, the reason for the truck discount was partially eliminated; however, transit still applied on some movements and therefore, some truck-delivered grain had to be discounted. If the savings in transportation costs for truck-delivered wheat were being passed on to the shippers, the truck discount would be expected to have declined.

71. Ibid., p. 68.

Calculation of the truck discount requires a truck bid and a rail bid which were for wheat of as equivalent quality as possible. Additionally, the rail bid must be for wheat having the least amount of transit billing. Therefore, the two price series selected for the analysis are the highest truck bid and the lowest price of the No. 1 grade Kansas City Nominal Cash Range. The quality of the wheat represented by both of these prices is No. 1 grade and the rail bid has the least amount of billing for No. 1 wheat. However, the bids may represent slightly different levels of protein content. This seems to be the maximum amount of consistency attainable between a rail bid and a truck bid for investigating the truck discount.

Analysis of Price Spreads

The following sections provide, as set out in objectives 2 and 3, a description of the behavior of the price spreads over the total study period. Besides documenting each price spread on a quarterly basis, statistical tests are performed for the purpose of identifying characteristics of the price spreads over time and across locations, when applicable.

Gulf-Local Price Spread The price spreads between the Gulf ports and each of the fourteen local elevators are listed in Appendix B, Table 1, along with quarterly changes in absolute terms and as a percentage. It is difficult to ascertain much of anything from these data in table form other than that the price spreads generally increased through the first quarter of 1981 and then declined into the second quarter of 1983. However, if the price spreads are compared directly to the effective transportation rate to the Gulf (Appendix A, Table 1), then the relationship becomes clearer. This direct comparison is exhibited in Figures 1 through 14 in Appendix B. These graphs show that the price spreads followed the same overall pattern as the rail rates. However, the spreads were much more variahle than the rail rates. The additional variability in the Gulf-local spread can he caused hy price movements in other markets (i.e. Kansas City) and hy the additional components of transfer cost including the merchandisers' "profit" margin. Since transportation rates were fairly stahle in the short-run (see Chapter VI), it is more useful to examine the behavior of the residual remaining after removing transportation costs from the price spread; this residual shall he termed a "total margin." The total margin is affected by all factors not accounted for in the transportation rate.

Table 2 in Appendix B lists data on the total margin of the Gulf-Local price spread. The data are the means and the standard deviations of the weekly ohservations for each quarter. The standard deviation provides a measure of the total margin's variahility within each quarter. Although many of the factors affecting the total margin can he unique to the specific elevator, it is expected that the total margins of elevators in the same section of the state would move in similar fashion because of local supply-demand conditions and the alternative markets that the elevators have in common. The total margins are plotted over time for each location included in the study in Appendix B, Figures 15 through 18. They are grouped by the regions utilized throughout this paper -- Northwest, Northeast, Central, and Southwest. There does appear to he similar patterns within each region and slight differences between regions. The primary reason for differences between regions prohahly lies in the fact that the regions have different total sets of marketing alternatives. For example, the elevators in the Northeast are much more likely to ship wheat to Kansas City than are the elevators in the Southwest.

Examination of these graphs suggests a difference in margin between some locations and possibly over time. It is important to investigate to see if the total margin changed significantly after deregulation of the railroads and the ensuing transportation rate decreases. For this analysis, the pre-deregulation time period was specified as being from the first quarter of 1978 through the fourth quarter of 1980, or a total of three years. The 1977 data had to be omitted in order to keep Seward in the analysis. Since the main rail rate changes occurred in the first half of 1981, those two quarters were also left out of the analysis. Subsequently, the post-deregulation period was specified as the third quarter of 1981 through the second quarter of 1983; this is a two year period. Analysis of variance statistical techniques were applied to the quarterly means and standard deviations of the Gulf-Local total margin.

The results of the analysis of variance are presented in Appendix B, Table 3. The ANOVA table for the mean of the Gulf-Local total margin shows that there was no change in the total margin after the first half of 1981 (TIME, α=.05) if all locations are aggregated. The test for all locations (LOC, α=.05) having equal total margins was significant, indicating there were differences in total margins between locations over the entire five year period. But the most important result of the hypothesis tests is that interaction (LOC*TIME, α=.05) between locations and the two time periods was significant. Hence, differences in the total margin between locations can only be examined within each time period. Similarly, each location must be looked at individually to test if there was a significant change in that location's total margin after deregulation. These various effects are examined using the "Least Significant Difference (LSD)" method with α=.05. The degrees of freedom for the tests are 234 and therefore the t-statistic is 1.97.

Table 9 lists each location and the change in its mean total margin from before deregulation to after deregulation according to whether the change was significant. Only four locations exhibited significant changes in their Gulf-Local mean total margin. Marshall, Mitchell, and Pratt had increases in the margin, while Saline had a decrease in the margin; additionally, it had the largest change of any location under study. The differences between the two periods' mean total margin for all the other locations were not significantly different than zero.

TABLE 9. LSD Test of Pre-First Half-1981 vs. Post-First Half-1981 for the Gulf-Local Mean Total Margin

	Change in Gulf-Local Mean Total Margin	
Location	Significant*	Nonsignificant
	c/bu.	c/bu.
Marshall	5.45	
Pratt	3.95	
Mitchell	3.43	
Scott		2.34
Ford		1.88
Sheridan		1.40
Shawnee		1.37
Cloud		0.82
Finney		0.57
Seward		-0.66
Cheyenne		-1.81
Russell		-2.27
Thomas		-2.46
Saline	-6.22	

*LSD = $(13.03 * (1/12 + 1/8))^{1/2} * 1.97 = 3.24$ c/bu.

Since some locations exhibited increases in their mean total margin and others had decreases in their mean total margin, comparisons between locations are made for the time periods both before and after the first half of 1981. Table 10 presents the results of the LSD analysis for the 1978-1980 period. Marshall and Shawnee of the Northeast region had mean total margins significantly smaller than all other locations. Seward had a larger mean total margin than all other locations except Finney. Four of the six locations which had the largest mean total margins are from the Southwest region; Pratt's margin was significantly less than all other Southwest locations' margin. From the Northwest region, Thomas had a margin significantly larger than either Sheridan or Cheyenne did. All of the locations in the Central region had margins which were not statistically different from each other.

Table 11 presents the results of the LSD analysis on the total margin for the 1981-1983 period. The total margin at Shawnee remained significantly smaller than the total margin of all other locations under study. Since Pratt's total margin increased significantly after deregulation (Table 9), all locations in the Southwest region had post-deregulation total margins which were not significantly different. Also the total margins of the Northwest locations were not significantly different than each other. In the Central region, Mitchell had a total margin significantly larger than the other three locations. The two locations near terminal elevators, Saline and Shawnee, had total margins significantly smaller than all but three other locations -- Cheyenne, Russell, and Marshall.

The previous discussion has highlighted some geographic characteristics of the total margin of the Gulf-Local price spread. There was only a small amount of change in the level of the total margin when post-deregulation is

TABLE 10. LSD Test of Differences Between Locations in the 1978-1980 Period for the Gulf-Local Mean Total Margin

			Location	Mean Total Margin c/bu.
		A	Seward	22.09
	B	A	Finney	19.58
	B	C	Thomas	18.32
D	B	C	Ford	18.11
D	B	C	Scott	17.66
D	E	C	Saline	15.95
D	E		Mitchell	15.32
	E	F	Cheyenne	15.05
	E	F	Russell	14.72
	E	F	Cloud	14.36
	E	F	Pratt	14.26
		F	Sheridan	12.14
			Marshall	6.89
			Shawnee	3.36

*LSD = $(13.03 * (1/12 + 1/12))^{1/2} * 1.97 = 2.90$ c/bu.
Means with the same letter are not significantly different.

compared to pre-deregulation. The next characteristic of the total margin that is examined is the amount of variability present in each quarter, as estimated by the standard deviation of the weekly observations aggregated into quarterly averages. The statistical techniques used for this analysis are the same as those applied earlier to the quarterly means of the Gulf-Local total margin.

The ANOVA table for the variability of the Gulf-Local total margin is in Appendix B, Table 4. The same general conclusions can be made about the total margin's variability as was made about its mean: 1) the variability did not change after deregulation if all locations are aggregated, 2) for the entire

TABLE 11. LSD Test of Differences Between Locations in the 1981-1983 Period for the Gulf-Local Mean Total Margin

			Location	Mean Total Margin
				c/bu.
		A	Seward	21.43
		A	Finney	20.15
		A	Ford	20.00
		A	Scott	20.00
	B	A	Mitchell	18.75
C	B	A	Pratt	18.21
C	B	D	Thomas	15.86
C		D	Cloud	15.18
		D	Sheridan	13.54
	E	D	Cheyenne	13.24
	E	D	Russell	12.45
	E	D	Marshall	12.34
	E		Saline	9.73
	E		Shawnee	4.73

*LSD = $(13.03 * (1/8 + 1/8))^{1/2} * 1.97 = 3.56$ c/bu.
Means with the same letter are not significantly different.

5-year time period, there were differences between locations, and 3) there was interaction between locations and the two time periods examined. Therefore, differences in the variability of the total margin will be tested for in the same fashion as was done for the mean total margin.

Table 12 lists each location and its respective change in variability from the three years prior to January 1981 to the two years after June 1981. Half of the fourteen locations had significant changes in variability and all of these seven were increases. Four of the five locations in the Southwest region had nonsignificant changes in the variability of their Gulf-Local total margin. Marshall and Shawnee of the Northeast region incurred significant

TABLE 12. LSD Test of Pre-First Half-1981 vs. Post-First Half-1981 for the Gulf-Local Total Margin Variability

	Change in Gulf-Local Total Margin Variability	
Location	Significant*	Nonsignificant
	c/bu.	c/bu.
Russell	2.13	
Thomas	1.68	
Marshall	1.66	
Cheyenne	1.61	
Shawnee	1.36	
Pratt	1.29	
Cloud	1.13	
Mitchell		0.75
Sheridan		0.55
Saline		0.54
Ford		0.26
Scott		0.08
Seward		-0.42
Finney		-0.43

*LSD = $(1.40 * (1/12 + 1/8))^{1/2} * 1.97 = 1.07$ c/bu.

increases in variability.

Table 13 presents the LSD analysis on the total margin variability for the 1978-1980 period. There does not appear to be much difference between locations in the variability of their Gulf-Local total margin. However, there is some indication that the Southwest locations had a lower amount of variability in their total margin than the other nine locations, although not all of them were significantly different. For the most part, the total margin variability of each location within a given region did not significantly differ from each other; Pratt in the Southwest region is the only exception.

TABLE 13. LSD Test of Differences Between Locations in the 1978-1980 Period for the Gulf-Local Total Margin Variability

				Location	Total Margin Variability
					c/bu.
			A	Cheyenne	5.05
		B	A	Shawnee	4.90
	C	B	A	Saline	4.85
	C	B	A	Sheridan	4.65
D	C	B	A	Marshall	4.35
D	C	B	A	Thomas	4.32
D	C	B	A	Mitchell	4.29
D	C	B	A	Cloud	4.11
D	C	B	E	Seward	3.97
D	C	B	E	Russell	3.96
D	C		E	Finney	3.93
D		F	E	Scott	3.57
		F	E	Ford	3.03
		F		Pratt	2.94

*LSD = $(1.40 * (1/12 + 1/12))^{1/2} * 1.97 = 0.95$ c/bu.
Means with the same letter are not significantly different.

Table 14 contains the results of the LSD analysis on the total margin variability in the 1981-1983 period. Except for Cheyenne in the Northwest region, locations within each region did not have significant differences in the variability of their Gulf-Local total margin. Four of the five Southwest locations had variability measures significantly less than all other locations. The total margin variabilities of Cheyenne, Shawnee, Russell, Marshall, and Thomas were significantly larger than the variability at all locations in the Southwest region.

This analysis on the quarterly mean and standard deviation of the Gulf-Local total margin suggests that the locations in the Southwest region had

TABLE 14. LSD Test of Differences Between Locations in the 1981-1983 Period for the Gulf-Local Total Margin Variability

			Location	Total Margin Variability
				c/bu.
		A	Cheyenne	6.66
	B	A	Shawnee	6.26
C	B	A	Russell	6.09
C	B	A	Marshall	6.01
C	B	A	Thomas	6.00
C	B	D	Saline	5.39
C	B	D	Cloud	5.24
C	B	D	Sheridan	5.20
C		D	Mitchell	5.04
	E	D	Pratt	4.23
	E		Scott	3.65
	E		Seward	3.55
	E		Finney	3.50
	E		Ford	3.29

*LSD = $(1.40 * (1/12 + 1/12))^{½} * 1.97 = 1.17$ c/bu.
Means with the same letter are not significantly different.

total margins which were larger and less variable than the total margins of virtually all other locations included in the study. Also it was found that all locations in the Southwest region, except for Pratt, incurred no change in the mean level or the variability of their Gulf-Local total margins. When interpreting these results, it is important to keep in mind that the Gulf-Local total margin is the total margin which would have been available to each elevator if it sold only to the Gulf ports for export. But this is not the case because each elevator across the state has its own set of marketing alternatives. But the observation made that the Southwest locations had larger and less variable total margins is consistent with expected marketing patterns. It is consistent because the Southwest locations find the Gulf export market to be a good market alternative such that "profit" margins will be larger if wheat is shipped that direction. Therefore, if those locations ship large amounts of wheat to the Gulf, then the Local price should more nearly follow the Gulf price and as a consequence, the Gulf-Local price spread and total margin will be less variable in the short-run than if other markets had more influence. The observation that Marshall and Shawnee had relatively small total margins, especially prior to deregulation, probably indicates that Kansas City was a more viable market than the direct Gulf export market; the total margin of the Kansas City-Local price spread is examined in the next analysis section and this will give more insight into the total margin of the locations outside the Southwest.

The LSD test for changes between time periods (Table 9) indicates that the total margin at Saline decreased significantly by 6.22 cents per bushel after deregulation. Since Saline is in close proximity to terminal elevators, it seems that the Gulf export market would be attractive. This is substantiated by the fact that in 1981, 73.0 percent of wheat shipments from the Central crop reporting district were to Gulf ports ("Kansas Wheat Marketing Patterns" - Figure 4). Hence, it is somewhat surprising that the Gulf-Local total margin decreased over 6 cents per bushel from about 16 cents per bushel to around 9.7 cents per bushel. This observation could be the result of using a transportation rate in the post-deregulation period which was higher than which grain could actually move on to the Gulf. This is possible since the contract rate from Salina was estimated. If the Saline total margin did not change significantly, then the actual contract rate from Salina may have been about 6 cents per bushel, or 10 cents per hundredweight, lower than the estimate used in the analysis. Another reason for the decline in total margin may be that the competition at Salina has driven "profit" margins down. The increased competition could be due to contract rates among market participants or to the reduction in wheat exports. If the real contract rate from Salina was lower than that used in the analysis, there would be an effect on the total margins of those locations which had a truck-rail combination rate applied to them from early 1981 to early 1982.

The analysis so far has examined the Gulf-Local total margin based on the pre- and post-deregulation time periods. It has been hypothesized that margins exhibit seasonality partly as a result of supply-demand conditions. For example, margins may widen at harvest because many farmers want to sell grain and the demand is not sufficient to maintain a highly competitive environment. Local elevators may need wider margins because of a lack of storage space or transportation problems. To test if seasonality was present in the Gulf-Local total margin at the fourteen locations under study, analysis of variance was used on the quarterly mean and the quarterly standard deviation; the SAS General Linear Models (GLM) procedure was utilized.

Since it's possible that the total margin is a function of the crop year, the time period for which data were selected is slightly different than the time periods used in the previous tests. In order to keep Seward in the analysis, it was necessary to drop the first six quarters of data; therefore, this analysis' time period begins with the 1978 crop year (3rd Qtr.-1978) and runs continuously through the 1982 crop year (2nd Qtr.-1983). Hence, five years of data are included in the test for seasonality in the total margin.

The results of the GLM procedure for testing the seasonality effect on the mean and the variability of the Gulf-Local total margin are listed in

Appendix B, Table 5. The model tests for differences between locations, differences between crop year quarters, and for interaction between location and crop year quarter. The model testing the total margin mean and the model testing the total margin variability are both highly significant at the α=.05 level. Similarly, both models find that there were location effects and crop year quarter effects, but no interaction between the two. The location effects are consistent with the results of the analysis discussed earlier in this section. The crop year quarter effect indicates there were significant differences between at least two crop year quarters in their total margin mean and also in their total margin variability. Since the interaction was not significant, the seasonality of the margin is tested with all locations aggregated. To determine which crop year quarters differ with regard to these characteristics, the SAS LSMEANS procedure was used. These results are listed in Appendix B.

Using α=.05, the conclusion can be made that the total margin means in the first three quarters of the crop year were not significantly different from each other, but that all three of them did significantly differ from the total margin mean of the fourth quarter of the crop year. If the total margin mean of the first three crop year quarters are averaged together, the total margin mean of the fourth quarter was about four cents per bushel less than the other three quarters' average total margin.

Based on the results of the LSMEANS procedure, the variability of the total margin was not significantly different between the first and second quarters of the crop year. However, the variability of the total margin in the third quarter did significantly differ from all other quarters' variability; it was greater than the first two quarters and smaller than the fourth quarter. Hence, the fourth quarter's total margin variability was significantly greater than the variability in each of the first three crop year quarters.

Table 15 summarizes the results of analysis on seasonality of the total margin. The fourth quarter of the crop year had the smallest total margin and the greatest amount of variability in the total margin. A smaller, more variable Gulf-Local total margin in the fourth quarter could be because supplies were tighter and domestic markets, i.e. millers, were at times bidding relatively higher for wheat than Gulf exporters.

TABLE 15. Comparison of Significant Differences Between Crop Year Quarters in the Mean and the Variability of the Gulf-Local Total Margin

Crop Year Quarter	Total Margin Mean	Crop Year Quarter	Total Margin Variability
	c/bu.		c/bu.
1	16.32 A	4	5.82
3	15.95 A	3	4.81
2	14.38 A	2	3.95 A
4	11.59	1	3.67 A

Means with the same letter are not significantly different, alpha = .05.

The complete analysis on the Gulf-Local total margins suggests there were no widespread changes in the quarterly mean of the margin after deregulation and that the margin may have become slightly more variable since half of the locations incurred significant increases in the quarterly standard deviation of their total margins. The total margin in the fourth quarter of the crop year appears to have been the smallest and most variable.

Kansas City-Local Price Spread The Kansas City-Local price spread is examined in the same way, using the same methodology, as was the Gulf-Local price spread. However, the findings of the previous analysis should aid in interpreting the results discussed throughout this section.

The actual values of the quarterly price spread between Kansas City and each of local elevators are listed in Appendix B, Table 6. But again, the relationship between the rail rates to Kansas City and the Kansas City-Local price spread can best be comprehended by examining graphs displaying both rail rates and price spreads. Examination of Figures 19 through 32 in Appendix B shows that at most locations the price spread followed the general pattern of the rail rates. However, the spread exhibited much more variability than the rail rate did. Hence, the total margin of the Kansas City-Local price spread is analyzed instead of the price spread itself. The components of the Kansas City-Local (KC-Local) total margin would be theoretically similar to the components of the Gulf-Local total margin; that is, there should be additional transfer costs, a "profit" margin, and other market influences affecting the KC-Local total margin. The quarterly mean and standard deviation of the KC-Local total margin for each location are listed in Appendix B, Table 7. Figures 33 through 36 in Appendix B show that the total margin behaved similarly at most of the locations within each region, although there were differences between regions. Substantial dissimilarities within a region existed for Shawnee in the Northeast, Saline in the Central, and Seward in the Southwest.

Statistical analysis of these total margin data is necessary to find significant differences between any of the fourteen locations, differences over time, or seasonality of the KC-Local total margin.

First, the KC-Local total margin is examined for changes from before deregulation to after deregulation. The respective time periods are the same as in the analysis of the Gulf-Local total margin -- 1978-1980 and last half-1981 through first half-1983. The results of the analysis of variance are presented in Appendix B, Table 8. The test of a change in the mean of the total margin after the first half of 1981 is significant (TIME, α=.05). The mean total margin of the 1978-1980 time period was 15.8 cents per bushel and was 8.5 cents per bushel larger than the mean total margin of 7.3 cents per bushel for the 1981-1983 time period. The model also found significant differences between at least two locations' total margins (LOC, α=.05). But since interaction between locations and the two time periods was significant, only differences between the locations' total margin within each time period can be examined. Even though the aggregate of all locations' total margin differed significantly after deregulation from before deregulation, the interaction necessitates that each location be looked at individually to see the amount of change in each location's margin mean. These various effects are compared with the LSD method and α=.05.

Table 16 lists the amount of change which occurred in each location's KC-Local mean total margin after deregulation. Of the fourteen locations, only Marshall and Pratt had changes non-significantly different than zero. And Seward was the only location which experienced an increase in the mean total margin. The locations from the Southwest region had five of the six smallest declines in the KC-Local total margin (Seward actually increased). Saline had a margin decrease considerably larger than did any other location.

TABLE 16. LSD Test of Pre-First Half-1981 vs. Post-First Half-1981 for the Kansas City-Local Mean Total Margin

	Change in Kansas City-Local Mean Total Margin	
Location	Significant*	Nonsignificant
	c/bu.	c/bu.
Seward	8.53	
Marshall		-2.72
Pratt		-2.86
Finney	-4.00	
Scott	-4.77	
Ford	-6.29	
Mitchell	-7.36	
Russell	-8.28	
Cloud	-11.17	
Sheridan	-12.90	
Thomas	-12.91	
Shawnee	-14.36	
Cheyenne	-16.17	
Saline	-24.19	

*LSD = $(13.58 * (1/12 + 1/8))^{\frac{1}{2}} * 1.97 = 3.31$ c/bu.

Since there is such a wide range in the amount of significant change which occurred after the first half of 1981 at the study locations, examining each location's relative mean margin for each time period is necessary. Table 17 contains the LSD analysis of the mean total margin during 1978-1980. Seward had a negative KC-Local mean total margin that is significantly smaller than any other location. The five Southwest locations had five of the seven smallest mean margins. On the other hand, the Northwest locations had three of the four largest mean margins. These data suggest that most locations outside the Southwest area had larger KC-Local mean total margins than in the Southwest for the pre-deregulation time period.

TABLE 17. LSD Test of Differences Between Locations in the 1978-1980 Period for the Kansas City-Local Mean Total Margin

			Location	Mean Total Margin
				c/bu.
		A	Cheyenne	23.03
	B	A	Thomas	22.25
	B	A	Marshall	21.66
	B	A	Sheridan	21.58
	B	A	Mitchell	20.07
	B		Cloud	20.01
		C	Shawnee	16.50
	D	C	Ford	15.57
	D	C	Saline	15.45
E	D	C	Russell	14.79
E	D	F	Scott	13.38
E		F	Pratt	12.29
		F	Finney	11.68
			Seward	-6.88

*LSD = $(13.58 * (1/12 + 1/12))^{1/2} * 1.97 = 2.96$ c/bu.
Means with the same letter are not significantly different.

As was discussed earlier, the Southwest locations exhibited some of the smallest declines in the KC-Local mean total margin. This may have been because they already had smaller margins than other locations, as was discovered in the LSD analysis (Table 17). Hence, it would be expected that the fourteen locations developed mean total margins after June 1981 which were more equal throughout than during the 1978-1980 period. The LSD analysis presented in Table 18 supports this reasoning. As can be seen, the locations do not cluster by regions; in fact, they appear to be fairly well dispersed. But there is a wide range from the largest margin to the smallest margin and there are several locations which do not differ significantly from each other. Marshall had a mean total margin significantly larger than all other locations. In contrast, Saline had the smallest mean total margin that was over 10 cents per bushel less than the next smallest margin (Seward). Shawnee and Seward, located in opposite corners of the state, had KC-Local mean total margins which did not significantly differ. In the Central region, Mitchell had a margin significantly larger than Russell, Cloud, and Saline. Most notable, though, is that four Southwest locations, three Northwest locations, and two Central locations did not differ from each other based on the LSD test; the average mean margin of the nine locations was 8.35 cents per bushel. Saline and Shawnee, two locations near terminal elevators, had two of the three smallest KC-Local mean total margins in the 1981-1983 period. This characteristic is similar to that observed for the same two locations in the LSD test on the Gulf-Local mean total margin (Table 11).

The complete analysis discussed so far in this section shows that there were significant changes, some substantial, in the KC-Local mean total margin over the study period and that every location except Seward experienced a decline. It also appears that the geographic tendencies in the total margin present before deregulation virtually disappeared afterwards. This behavior may be the result of the major restructuring of the gathering rates to Kansas City which began in April 1981. The negative margin at Saline is expected since Salina has the contract rate to the Gulf of Mexico.

The variability of the KC-Local total margin will now be examined. The quarterly standard deviations of the margin are listed in Appendix B, Table 7. Also presented in Appendix B, Table 9, is the ANOVA table for the test of effects on the KC-Local total margin's variability. The same conclusions can be made about the variabilities of both the KC-Local total margin and the Gulf-Local total margin. Those conclusions are: 1) there was no change in

TABLE 18. LSD Test of Differences Between Locations in the 1981-1983 Period for the Kansas City-Local Mean Total Margin

		Location	Mean Total Margin
			c/bu.
		Marshall	18.94
	A	Mitchell	12.71
B	A	Pratt	9.43
B	A	Thomas	9.34
B	A	Ford	9.28
B		Cloud	8.84
B		Sheridan	8.68
B		Scott	8.61
B		Finney	7.68
B		Cheyenne	6.86
B		Russell	6.46
	C	Shawnee	2.14
	C	Seward	1.65
		Saline	-8.74

*LSD = $(13.58 * (1/8 + 1/8))^{1/2} * 1.97 = 3.63$ c/bu.
Means with the same letter are not significantly different.

variability over the study period when all locations are considered together, and 2) interaction existed between locations and the two time periods.

Differences between post-deregulation and pre-deregulation in the variability of the KC-Local total margin for each location are recorded in Table 19. All locations had positive changes, although only half of them were of significant magnitude. The locations with significant increases in variability of their margin include all of those from the Southwest and also Shawnee and Russell.

Table 20 illustrates the LSD analysis on pre-deregulation variability of the KC-Local total margin. There was very little significant difference

TABLE 19. LSD Test of Pre-First Half-1981 vs. Post-First Half-1981 for the Kansas City-Local Total Margin Variability

Location	Change in Kansas City-Local Total Margin Variability	
	Significant*	Nonsignificant
	c/bu.	c/bu.
Pratt	2.62	
Ford	2.37	
Finney	1.72	
Scott	1.66	
Seward	1.44	
Russell	1.33	
Shawnee	1.11	
Sheridan		0.91
Mitchell		0.84
Cheyenne		0.83
Cloud		0.72
Saline		0.36
Marshall		0.07
Thomas		0.05

*LSD = $(1.15 * (1/12 + 1/8))^{\frac{1}{2}} * 1.97 = 0.96$ c/bu.

between any of the locations. The Southwest locations are in the group having the most variability, but this group consists of nine locations. Within the Central region, Cloud's margin was significantly less variable than the other three locations' margins. Thomas had a more variable margin than did Sheridan of the Northwest region. The other two regions had no differentiation among their respective locations' variability.

Although there were no large differentials in the margin variability among the locations in the 1978-1980 period, the fact that seven locations had significant increases in the variability of their KC-Local total margin (Table 19) would suggest that these seven locations exhibited variability in their

TABLE 20. LSD Test of Differences Between Locations in the 1978-1980 Period for the Kansas City-Local Total Margin Variability

			Location	Total Margin Variability
				c/bu.
		A	Finney	4.73
		A	Seward	4.60
	B	A	Scott	4.32
	B	A	Thomas	4.26
	B	A	Russell	4.25
	B	A	Saline	4.24
C	B	A	Shawnee	4.19
C	B	A	Pratt	3.98
C	B	A	Ford	3.93
C	B	A	Mitchell	3.89
C	B		Marshall	3.69
C	B		Cheyenne	3.68
C			Cloud	3.37
C			Sheridan	3.32

*LSD = $(1.15 * (1/12 + 1/12))^{\frac{1}{2}} * 1.97 = 0.86$ c/bu.
Means with the same letter are not significantly different.

total margin after the first half of 1981 that may have been significantly more than most other locations' KC-Local total margin variability. Table 21 has the LSD analysis which suggests this result. The five Southwest locations had margin variabilities significantly larger than all other locations except Russell and Shawnee, the other two locations which experienced significant increases in their total margin variability after deregulation. However, Russell and Shawnee were not significantly different than all non-Southwest locations. Russell did have a significantly larger amount of variability than the other three Central locations. The variability at the locations in the Northwest were essentially equal. The measured variability of Shawnee's total margin was 1.78 cents per bushel higher than that of Marshall's total margin;

TABLE 21. LSD Test of Differences Between Locations in the 1981-1983 Period for the Kansas City-Local Total Margin Variability

			Location	Total Margin Variability
				c/bu.
		A	Pratt	6.60
		A	Finney	6.45
	B	A	Ford	6.30
	B	A	Seward	6.04
	B	A	Scott	5.98
C	B	A	Russell	5.58
C	B	D	Shawnee	5.30
C	E	D	Mitchell	4.73
C	E	D	Saline	4.60
	E	D	Cheyenne	4.51
	E	D	Thomas	4.31
	E		Sheridan	4.23
	E		Cloud	4.09
	E		Marshall	3.76

*LSD = $(1.15 * (1/8 + 1/8))^{1/2} * 1.97 = 1.06$ c/bu.
Means with the same letter are not significantly different.

this is a significant differential based on the LSD test.

The results discussed above on the mean and variability of the KC-Local total margin are consistent with expected geographic characteristics. According to the 1981 study on grain marketing, only 1.75 percent of wheat shipments moved to Kansas City from the combined Kansas crop reporting districts of Southwest and Southcentral.[72] Thus, it would be expected that there wasn't an incentive in the total margin to encourage shipments toward Kansas City. The LSD analysis on the mean margin confirms this observation; the Southwest locations had five of the seven smallest margins during the 1978-1980 period. The

72. "Kansas Grain Marketing and Transportation - Data for 1981 Crop," p. 18.

Northwest region, on the other hand, had three of the four largest mean margins and in conjunction, the Northwest crop reporting district had in 1981 only 24.9 percent of shipments go directly to Gulf ports ("Kansas Wheat Marketing Patterns" - Figure 4.); almost 70 percent of shipments went either to Kansas City, Salina, or Nebraska. Concerning total margin variability, there wasn't much difference among the fourteen locations before deregulation. However, the Southwest locations had significant increases in the variability of their KC-Local total margins and consequently had more variability after June 1981 than all but two of the other study locations. This characteristic appears to be appropriate since the Southwest locations probably based their price more on markets outside the Kansas City cash market. It is difficult to explain why the Southwest locations did not also have significantly higher variability than the other locations in the 1978-1980 period.

The results of the two analyses on the Gulf-Local total margin and the KC-Local total margin with respect to the mean and variability of the margins has been for the most part congruous. Therefore, one further comparison is necessary and that is on the seasonality traits of the KC-Local total margin. Using the SAS GLM procedure, analysis of variance was used to test for any difference between crop year quarters for both the mean and the variability of the total margin. Again, the time period of this investigation is the 1978 crop year through the 1982 crop year.

The results of the analyses are presented in Appendix B, Table 10. Both models are significant at α=.05. Also both models indicate that there were differences between at least two locations in the mean and/or variability of their total margin. These differences have already been examined in the LSD tests discussed earlier. The important effect that is of interest is that of the crop year quarter which infers something about seasonality of the variable being tested. The model which tests the KC-Local mean total margin indicates that there was no significant difference between any of the crop year quarters. This test result would be influenced by the previous finding that the KC-Local mean total margin decreased 8.5 cents per bushel after deregulation. Since the total margin decreased, it causes too much variability between crop years to be able to measure significant differences between crop year quarters.

However, the variability of the KC-Local total margin did not change significantly over time. Therefore, the test for effects of the crop year quarter should be valid. The model does find there to be a significant difference in the variability of at least one crop year quarter from the other quarters. Hence, the LSMEANS procedure was utilized to determine which quarters differ from which; these results are in Appendix B, Table 10. At α=.05, the fourth quarter's variability was significantly larger than the other three quarters' variability. The second quarter had significantly more variability than did quarter one. Quarters three and one and quarters two and three did not differ significantly. Table 22 illustrates these findings. So for both the Gulf-Local total margin and the KC-Local total margin, the most variability occurred in the fourth quarter of the crop year and the least amount occurred in the first quarter. It also appears that the larger margins occurred in the first quarter and the smaller margins were in the fourth quarter. There is an explanation for this behavior. In the first quarter of the crop year, supply (country movement) is great enough that merchandisers, or elevator managers, can widen their "profit" margins due to less competition for the available supply. Transportation and storage problems could also justify the larger first quarter margins. The first quarter's total margin may be less variable than the fourth quarter's total margin because there is more competition for the available supply in the fourth quarter by exporters, processors, millers, and possibly feedlots. The variability rises because the market an elevator's best net bid is received from may change from week to week, if not day to day.

TABLE 22. Significant Differences Between Crop Year Quarters in the Variability of the Kansas City-Local Total Margin

Crop Year Quarter	Total Margin Variability
	c/bu.
4	5.73
2	4.81 A
3	4.36 A B
1	3.53 B

Means with the same letter are not significantly different, alpha = .05.

The overall analysis on the KC-Local total margin suggests that those study locations which were more likely to ship wheat to Kansas City (non-Southwest locations) incurred significant decreases in their margins after deregulation. Over the same period, the variability of the KC-Local total margin at these same locations increased. It should be noted that the increased variability may be related to the movement of the margin to a lower level. The standard deviation of thirteen observations would rise if the observations had a wide range resulting from a large decrease from the start of a quarter to the end of a quarter.

Comparison of the Gulf-Local and the Kansas City-Local Total Margins As was discussed in Chapter V, "Local Elevator Price Determination," prices at any given elevator usually are not based on just one market. Each day the market is probed for the best net price which an elevator could receive. And supposedly this has the most influence on the price quoted to producers. Therefore, a direct comparison of the Gulf-Local total margin and the Kansas City-Local total margin for each of the fourteen study locations should provide a better picture of the actual margin at which each elevator was operating from January 1977 to June 1983.

The quarterly total margins of the Gulf-Local price spread and the KC-Local price spread are graphed together in Figures 1 through 14 in Appendix C. The relationship between the two margins at Seward is unique when compared to the other locations′ relationships. The KC-Local total margin was substantially less than the Gulf-Local total margin. Most of the time it was negative. It appears that Seward was locked out of the Kansas City cash market. In general, all Southwest locations had a Gulf-Local total margin that remained above the KC-Local total margin. Seward had the most obvious example of this behavior.

Most of the locations in the Northwest region and the Central region were characterized by KC-Local total margins which were greater than the Gulf-Local total margin before deregulation, but which were less than the Gulf-Local total margin after deregulation. However, the Saline location had very similar total margins to both markets before deregulation, after which the KC-Local total margin was both negative and considerably less than the Gulf-Local total margin. Although Marshall and Shawnee of the Northeast region both had KC-Local total margins visibly greater than the Gulf-Local total margin before deregulation, there was some contrast between the two locations afterwards. After deregulation, Marshall's larger margin was to the Kansas City market and Shawnee's larger margin was to the Gulf export market.

Another characteristic of the total margins over the study period is that the total margins at Southwest locations appear to have been more stable than the total margins at the other nine locations. This is especially true of the Gulf-Local total margin. At most locations outside the Southwest region, the total margin to both markets began to decline substantially in 1980. And although the Gulf-Local total margin recovered some of the loss, the KC-Local total margin remained at the lower levels. The reason this happened is probably twofold: 1) the spread between the Gulf export price and the Kansas City cash price increased over the study period (discussed in the next section), and 2) the rail rate for transporting wheat to Kansas City decreased only about 40 percent of the amount Gulf export rail rates decreased from the first quarter of 1981 to the second quarter of 1983. The net result of these occurrences is that the Gulf-Local total margin was larger than the KC-Local total margin after deregulation for virtually all of the fourteen study locations; however, Marshall had a KC-Local total margin larger than the Gulf-Local total margin.

From the observations discussed above, it would seem that the Kansas City market is not as feasible to ship wheat to as it was prior to 1981. If this is true, then wheat receipts at Kansas City would be expected to have declined in the period after deregulation. According to the "1982 Annual Statistical Report" of the Kansas City Board of Trade, wheat receipts did indeed decrease from pre-1981 levels by 1982. Receipts at Kansas City were 96.5 million bushel in 1982 as compared to 107.5 million bushel in 1979 and 100.3 million bushel in 1980.[73]

As has been demonstrated, there were considerable differences between the Gulf-Local total margin and the KC-Local total margin at many locations and for much of the study period. Therefore, it is appropriate to examine the largest margin each location had available during each quarter for the whole study period. A new data series, the maximum total margin, was formed by taking the greater of the two total margins for each quarter. An analysis of variance model (identical to that done on each of the total margins separately) was used on this new data series. The time periods are also the same: 1) pre-deregulation is defined from the first quarter of 1978 to the fourth quarter of 1980, and 2) post-deregulation is defined from the third quarter of 1981 to the second quarter of 1983.

The results of the analysis of variance model are presented in Appendix C, Table 1. Based on the ANOVA table, there was no significant difference in the maximum margin after deregulation when all locations are aggregated. But the model also indicates that there was interaction between locations and the two time periods; therefore, each location must be examined individually with an LSD test and locations can be compared only within each time period. The LSMEANS procedure provided the means necessary to test for least significant differences and the output is also in Appendix C, Table 1.

Table 23 lists each location and its respective change in the maximum mean margin from before deregulation to after deregulation. Four of the five Southwest locations had no change, while Pratt's margin actually increased. Marshall and Mitchell were the only other locations which did not have

73. "1982 Annual Statistical Report," The Board of Trade of Kansas City, Missouri, Inc., 1983, p. 28.

significant decreases in their maximum mean total margin. This conforms to the earlier observation that the Southwest locations had more stable total margins over the study period.

TABLE 23. LSD Test of Pre-First Half-1981 vs. Post-First Half-1981 for the Maximum Mean Total Margin

	Change in Maximum Mean Total Margin	
Location	Significant*	Nonsignificant
	c/bu.	c/bu.
Pratt	4.21	
Scott		1.92
Ford		1.67
Finney		0.87
Seward		-0.66
Mitchell		-1.26
Marshall		-1.63
Russell	-3.63	
Cloud	-4.50	
Thomas	-6.39	
Saline	-7.49	
Sheridan	-7.79	
Cheyenne	-8.62	
Shawnee	-10.12	

*LSD = $(9.32 * (1/12 + 1/8))^{\frac{1}{2}} * 1.97 = 2.75$ c/bu.

Table 24 presents the LSD analysis on differences between locations for the three years prior to 1981. During this period, there were not many geographic tendencies in size of total margin. Most of the locations are dispersed throughout each other with no regional grouping. The exception is that the Northwest locations' margins were among the largest and were not significantly different from each other. In the Southwest region, Pratt had a maximum mean margin significantly smaller than all other Southwest locations.

Saline and Russell had significantly smaller margins than the margins at Mitchell and Cloud.

TABLE 24. LSD Test of Differences Between Locations in the 1978-1980 Period for the Maximum Mean Total Margin

				Location	Mean Total Margin c/hu.
			A	Cheyenne	23.03
		B	A	Thomas	22.35
	C	B	A	Seward	22.09
	C	B	A	Marshall	21.66
	C	B	A	Sheridan	21.58
	C	B	D	Mitchell	20.07
	C	B	D	Cloud	20.01
	C	E	D	Finney	19.63
	F	E	D	Ford	18.82
G	F	E	D	Scott	18.08
G	F	E	H	Saline	17.22
G	F		H	Shawnee	16.50
G			H	Russell	16.27
			H	Pratt	15.07

*LSD = $(9.32 * (1/12 + 1/12))^{1/2} * 1.97 = 2.46$ c/hu.
Means with the same letter are not significantly different.

The 1981-1983 period was characterized by geographic patterns in the maximum mean total margin (Table 25). The Southwest locations had five of the seven largest margins along with Marshall and Mitchell. The maximum mean margins of the Northwest locations were not significantly different. Another interesting result is that the two locations near terminal elevators, Saline and Shawnee, had maximum margins significantly smaller than all other locations. This phenomenon may have been due to a higher level of competition or it could be the result of an actual transportation rate smaller than that rate

TABLE 25. LSD Test of Differences Between Locations in the 1981-1983 Period for the Maximum Mean Total Margin

		Location	Mean Total Margin c/bu.
	A	Seward	21.43
	A	Finney	20.50
	A	Ford	20.49
	A	Marshall	20.03
	A	Scott	20.00
	A	Pratt	19.28
B	A	Mitchell	18.81
B	C	Thomas	15.96
D	C	Cloud	15.51
D	C	Cheyenne	14.41
D	C	Sheridan	13.79
D		Russell	12.64
		Saline	9.73
		Shawnee	6.38

$^{*}LSD = (9.32 * (1/8 + 1/8))^{1/2} * 1.97 = 3.01$ c/bu.
Means with the same letter are not significantly different.

used in the analysis being available at these two locations.

Hence, this analysis on the maximum mean total margin shows that the Southwest locations have experienced fairly stable margins around 20 cents per bushel. In contrast, the other locations experienced more fluctuation in their mean margin over the six and one-half year period. Additionally, these maximum margins were in some cases about equal to the margin in the Southwest, but mostly were smaller.

Gulf-Kansas City Price Spread As was discussed earlier in the definition of the Gulf-Kansas City (Gulf-KC) spread, the maximum spread was limited by the cost of transportation for shipping wheat from Kansas City to Gulf ports.

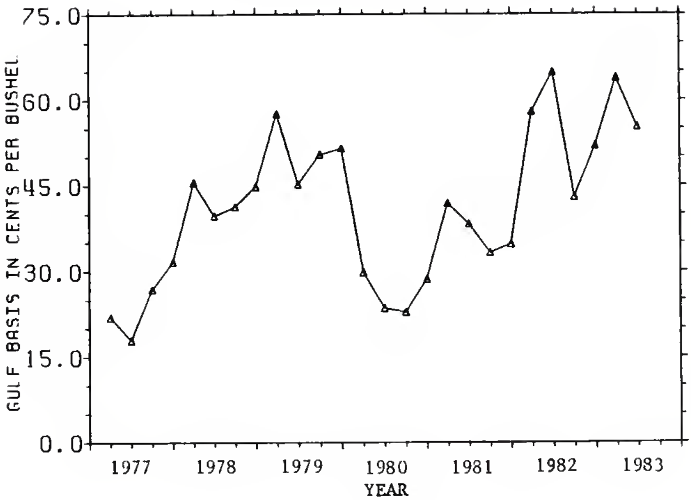
Millers and processors are reported to bid wheat up in Kansas City relative to the Gulf price in the latter part of the crop year. Therefore, the analysis discussed below investigates the change in the Gulf-KC spread over the study period with special interest in whether there was a significant decrease in the spread after January 1, 1981 when the non-transit, volume rates out of Kansas City took effect. Also examined is the spread relationship among the crop year quarters to see if the Gulf-KC spread was significantly smaller in the fourth quarter.

The Gulf cash (to arrive) price is calculated by adding the Gulf Basis to the appropriate Kansas City futures settlement price. In spite of erratic behavior of the Gulf Basis, especially in 1980 (Figure 9), the price spread for cash grain at Kansas City and the Gulf of Mexico continued to relate more closely to transportation costs than to the Gulf Basis. The quarterly means of the Gulf-KC spread are in Appendix D, Table 1; also, they are plotted in Figure 10 along with the average balance of the through rate from Kansas City to the Gulf.[74] There is quite a contrast between Figure 9 and Figure 10.

The Gulf-KC spread did not decrease as much as the Gulf Basis in 1980 and the decrease occurred only in the second quarter. Except for second quarter-1980, the spread continued to increase with its upper limit being the average balance of the through rate from Kansas City to the Gulf; this specific limit was applicable only until January 1981 when the volume rates from Kansas City to the Gulf were instituted. After that time, it is expected that the Gulf-KC spread would be restricted by the average cost of shipping wheat to the Gulf from Kansas City, whether by barge or by unit-train. Hence, the Gulf-KC

74. Average balance of the through rate data series is from: Maydew, pp. 81-82.

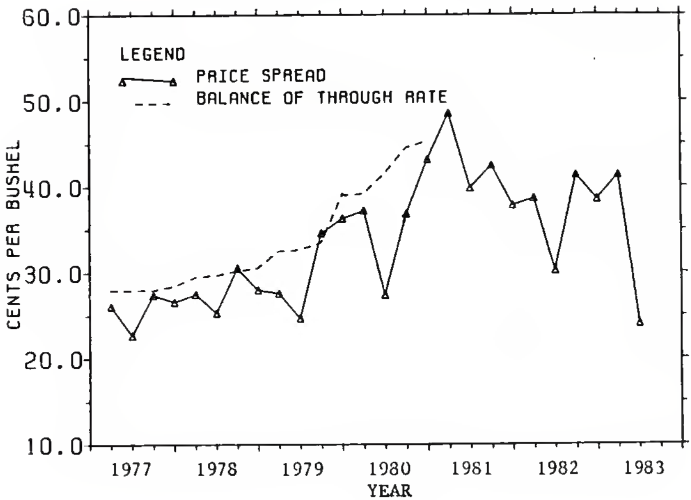
FIGURE 9
GULF BASIS
BY QUARTER FROM 1977 TO 1983



spread should give an indication of what minimum export rail rates from Kansas City have been since January 1981. As demonstrated in Figure 10, the Gulf-KC spread hardly ever exceeded the average balance of the through rate, although it often was smaller. Consequently, the same behavior could be expected after 1980; that is, the larger spreads would be indicative of the average transportation cost to ship wheat to the Gulf.

The average balance of the through rate out of Kansas City for the fourth quarter of 1980 was about 45.3 cents per bushel. This compares to a price

FIGURE 10
GULF-KANSAS CITY PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



spread of 43.1 cents per bushel for the same period. The price spread rose even more in the first quarter of 1981 to 48.5 cents per bushel; the volume rates began in this quarter and they were estimated at 78 cents per hundredweight, or 46.8 cents per bushel. Hence, the close relationship between the average transportation cost and the maximum Gulf-KC spread remained. Assuming this relationship held over the balance of the study period, it appears the average cost of exporting wheat to the Gulf of Mexico declined. The maximum, quarterly Gulf-KC spread for the 1981 and 1982 crop years were 42.4 cents per bushel and 41.3 cents per hushel, respectively. This suggests an average rail rate around 69-71 cents per hundredweight for wheat shipments from Kansas City to the Gulf. On January 1, 1982, the 25-car, non-transit, Gulf export rail rate from Kansas City was 83 cents per hundredweight.[75] The rail rate for 50 or more cars, or a contract rate would he less than the 83 cents. It is possihle these rates were very near the 71 cents per hundredweight level of the spread. If so, then the cost of shipping wheat to the Gulf from Kansas City has decreased since deregulation.

For each crop year, it appears that the fourth quarter usually had the smallest Gulf-KC price spread. This conforms to the previously discussed idea of the Kansas City cash price heing hid up hy domestic huyers. In order to compare the spreads in each quarter of the crop year for the six crop years the study covers, an analysis of variance was performed on a modified series which removes the variation from one crop year to the next. The modified series puts each quarter's price spread in terms of a percentage of its respective crop year average. The ANOVA tahle produced hy the SAS GLM procedure is in Appendix D, Tahle 2. The model is highly significant at $\alpha=.05$, indicating there were differences hetween crop year quarters in their Gulf-KC price spread. The LSMEANS procedure provides the prohahilities that any two quarters were not significantly different; these results are also in Appendix D, Tahle 2. From this analysis, it can he concluded with at least 95 percent certainty that the fourth quarter had a smaller price spread than the other three quarters of the crop year. In addition, the price spreads in the first three quarters of the crop year were not significantly different from each other. Over the six crop years, the mean fourth quarter price spread was 84.4

75. Kansas City Board of Trade Grain Rate Book, No. 47.

percent of the crop year's average price spread. This compares to an average of 105.1 percent for the mean price spread of the first three crop year quarters. These tests support the hypothesis that the Gulf-KC spread was smaller in the fourth quarter of each crop year.

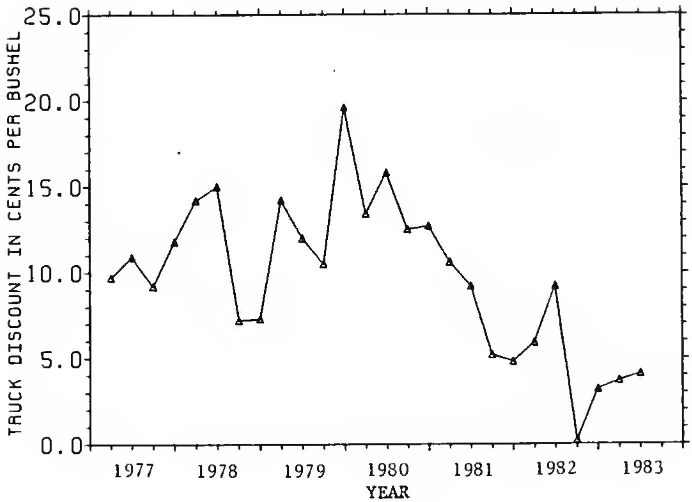
The relative variability of the Gulf-KC spread for each quarter within a crop year as measured by the standard deviation of the weekly observations also warrants analysis. The quarterly standard deviation of the Gulf-KC spread is listed in Appendix D, Table 1. Since both the mean and the standard deviation of the spread were generally higher in the latter part of the study period, the standard deviation can best be examined by transforming the data into percentages of the respective crop year average as was done for the quarterly mean of the Gulf-KC spread. The SAS GLM procedure is used to test for significant differences between any two crop year quarters' variability. The ANOVA table and the LSMEANS result are in Appendix D, Table 3. The F-test of a crop year quarter effect is highly significant at $\alpha=.05$. Hence, the LSMEANS can indicate which quarters differ from one another. With $\alpha=.05$, the first quarter's variability was significantly smaller than all other quarters' variability; the mean standard deviation for the first quarter was 62 percent of the crop year average. The second and third quarters had variabilities which did not differ significantly from each other and their mean level was 101.9 percent of the crop year average. The fourth quarter had a relative variability only significantly larger than the variabilities the first and third quarters had. The fourth quarter would be expected to have a higher variability since the mean Gulf-KC spread was significantly smaller in the fourth quarter as compared to the rest of the year; the standard deviation increases as the range of values within the quarter increases.

In summary, from 1977 through 1980, the Gulf-KC spread continued rising at a rate corresponding to the balance of the through rail rate from Kansas City. The price spread after volume rates were initiated in January 1981 suggests that the cost of transporting wheat to the Gulf from Kansas City was lower in the last two years of the study period (July 1, 1981 through June 30, 1983) than the level reached in January 1981. Finally, it was found that besides seasonality in the quarterly mean Gulf-KC spread, there were also differences between crop year quarters in their price spread variability. The first quarter of the crop year was the least variable.

<u>Truck Discount</u> The truck discount is presented in Figure 11. As would be expected, the truck discount did indeed decrease after deregulation. In the fourth quarter of 1980, the truck discount averaged 12.7 cents per bushel; in contrast, the truck discount was only 0.2 cents per bushel in the third quarter of 1982. This is a significant decline considering the lowest quarterly truck discount in the four years prior to deregulation had been 7.2 cents per bushel in the third quarter of 1980.

Besides the post-deregulation decline in the general level of the truck discount, another relationship is apparent. Within each crop year (3rd Qtr.-1977 to 2nd Qtr.-1978, etc.), the truck discount usually increased from one quarter to the next quarter. This pattern may be because the Gulf export market becomes less of a factor in Kansas City as the crop year progresses. Also, the transit system makes wheat arriving on rail less expensive to ship to Eastern destinations than wheat with no rail billing. However, barge shipment to the Gulf could sometimes be an alternative for the wheat with no rail billing.

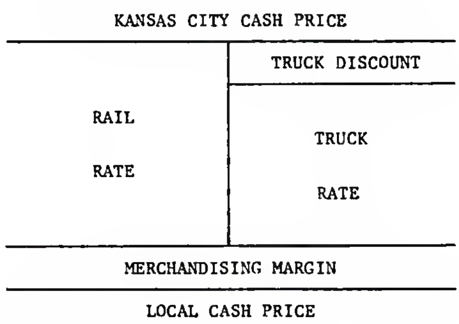
FIGURE 11
KANSAS CITY TRUCK DISCOUNT
BY QUARTER FROM 1977 TO 1983



To analyze the data discussed above, the SAS autoregressive procedure was used. The variables included in the multiple regression model are: 1) a time trend variable to estimate the overall slope, 2) a crop year quarter variable to remove the quarterly trend within each crop year, and 3) dummy variables to estimate the decline from the first quarter of the 1980 crop year to each of the periods, last half of crop year 1980, crop year 1981, and crop year 1982. These data and the results of the statistical analysis are presented in Appendix D, Table 4.

The analysis found each independent variable to be highly significant at the $\alpha=.05$ level in explaining the truck discount. After taking account of autoregressive parameters, the model was able to explain over 93 percent of the truck discount's variation. The results of this analysis confirm that the truck discount increased progressively throughout the crop year. Also confirmed is that the truck discount was significantly smaller in the three periods after 1980 (defined earlier) as compared to the level in the first quarter of the 1980 crop year; in fact, each period was lower than the period preceding it. Although most of these conclusions are evident in Figure 11, the regression analysis has provided a measurement of the various effects on the truck discount.

FIGURE 12. Components of the Kansas City-Local Price Spread



Conceptually, the spread between the Kansas City cash price for rail-delivered wheat and the local elevator price is made up of a merchandising margin and either the rail rate to Kansas City, or the truck rate to Kansas City plus the truck discount. Figure 12 illustrates this concept. At any point in time, the merchandising margin is constant. Therefore, assuming average truck rates have remained fairly constant since December 1980, a change in the truck discount should equal the change in the rail rate from the local elevator to Kansas City. To check this, the decrease in the truck discount from the third quarter of calendar year 1980 to the third quarter of calendar year 1982 is compared to the average decrease in the rail rate to Kansas City from the fourteen study locations for the period, first quarter of 1981 to the second quarter of 1983 (Table 7). The periods do not directly coincide because of the seasonality of the truck discount and the delay before the new mileage rates to Kansas City were initiated during the second quarter of 1981. The quarterly truck discount decreased 12.3 cents per bushel(12.5 - 0.2 = 12.3) and the average rail rate decreased 14.0 cents per bushel. These figures agree with the hypothesis described above. They suggest that virtually all transport savings for rail shipments to Kansas City have also been passed on to shippers delivering wheat by truck in the form of a reduced truck discount. This does not, however, provide any evidence on whether local prices have adjusted fully to the reduced transportation cost. This evidence lies in the earlier sections on the Gulf-Local price spread and the Kansas City-Local price spread.

The major conclusions of this section are: 1) the truck discount exhibited seasonality — increasing throughout the crop year, 2) the truck discount has decreased significantly since deregulation, and 3) the decrease in the truck discount approximated the decline in the average rail rate to Kansas City (from study locations). Subsequently, it appears that the

Staggers Act has resulted in an improved competitive position for motor carriers in the Kansas wheat market.

VIII. ANALYSIS OF NON-TRANSPORTATION FACTORS AFFECTING PRICE SPREADS

It is obvious from the previous chapter's discussion that transportation cost is the most significant factor affecting inter-market price spreads. However, transportation cost is only one part of total transfer costs associated with shipping wheat from an origin elevator to a destination market. The additional differential between two markets' prices not accounted for by transportation cost was termed a "total margin" in the last chapter. The maximum total margin at each location exhibited considerable variation over time and apparently changed significantly after the first half of 1981 for some locations under study. Hence, it is useful to understand those additional factors which may comprise the total margin and have created the observed variation.

Description of Non-Transportation Factors

Theoretically, the total margin should consist only of other transfer costs associated with merchandising the grain. Such transfer costs include charges for the physical handling of the wheat (elevation, storage, etc.) as well as a fee for the merchandising function provided by local elevator personnel or terminal merchants. This definition assumes that the prices at each market are for wheat of equivalent quality. Thns, if the local elevator price reflects indirectly a higher than average wheat quality, then the total margin would be decreased, holding all other factors constant. The charges made for handling the grain may also vary depending on the market environment. Concerning market environment, the local supply-demand conditions may exert an influence on the margin by increasing or decreasing the competitiveness among buyers of wheat. For example, if sales by farmers are exceeding the current demand, then merchants may widen their "profit" margins to the point where country movement more nearly matches their current needs. This type of variation is more short-term in nature, although a general weakness in the entire wheat market would pressure merchandising margins for long time periods, possibly even more than a year. The total margin is also sensitive to market shocks like embargoes, transportation shortages, or lack of storage space. With this many factors affecting the total margin, it is not surprising that the total margin portion of the price spread exhibited substantial variation. Under the assumption of a competitive Kansas wheat market, this variation apparently is justified by market forces. It follows that this variation should be explainable by examining the maximum total margin at all fourteen locations in relation to various measurable market factors. This investigation is discussed in the following section.

Multiple Regression Results

Multiple regression is used to analyze the factors possibly affecting the maximum total margin. Since wheat quality and local supply data are only available for each location on a crop year basis, the regression uses annual figures for all variables included in the analysis. Furthermore, all fourteen locations′ data are included in one model because there are only six observations (crop years) for each location. The data included are for the crop years 1977 through 1982. The variables are defined below.

The independent variable is the maximum total margin. It is the larger of the Gulf-Local total margin and the Kansas City-Local total margin in each quarter. This variable was also studied in Chapter VII by analysis of variance to test for differences between locations and over time.

When the quality of the wheat purchased by a local elevator is relatively better than the average quality, it is hypothesized that the local bid to farmers would partially reflect the higher value that wheat would have when it is sold in the major markets. A measure of quality is the protein content. Hence, one independent variable is the annual wheat protein content of the county in which each location lies. The protein content is collected from the appropriate issues of the "Kansas Wheat Quality" report as compiled by the Kansas Crop and Livestock Reporting Service. When protein content increases, the origin's relative price is expected to increase and therefore, the maximum total margin is expected to decrease; a negative sign is expected on the coefficient estimate.

Although protein content may improve from one year to the next, there is no certainty that the relative value of the higher protein wheat will also increase since the supply of high protein wheat may be adequate. Therefore, a second model is used which replaces protein content with the average annual premium for wheat of that protein content over the value of ordinary protein wheat. This premium is calculated by suhtracting the high end of the ordinary protein basis range of the Kansas City Protein Premium Scale from the high end of the basis range associated with the specific protein content unique to the location and crop year. The Protein Premium Scale is published in the "Kansas City Grain Market Review." Again, it ia expected that as the premium rises, the maximum total margin will decrease; the coefficient estimate is expected to he negative.

To see if a change in the number of local elevators causes the maximum total margin to change significantly, a variable is included in the model which represents the numher of firms buying wheat at that location as compared to the number in 1977. The number of firms was estimated by using the Kansas Official Directory of the Kansas Grain & Feed Dealers Association for the years 1976 through 1983. When the number of firms purchasing wheat at a specific location increases, it is expected thst there may be more competition for the available grain traffic. If indeed this happened, the coefficient estimate should be negative.

The third independent variable measures the effect of the relative proportion of Kansas storage space occupied by Kansas wheat. The variable is defined as the average annual off-farm stocks divided by the total Kansas commercial grain storage capacity; this can be thought of as a percent utilization of storage space since wheat is the major grain stored in Kansas. The wheat stocks data are from various issues of Kansas Farm Facts except for 1982 crop year data which was obtained directly from the Kansas Crop and Livestock Reporting Service. The volume figures for the commercisl storage capacity are from various issues of Farm Facts also. As a larger share of storage space is utilized to store wheat, the firms are earning more revenues on storage charges. Consequently, managers may be able to lower their merchandising margins and pass through more of the wheat's final sale value to the farmer. An increase in the amount of stocks could also indicate that demand for wheat is weak and the firms must compete among themselves to make the available sales; again, margins may be pressured by this market environment. Based on these explanations, the coefficient estimate should be negatively signed.

In contrast to a storage environment, a market which is moving a lot of wheat would provide more discretion to market participants in the charges they assess. It seems that it would be easier to charge more for services when grain traffic increases. The variable which measures the volume of grain moved through the system is defined as the total dissappearance of wheat in Kansas divided hy the total Kansas commercial grain storage capacity; this represents the statewide turnover rate. The total dissappearance is calculated by adjusting annual production hy the net change in stocks. Data to calculate the total dissappearance are from "Kansas Wheat Quality" reports. If, as suggested, the total margin increases as the turnover rate increases, the coefficient estimate should have a positive sign.

Because earlier analysis indicated a shift in some locations' maximum total margin after deregulation, a dummy variahle is included to account for this effect. The variable is zero for the crop years 1977 through 1980 and is one for the 1981 and 1982 crop years. It should he realized that the dummy variable will measure the average effect across all fourteen locations. Consequently, it may end up heing insignificant. Also, the other variahles incorporated in the analysis may explain part of the general decrease in the maximum total margin ohserved earlier in Chapter VII.

Earlier analysis also suggested that the average maximum total margin at each of the fourteen locations were not all equal. Thus, a dummy variahle is provided to differentiate hetween locations. Saline is the location to which the dummy variahles reference the other thirteen locations.

The two models are as follows:

1) $\text{MAXMG} = \alpha + B_1(\text{PROT}) + B_2(\text{CELEV}) + B_3(\text{KSUTIL}) + B_4(\text{KSMOVM}) + B_5(\text{DMY}) + B_6(\text{CHEYENNE}) + \ldots + B_{18}(\text{THOMAS})$

2) $\text{MAXMG} = \alpha + B_1(\text{PNPREM}) + B_2(\text{CELEV}) + B_3(\text{KSUTIL}) + B_4(\text{KSMOVM}) + B_5(\text{DMY}) +$

B_6(CHEYENNE) + . . . + B_{18}(THOMAS)

where,

MAXMG = Maximum total margin

PROT = Protein content

PNPREM = Relative protein premium

CELEV = Change in number of elevators

KSUTIL = Utilization of commercial storage

KSMOVM = Relative wheat movement

DMY = Time dummy

and location dummy variables for the thirteen locations.

The results of these two models are presented in Appendix E along with the data used. The model using protein content as the quality variable is able to explain more of the total margin variation. Furthermore, the two models' results are not in total agreement as to the effect of a higher quality (or higher premium) wheat and the effect of relative wheat movement (KSMOVM). Consequently, each model's results must be evaluated with the other model's inferences in mind.

The most significant variable of the first model is KSUTIL. With a coefficient of -37.67, it implies that the total margin decreased 0.38 cents per bushel for every percentage point increase in the proportion of commercial storage space occupied by wheat stocks. The coefficient on the protein content variable is significant at α=.06 and has the expected sign. The coefficient estimate suggests that total margins decreased about 2.0 cents per bushel for every percentage point increase in the wheat protein content. The CELEV variable has the right sign, but is not significantly different than zero. The fourteen locations did not have a decrease in their average aggregate total margin after deregulation. Only Finney, Marshall, and Seward had total margins significantly greater than Saline. In fact, Shawnee was the only location that indicated its total margin may be less than Saline's.

The second model using protein premium rather than protein content explains about two percent less of the maximum total margin's variability than the first model does, but the PNPREM variable is not significantly different than zero and has a positive sign which is opposite to the effect expected; it seems unreasonable that the total margin increased when the local wheat became more valuable relative to ordinary protein wheat. The interesting result of this model is the significance of the KSUTIL and KSMOVM variables with expected signs. Again, the KSUTIL variable suggests that the total margin decreased around 0.32 cents per bushel for every percentage point increase in the percent of commercial grain storage occupied by Kansas off-farm wheat stocks. As hypothesized, the total margin increased as the statewide turnover rate (KSMOVM) increased. The coefficient estimate suggests that margins increased 0.72 cents per bushel for every percentage point increase in the annual dissappearance of Kansas wheat relative to Kansas commercial grain storage capacity. Although the dummy variable for the time effect is nonsignificantly different than zero, it has a positive sign which disagrees with previous analyses. Finney and Seward had total margins significantly larger than Saline. The other eleven locations' maximum total margins were not significantly greater or lesser than Saline's maximum total margin.

The first and second models explain 35.33 percent and 33.53 percent of the variation, respectively. Despite this similarity, there are major differences in what the models imply about the Kansas wheat market's pricing mechanism. The first model suggests that higher protein wheat was partially compensated for in tbe local elevator bid to farmers. The second model suggests tbat tbe local price was not affected by tbe local wbeat's relative value based on the protein premium; instead, a significant proportion of tbe variation appears to be explained by tbe utilization of storage space and the volume of Kansas wheat used eacb year. However, botb models indicate tbat total margins decreased when more grain was stored in commercial elevators.

Altbougb tbis analysis has found some explanation of total margin bebavior, more detailed information on eacb elevator including sbipments, market area, fixed costs, competition, etc. is necessary to more fully analyze tbe maximum total margin.

IX. PRICING PERFORMANCE IN THE KANSAS WHEAT MARKET

In earlier sections of this paper, the Kansas wheat market has been assumed to be highly competitive such that no firms have the power to control prices and subsequently widen "profit" margins unjustifiably. Results of Chapter VII support this assumption insofar as the evidence suggested that the total margin did not increase significantly statewide after deregulation. Although that finding supports a competitive market, the prices and their behavior are examined more fully to evaluate pricing performance in the Kansas wheat market.

Meaning of Pricing Performance

Pricing performance is one result of the market structure which exists in an industry. Performance describes how prices behave. Performance can be evaluated by examining the pricing efficiency of the market. Bressler and King encourage the study of market performance, including pricing efficiency, prior to investigating the market structure.[76] According to them, pricing efficiency is examined by comparing actual prices to prices expected to occur in an efficient market. Efficient prices, in general, would be "interrelated through space by transportation costs, through form by costs of processing, and through time as a consequence of the costs of storage."[77]

The study by Thompson and Dahl reviewed in Chapter III is by their own accord a "performance-oriented approach as suggested by Bressler and King."[78]

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76. Raymond G. Bressler and Richard A. King, Markets, Prices, and Interregional Trade, (New York: John Wiley & Sons, Inc., 1970), p. 413.

77. Ibid., p. 413.

78. Thompson and Dahl, p. 4.

To reiterate, they performed several tests on price differentials among spatially separated markets and concluded that the U.S. grain export industry exhibited efficient pricing performance. Therefore, to examine the pricing performance of the Kansas wheat market, similar tests are done below.

<u>Test for Efficiency in Kansas Wheat Prices</u>

There are fourteen adjusted price spreads analyzed. These are the price differentials between each of the fourteen Kansas elevators (origins) and either the Gulf or Kansas City (destination), depending upon which location gives the best net price adjusted for transportation (e.g. Gulf price - transportation). Each week the best adjusted destination price is determined for each of the fourteen country locations. In any week, the best adjusted destination price may vary from location to location since respective transportation rates to the Gulf and Kansas City are mostly unique to a single location. The resulting differential between the adjusted destination price and the local elevator price approximates the "maximum total margin" analyzed in Chapter VII, except that the present data are based on weekly observations rather than quarterly averages.

The first test of pricing efficiency is the measurement of the relationship between the origin price and the best adjusted destination price for each of the fourteen study locations. According to Thompson and Dahl's study, a strong relationship is indicated by a large coefficient of determination (R^2) and a slope coefficient near 1.0 when the adjusted destination price is regressed on the origin price. Therefore, regressions were performed using the best adjusted destination price as the dependent variable; the independent variables included not only the origin price, but also a dummy variable to account for the shift in the mean difference between the two prices after the first quarter of 1981 which was indicated in Chapter VII for some locations through analysis of variance and Least Significant Difference (LSD) tests. The dummy variable has April 2, 1981 as its effective date.

The results of the regression analysis are in Table 26. Besides giving the coefficient estimates, their significance, and the coefficient of determination, the result of an F-test to see if the coefficient for the origin price is significantly different than 1.0 is reported. The smallest coefficient of determination (R^2) for the fourteen locations is .9815 at Seward. Hence, the variation of the origin price is very well explained by the adjusted destination price, and vice versa. Although the R^2 terms only vary over a .134 range, there are reasonable patterns in the R^2 terms. The locations having the four smallest coefficients of determination are either near terminals (Saline, Shawnee) or at extreme points in Kansas (Cheyenne, Seward). Terminals may not follow the Gulf and Kansas City prices quite as close since they are themselves a market for country elevator grain and their price could be influenced also by several other market alternatives. As for Cheyenne and Seward, it may be that these two locations can ship to markets west of Kansas competitively. Another reason for the lower correlation could be that the local price is not responding to price changes as quickly as do most other Kansas elevators.

TABLE 26. Relationship Between Origin Prices and Adjusted Destination Prices

Location	Fitted Regression Line	Significance of intercept alpha=	Significance of slope alpha=	Slope significantly different than 1, alpha=.01	Significance of dummy alpha=	Adjusted Coefficient of determination (R^2)
Cheyenne	$DP^* = .085 + 1.043(OP^*) - .082(0^*)$	.0001	.0001	YES	.0001	.9899
Cloud	$DP^* = .132 + 1.016(OP^*) - .029(0^*)$	.0001	.0001	YES	.0002	.9913
Finney	$OP^* = .004 + 1.058(DP^*) + .009(0^*)$	.7875	.0001	YES	.1739	.9937
Ford	$OP^* = .053 + 1.041(OP^*) + .014(D^*)$	.0001	.0001	YES	.0153	.9949
Marshall	$DP^* = .060 + 1.042(OP^*) - .012(0^*)$	.0023	.0001	YES	.1476	.9904
Mitchell	$DP^* = .175 + 1.004(OP^*) + .009(0^*)$	.0001	.0001	NO	.2432	.9917
Pratt	$OP^* = .138 + 1.003(OP^*) + .046(0^*)$	.0001	.0001	NO	.0001	.9939
Russell	$DP^* = .145 + 1.002(OP^*) - .020(0^*)$	.0001	.0001	NO	.0150	.9910
Saline	$DP^* = .208 + 0.988(OP^*) - .053(0^*)$	.0001	.0001	NO	.0001	.9900
Scott	$OP^* = .003 + 1.053(OP^*) + .025(0^*)$	.8505	.0001	YES	.0004	.9922
Seward	$DP^* = .083 + 1.040(OP^*) - .007(0^*)$	.0050	.0001	YES	.3802	.9815
Shawnee	$DP^* = .129 + 1.003(OP^*) - .068(0^*)$	.0001	.0001	NO	.0001	.9871
Sheridan	$DP^* = .079 + 1.039(DP^*) - .062(0^*)$	.0001	.0001	YES	.0001	.9929
Thomas	$OP^* = .099 + 1.037(OP^*) - .049(0^*)$	.0001	.0001	YES	.0001	.9904

*OP = Best adjusted destination price (\$/bu.), OP = Origin price, 0 = Dummy variable.

All slope coefficient estimates were significantly different than zero as would he expected. However, only five locations had slope coefficients not significantly different from one, which indicates a one-to-one relationship hetween origin and destination prices. Compared to the other nine locations, these five locations are the closest to the appropriate terminal; Russell, Mitchell, and Saline are near Salina; Shawnee is near Topeka; and Pratt is the closest study location to Wichita-Hutchinson. Also note that Saline had the only slope which was less than one. For those locations with slope coefficients significantly greater than one, there is evidence that suggests the origin price and adjusted destination price get farther apart as the price level increases. In other words, the total margin increases as the price increases and this implies a percentage-based total margin. Since the total margin includes all other transfer costs and the merchandisers' "profit margin," it is difficult to specify where this effect may he attributed.

The intercept terms are not directly comparahle to the estimates of 1978-1980 maximum total margins in Chapter VII because the slope coefficients hias the intercept downward. On the other hand, the dummy coefficients should approximate the decline in the mean maximum total margin found in Chapter VII, Tahle 9; they may differ hecause the present data covers the entire six and one-half years on a weekly hasis and the previous quarterly analysis excluded a total of one and one-half years of data. Except for Ford, Finney, and Seward, the present analysis indicates a larger decrease in the adjusted price spread, or total margin, after deregulation than the LSD tests did in Chapter VII. The additional decrease ranges from 0.4 to 3.3 cents per hushel.

From the regression analysis, it appears that local prices follow quite closely the prices at destination markets after adjustment for transportation costs, other transfer costs, and the deregulation effect. Nevertheless, there does appear to be some intricasies in the price behavior as indicated by the slope coefficients. Therefore, more analysis is needed to further characterize pricing efficiency.

After regressing the adjusted destination price on the origin price, Thompson and Dahl, in their study, then examined the randomness and normality of the differential between the two aforementioned prices. Because of the significance at many of the study locations of the deregulation effect as indicated by the regressions, the current study will examine randomness and normality of the residuals from the previously reported regressions (Table 26) instead of the adjusted price differentials. The residuals are distributed similar to the adjusted spread itself since each regression has only an intercept, one slope, and a shift variable; the shift variable removes any overall mean effect that might have occurred after the first quarter of 1981. Consequently, the residuals are a better representation of price spread behavior.

To examine the randomness of the residuals, they were plotted over time to see if there appeared to be patterns in the residuals. Patterns were clearly evident for all locations. In fact, there was similarity among the locations in their residual patterns. This would be expected somewhat, considering the results of the analysis in Chapter VIII which suggested that wheat quality, commercial storage utilization, and/or wheat usage may affect total margins. Market shocks like rail car shortages, embargoes, etc. can also create non-random price spread behavior. For brevity, these time plots of residuals are not presented. However, one can get an idea of the similarity between locations by examining the plots of total margins of both the Gulf-Local and the Kansas City-Local price spread (Appendix B, Figures 15-18 and Figures 33-36).

Despite the evidence indicating non-randomness of the adjusted price spread as represented by the residuals, the distribution of residuals would be expected to be normally distributed around a mean of zero if the adjusted price spread was as likely to be above the average spread as it was to be below the average and similarly, was more likely to be near the average spread as it was to be far away from it. This concept just discussed was used by Thompson and Dahl in their study on the actual adjusted price spread distribution.

To examine the normality of the residuals referred to above, the SAS UNIVARIATE procedure was used. Selected statistics from each location's analysis are in Table 27 and they include the standard deviation and the Kolomogrov D statistic with its associated probability of being larger. The standard deviation indicates the amount of variability from the mean that existed in each location's residuals; the smaller the standard deviation is, the less variable was the adjusted price spread. In other words, it represents the distance from the mean that most of the weekly observations would be expected to fall. The most important statistic reported is the test for the normal distribution of the residuals.

The standard deviations of the residuals ranged from .047 dollars per bushel at Ford to .077 dollars per bushel at Shawnee. These figures suggest that most of the time each location's adjusted price spread did not vary from its respective mean level by an unreasonable amount. It's even possible that other market factors not accounted for in the regression justify the 5 to 8 cents per bushel variation exhibited at the fourteen locations.

TABLE 27. Normality Statistic and Standard Deviation of the Residuals from the Regression on Adjusted Price Spread

Location	Kolomogrov's D Statistic	Significance alpha=	Standard Deviation of Residual
			$/bu.
Cheyenne	.0690	.01	.063
Cloud	.1133	.01	.062
Finney	.1094	.01	.051
Ford	.0759	.01	.047
Marshall	.0855	.01	.066
Mitchell	.1134	.01	.061
Pratt	.0908	.01	.052
Russell	.0630	.01	.063
Saline	.0726	.01	.069
Scott	.0690	.01	.057
Seward	.0630	.01	.063
Shawnee	.1085	.01	.077
Sheridan	.0801	.01	.054
Thomas	.0774	.01	.063

Normality of the residuals is not rejected based on the Kolomogrov D statistic. Although the statistics vary in magnitude, each location's statistic is significant at α=.01. The SAS UNIVARIATE procedure also produced frequency distribution bar charts and normal probability plots for each location's residuals. These graphic displays of normality (not shown) support the conclusion that the residuals from each regression on the adjusted price spreads are normally distributed.

Thus, the complete analysis on the pricing performance of the Kansas wheat market presents evidence suggesting: 1) a very strong relationship between the local price and the location's best adjusted destination price, 2) non-random behavior of the differential between origin and destination prices, 3) a normal distribution of this same differential when it is examined for the entire study period from January 1977 through June 1983, and 4) that most adjusted price spreads cluster within 5 to 8 cents per bushel of the respective location's mean adjusted price spread. Inasmuch as these results parallel those of Thompson and Dahl regarding the U.S. grain export industry, there appears to be sufficient evidence to conclude that the Kansas local elevator wheat prices are efficient.

X. CHANGES IN GEOGRAPHICAL PRICE RELATIONSHIPS

Previous discussion has focused on the two components of the price differential between a local elevator and a major market; these components are the transportation cost and the total margin. Regardless of how each of these components behave individually, their joint effect determines how one location's price relates to another location's price. Examination of geographical price relationships clearly show how each location has faired relative to any other location with respect to the price level for wheat. Producers are especially interested in how their local wheat price compares to the wheat price at other locations in their part of the state, as well as across the entire state. Changes in geographical price relationships between the local elevators and the major markets and between selected country elevators are discussed in the following sections.

Between Country Elevators and Major Markets

The price spreads between each of the fourteen Kansas locations and the Gulf of Mexico are illustrated in Appendix B, Figures 1 through 14 and between each elevator and Kansas City in Figures 19 through 32. It is evident that these price spreads decreased after deregulation. However, not all locations experienced the same amount of decrease. Comparison of each location's decrease in spread can best be achieved by measuring the decrease from the first quarter of 1981 to the first quarter of 1983; the first quarter is used for both years to avoid any seasonality effect that may have existed. Table 28 lists the decrease in the Gulf-Local price spread for each location. The decreases range from 5.8 cents per bushel at Seward to 32.3 cents per bushel at Saline. After Saline, the three locations in the Northwest region had the

TABLE 28. Decrease in the Gulf-Local Price Spread from First Quarter-1981 to First Quarter-1983

Region	Location	Change in Spread by Location	Change in Spread by Region
		c/bu.	c/bu.
---	Saline	32.3	----
Northwest	Cheyenne	29.9	30.3
	Sheridan	30.6	
	Thomas	30.5	
Central	Cloud	17.7	20.1
	Mitchell	20.7	
	Russell	21.9	
Southwest	Finney	19.6	17.7
	Ford	15.8	
	Pratt	16.5	
	Scott	19.0	
Northeast	Marshall	9.0	9.8
	Shawnee	10.6	
---	Seward	5.8	----

largest decreases, averaging 30.3 cents per bushel.

The Central region, excluding Saline, and the Southwest region, excluding Seward, averaged decreases of 10.2 and 12.6 cents per bushel, respectively, less than the average decrease for the Northwest region. Although there are only two locations in the Northeast region from which to estimate a decrease, it appears that the Northeast had only half as much of a decrease in the Gulf-Local price spread as did the Central and Southwest regions -- 20.5 cents per bushel less than the Northwest's decrease. Assuming other market factora did not have an appreciable effect on these measured decreases, producers in the Northwest gained the most in their wheat price relative to the rest of the state, excluding Saline. In contrast, Northeast producers have apparently benefitted the least in their relative wheat price increase; however, Seward in the Southwest did have a smaller decrease in the Gulf-Local price spread.

Changes in the Kansas City-Local price spreads for the same time period as discussed above would be 7.2 cents per bushel less than the changes listed for the Gulf-Local price spread. This is because the Gulf-Kansas City price spread narrowed 7.2 cents per bushel from the first quarter of 1981 to the first quarter of 1983. Therefore, the Northwest had the largest average decrease and the Northeast had the smallest average decrease in the Kansas City-Local price spread.

The results discussed above agree with the expected results for a period of decreasing transportation costs. It was reported earlier in Chapter V that according to Tomek and Robinson, more distant producing areas should benefit more from a decrease in transportation costs than should nearby producing areas.

Between Selected Kansas Local Elevators

It has been shown that the decrease in the Gulf-Local price spread varied from region to region; this indicates that the price spread between any two local elevators also changed by different amounts depending on which locations are compared. The geographical price relationships among the fourteen Kansas locations can best be examined through time plots which display specific price spreads over the entire study period.

Since Saline had the largest decrease in the Gulf-Local price spread, it is interesting to see how each location's price compares to the Saline price from 1977 through 1983. Therefore, the price spread between Saline and each of the other thirteen locations are plotted by regions in Figures 13 through 16. By plotting the Saline-Local price spreads by regions, the locations within each region can also be examined to see how their prices changed relative to each other.

FIGURE 13
NORTHWEST'S SALINE-LOCAL PRICE SPREADS
BY QUARTER FROM 1977 TO 1983

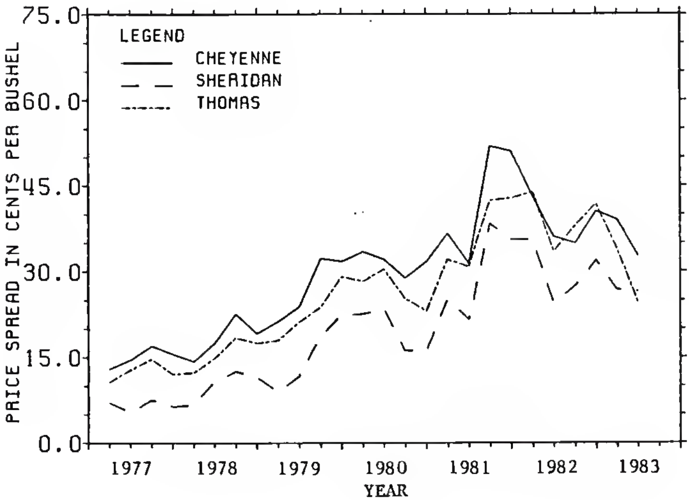
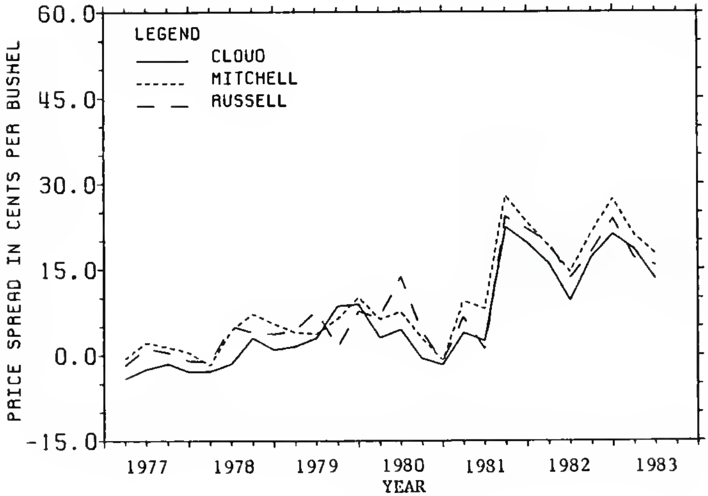


Figure 13 illustrates the Saline-Local price spread for the Northwest locations, Cheyenne, Sheridan, and Thomas. Prior to the second quarter of 1981, these locations had prices which gradually fell further and further behind the Saline price; the spreads widened about 17 cents per bushel. In the third quarter of 1981, the Saline price improved considerably relative to the Northwest locations' prices. However, over the balance of the study period, the Northwest prices gained some on the Saline price such that the Saline-Local price spreads were around first quarter-1981 levels by 1983. Regarding price relationships among the three locations, in general, Sheridan had a higher price than Thomas, which had a price greater than Cheyenne. However, in 1982, Cheyenne had a price higher than Thomas' price. Especially of interest is the price spread between Sheridan and Thomas. Sheridan had a higher price than Thomas through the first quarter of 1983, but had a slightly lower price in the second quarter of 1983. The inversion of this price spread is no doubt a result of the recently built subterminal operated at Colby, Kansas.

Figure 14 includes the price spreads between Saline and each of the Central locations, Cloud, Mitchell, and Russell. These price spreads, for the most part, increased through the second quarter of 1980 and then dropped sharply in the last half of 1980. During the first half of 1981, they increased some, but rose substantially in the third quarter of 1981. Over the rest of the study period, the Saline-Local price spread varied considerably at levels still much higher than pre-1981 levels. The prices at Cloud, Mitchell, and Russell were not different from each other by much throughout the study period. Despite this, Cloud usually had the highest price of the three locations. Mitchell and Russell varied in which location had the higher price, although Russell had the higher price more times than not.

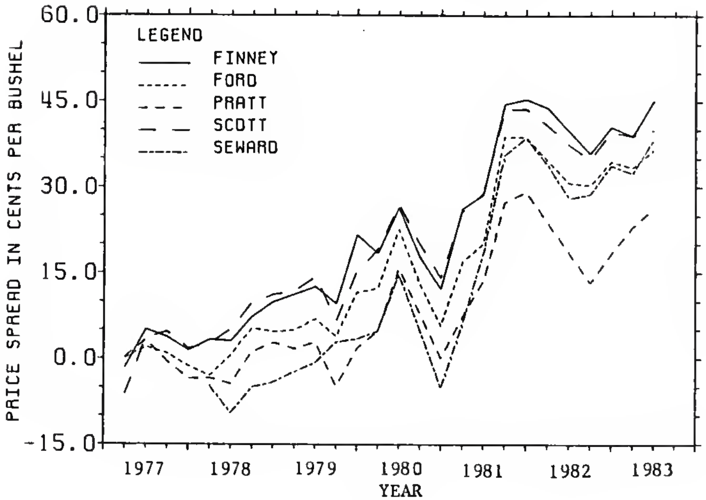
The Saline-Local price spreads for the Southwest locations are plotted in Figure 15. Similar to those spreads in the Central region, these price spreads also increased through the second quarter of 1980 and then decreased

FIGURE 14
CENTRAL'S SALINE-LOCAL PRICE SPREADS
BY QUARTER FROM 1977 TO 1983



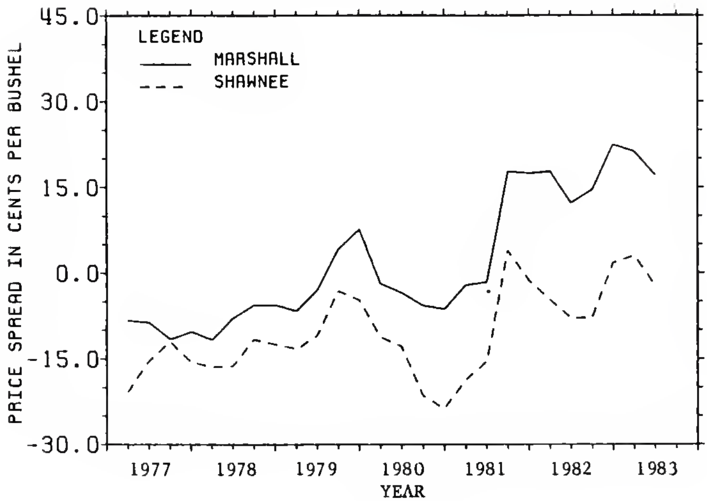
in the last half of the year. Beginning in the first quarter of 1981, the Saline-Local price spreads increased at all five Southwest locations and were still near their 1981 maximum level in the second quarter of 1983. In contrast to the Northwest and the Central regions, the Southwest region had a number of changes in geographical price relationships. Whereaa, Finney had a higher price than Scott before 1981, Scott had the higher price from 1981 through 1983. The price spreads between Seward and each of Ford, Finney, and Scott decreased considerably after early 1981. As was discussed in the previ-

FIGURE 15
SOUTHWEST'S SALINE-LOCAL PRICE SPREADS
BY QUARTER FROM 1977 TO 1983



ous section, Seward had the smallest decrease in the Gulf-Local spread and consequently, its price decreased relative to the Saline price more than the other four Southwest locations' prices. Pratt had the smallest increase in the Saline-Local price spread and therefore ended up having a price considerably greater than any of the other Southwest locations after early 1981. This is appropriate since Pratt is located farther east in Kansas and therefore should have had a lower transportation cost to the Gulf and Kansas City.

FIGURE 16
NORTHEAST'S SALINE-LOCAL PRICE SPREADS
BY QUARTER FROM 1977 TO 1983

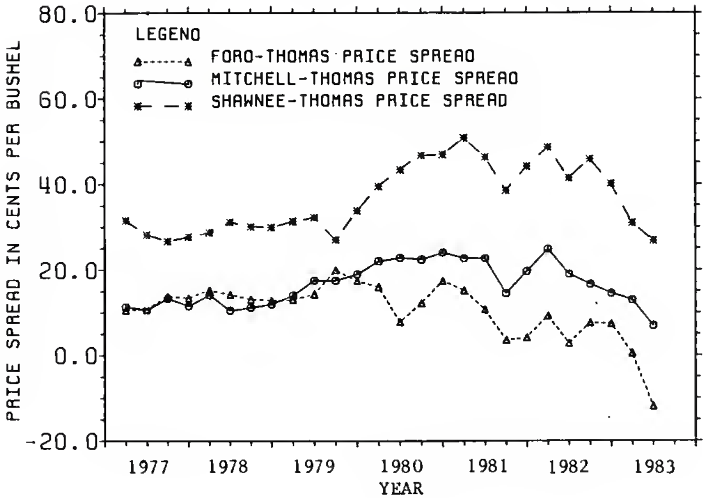


In the Northeast region of the state, the price spreads between Saline and both Shawnee and Marshall increased gradually through the end of 1979. Figure 16 shows these price spreads. Throughout 1980, these price spreads decreased substantially. They began to increase in the first half of 1981 and increased sharply in the third quarter of 1981; prior to the third quarter of 1981, these speads were mostly negative, indicating the Northeast area had prices higher than Saline. The spread between Marshall's price and Shawnee's price seems to have increased over the study period. This may have occurred because Shawnee is near a terminal and Marshall is not.

The previous discussion emphasizes how each location's price compared to Saline's price. Also, geographical relationships within each region were highlighted. A better comparison between regional price relationships is provided in Figure 17 where the price spreads between a location from each region and Thomas are illustrated; Shawnee, Mitchell, and Ford are representative of the Northeast, Central, and Southwest regions, respectively. Both Shawnee and Mitchell had prices higher than Thomas over the entire study period. On the other hand, Ford's price was less than Thomas' price, but only in 1983. The relationship between the three price spreads remained fairly constant until the first quarter of 1980. From then until the end of the study period, each spread behaved slightly differently. The Shawnee-Thomas price spread increased until the first quarter of 1981 when it began to decrease through 1983; most of the decrease, about 20 cents per bushel, came after the third quarter of 1982. The Mitchell-Thomas price spread increased slightly through the second quarter of 1981. After the first quarter of 1982, this spread declined gradually by about 17 cents per bushel. Although the Ford-Thomas price spread increased slightly until the third quarter of 1979, it generally decreased throughout the rest of the study period with the largest decrease occurring in 1983. These results show that Thomas had price increases relative to the other three locations after first quarter-1981. Furthermore, Mitchell had prices rise relative to Shawnee's price, and Ford's price increased relative to both Mitchell's and Shawnee's prices.

The results of this chapter suggest that every location in Kansas benefitted from the change in the transportation environment through lower total transportation costs. But at the same time, there was considerable variation

FIGURE 17
PRICE COMPARISON BETWEEN REGIONS
BY QUARTER FROM 1977 TO 1983



among locations in the amount of benefit received. The ability to negotiate favorable contracts with the railroads seems to be a major factor in the relative benefit received. The Saline location benefitted considerably more than any other study location presumably because of the contract rate(s) out of Salina. Another example is the apparent contract rate from the Colby subterminal in Thomas county. The limited price data indicate that relative prices at the Thomas location are increasing more than other western Kansas wheat prices since the first quarter of 1983. Hence, current geographical price relationships are still in a state of flux as compared to the more stable relationships of pre-1981.

XI. SUMMARY OF RESULTS

Transportation cost is the most significant factor in inter-market price spreads. The primary transport mode for Kansas wheat shipped from local elevators is rail. Consequently, rail rates and services were examined in this study. The rail rate structure has transformed from the relatively stable transit rate system to a combination of mileage-based gathering rates, minimum-volume or multi-car rates, and contract rates. The new rates generally provide less services to the shipper.

Before April 1981, Gulf export rates and Kansas City gathering rates increased steadily by about 62 percent (31.4 to 48.8 cents per bushel) from their early 1977 levels. The Northwest and Southwest regions had the higher rates for wheat shipments to those destinations. After April 1981, export and gathering rates declined in a irregular pattern across the locations studied. Export rates by location declined from early 1981 to early 1983 by 16.4 to 43.2 cents per bushel; the largest average absolute decrease occurred in the Northwest region and the smallest decrease was experienced by the Southwest region. Gathering rates to Kansas City over the same period declined 8.5 to 17.7 cents per bushel depending on the location; in contrast to the decline in export rates, the Southwest region had the largest average absolute decrease in its gathering rates, while the Northeast region had the smallest average absolute decrease, but the largest percentage decrease. Despite the irregular adjustment in rail rates, pre-1981 geographical relationships in transport costs were maintained throughout the study period.

Deflating rail transport costs for the fourteen study locations by the Prices Paid By Farmers Index, it was found that rail transport cost rose faster than the average price of other goods and services used by farmers for the period January 1977 to April 1981. However, after April 1981, rail transport cost declined substantially relative to the average price of other goods and services used by farmers.

Since transport cost is the major factor creating inter-market price spreads, the price spreads studied tended to follow the same trends as the rail rates just described — an increase through early 1981 and then a decrease throughout the balance of the study period. As a result of this characteristic, the residual between the price spread and the associated rail rate (total margin) was analyzed rather than the spread itself. The total margin indicates how much of the total spread is available to cover other transfer costs and provide merchants a return on services; hence, a larger total margin suggests more financial incentive to ship the wheat to that market. Both the Gulf-Local total margin and the Kansas City-Local total margin were examined for magnitude and variability. The analysis of these two margins separately indicated that certain areas of the state had prices which follow the Gulf price better than the Kansas City cash price; similarly, other areas' wheat prices followed the Kansas City cash price better than the Gulf price. Therefore, a new data series was formed for each location which consisted of the maximum total margin of each quarter for that specific location. This gave a better measurement of the total margin existing at each location for the study period. The Southwest locations had Gulf-Local total margins that exceeded the KC-Local total margins consistently at a fairly stable level around 20 cents per bushel. Non-Southwest locations had maximum total margins mostly lower than the 20 cents per bushel level. In addition, their total margins fluctuated more than the Southwest locations' margins. Since the Kansas City cash price switched from the high end of the ordinary protein basis to the bottom of the No. 1 Nominal Cash Range after 1980 (high end of ordinary protein basis averaged 6.7 cents per bushel greater than the bottom of No. 1 Nominal Cash Range from January 1981 to June 1983), there exists the possibility that the KC-Local total margins were slightly understated after 1980 because some wheat still moved East where billing could be marketed. However, the analysis on the truck discount suggests this possible understatement is minimal (less than 5 cents per bushel). The overall analysis found there was no statewide change in the maximum total margin; thus, there is no evidence that any transport savings accrued since early 1981 have been retained by country elevator or terminal merchants.

The Gulf-Kansas City cash spread was found to be more influenced by transportation cost and seasonal bidding patterns than the Gulf Basis. Normally, the Gulf Basis would parallel transportation cost from Kansas City to the Gulf, but was apparently weakened in the 1980-1981 period. The cash spread maintained its historic characteristics because the Kansas City basis also weakened over the same period for which the Gulf Basis weakened. The historic characteristics include an average transportation cost ceiling on the spread as well as a smaller, more variable Gulf-KC price spread in the fourth quarter of the crop year.

Wheat can arrive at a terminal by truck or rail for further shipment to the Gulf or other destinations. The nature of the two modes of transportation necessitate a price advantage to rail-delivered wheat, or a price disadvantage to truck-delivered wheat (truck discount). The truck discount declined substantialy over the last two years of the study period. Furthermore, the decrease in the truck discount approximated the decrease in the average rail rate to Kansas City from the fourteen locations. This observation would be expected since truck grain became more competitive with rail grain after the mileage-based gathering rail rates were instituted. Evidence also exists which suggests the truck discount gets progressively larger throughout the crop year.

The maximum total margin represents all non-transportation transfer costs. Two multiple regression models were used to try to explain the maximum total margin (weekly basis). Both models indicated that the margin decreased when more of the commercial storage was utilized. However, the two models' results disagreed on whether producers received compensation for higher protein wheat in the local elevator bid. The first model estimated that producers received 2 cents per bushel for every percentage point increase in protein content, while the second model measured no significant effect based on protein premiums. The two models also were contradictory on whether the maximum total margin was influenced by the amount of wheat used during the crop year; the first model measured no effect and the second model estimated that the margin increased when more wheat is used. Finally, this analysis found there was no more than three locations with total margins significantly different than Saline's total margin after taking account of the other effects.

Previously used methodology provided the means to test whether Kansas wheat prices were efficient from January 1977 to June 1983. Multiple regression results indicated that most study locations had maximum total margins which were a function of the price level -- a higher price meant a larger margin. This analysis also measured larger drops in the total margin after January 1, 1981 than other analyses in this study. The residuals of the multiple regressions were examined for randomness and normality. The residuals were definitely non-random but normally distributed. Based on the residuals' standard deviation, most margins did not vary more than 5 to 8 cents per bushel from their average; this amount seems reasonable considering the many market factors not accounted for in the multiple regression. Hence, it was concluded that the Kansas wheat prices were efficient for the study period.

Transport cost and other transfer costs (total margin) combine to form a price spread. Depending on the price spread components, different locations develop geographic price relationships. Subsequently, these relationships change when one or more transfer costs change dissimilarly at various locations. Regarding Kansas points relative to the Gulf, the price spreads increase consistently across all study locations through the end of 1980. From the first quarter of 1981 to the second quarter of 1983, Saline had over a 30 cent per bushel decrease in its Gulf-Local price spread. Regionally, the Northwest had the largest decrease in the Gulf-Local price spread, followed by the Central and Southwest regions; the Northeast region had only half the decrease experienced by the Central and the Southwest regions. Each region was examined individually to note any changes in geographic price relationships. The Northwest and Central regions had no apparent change in geographic relationships for those locations included in the study. In the Southwest, Scott began to have a higher price than Finney starting in the third quarter of 1981. Also beginning in 1981, the price spread between Seward and each of Finney, Ford, and Scott narrowed; the price spread between Seward and Pratt inverted in the second quarter of 1981 after which Pratt had by far the best price of all five Southwest locations. In the Northeast, Shawnee's price improved relative to Marshall's price over the study period. When comparing regions, it appeared that the price in a given region improved over the study period relative to any region farther east in the state. Also, the Northwest's prices gained on those prices at Southwest locations, on the average.

This discussion has highlighted the analysis of price spreads and their components. The Kansas wheat market's pricing performance has also been discussed.

XII. IMPLICATIONS FOR KANSAS WHEAT PRODUCERS AND GRAIN MERCHANTS

This paper has provided useful information on the behavior of some markets for Kansas wheat. Although not all market alternatives have been studied, this analysis does suggest several implications for Kansas wheat producers and grain merchants.

The wheat producer is interested primarily in the price he receives for his production. Hence, he must understand factors which determine his price relative to the general wheat price level. Marketing costs are significant determinants of the price paid to farmers. Concerning marketing costs, the findings suggest marketing costs are correlated with the price of wheat. A majority of the margins were found to be percentage-based such that as the price of wheat decreased, margins narrowed; farmers would subsequently receive a larger share of the final sale value of the wheat. Similarly, transportation costs have fallen since January 1981, a period when a weak export market has led to declining wheat prices. This characteristic is beneficial to producers since they don't incur all of a decline in the wheat price at the deficit areas. However, producers must be prepared to pay a larger marketing bill when the wheat price improves.

Perhaps a local area harvests higher quality wheat with above average protein content. The study results are inconclusive on whether producers in that area are financially rewarded for doing so. The best advice is to determine the quality of wheat produced and decide if it would pay to market it separately as a higher quality product.

Because of the decrease in the relative price disadvantage for trucked grain at terminals, producers could find it more feasible to market wheat direct from the farm to the terminal elevator. On-farm storage would be essential for this marketing strategy. A consequence of substantial direct marketing may be loss of the local elevator and the services it provides. This statement is based on the premise that grain traffic on the rail line serving the local elevator would fall and the railroad could more easily seek rail line abandonment which the Staggers Act made easier.

Insofar as the local price of wheat determines the gross return to land used for growing wheat, a change in geographic wheat price relationships infers an adjustment in land values. If the wheat price rises in one area relative to another, the land value in the first area should also increase relative to the second area's land value. Furthermore, if transportation costs decrease below expected levels, returns to the land are higher than expected (wheat price unchanged at destination) and thus, land prices should rise.

Not only has the change in the transportation environment had financial effects on Kansas wheat producers, it has also forced grain merchants at both local elevators and terminal elevators to adapt to the new operating situation. No longer can a merchant depend on a stable rail rate structure between several alternative markets. Rail rates are able to change much more rapidly since passage of the Staggers Act. Consequently, merchants must spend more resources in investigating different transportation alternatives; apparently, truck shipment has become more competitive with rail shipment to terminal elevators.

The increased usage of contracting for rail service has several implications. Contracts obviously give certain shippers a pricing advantage that can transform historic, geographical price relationships. Contracts offer the most benefit to firms with large facilities that can meet the minimum volume shipment requirements. However, the analysis of the Gulf-KC price spread suggests that a firm should not get locked in to one market -- flexibility in marketing options must be maintained. The finding that total margins were smaller and more variable in the latter part of the crop year indicates that more marketing expertise is required during this period to get the best price.

Most grain firms seek to minimize their risk exposure. Since transportation costs are more market-oriented now, forward contracting of grain without contractual arrangements for transportation service increases the risks inherent in the merchandising of grain. Management of this risk will be extremely important when the cost of rail service enters an upward trend rather than the downward trend present since early 1981.

The new transportation environment provides many opportunities for producers and grain merchants. It is hoped that this study can assist market participants in taking advantage of those opportunities.

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APPENDIX A TABLE 1. Change in the Effective Cost of Transporting Kansas Wheat to the Gulf of Mexico From Individual Locations

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
77	1	75.5	---- (----)	69.5	---- (----)	70.0	---- (----)	59.0	---- (----)	54.0	---- (----)
	2	75.5	0.0 (0.0)	69.5	0.0 (0.0)	70.0	0.0 (0.0)	59.0	0.0 (0.0)	54.0	0.0 (0.0)
	3	75.5	0.0 (0.0)	69.5	0.0 (0.0)	70.0	0.0 (0.0)	59.0	0.0 (0.0)	54.0	0.0 (0.0)
	4	77.0	1.5 (2.0)	70.8	1.3 (1.9)	71.5	1.5 (2.1)	60.2	1.2 (2.0)	55.0	1.0 (1.9)
78	1	79.5	2.5 (3.2)	73.0	2.2 (3.1)	74.0	2.5 (3.5)	62.0	1.8 (3.0)	56.5	1.5 (2.7)
	2	80.3	0.8 (1.0)	73.7	0.7 (1.0)	74.7	0.7 (1.0)	62.5	0.5 (0.8)	57.1	0.6 (1.1)
	3	83.0	2.7 (3.4)	76.0	2.3 (3.1)	77.0	2.3 (3.1)	64.0	1.5 (2.4)	59.0	1.9 (3.3)
	4	83.9	0.9 (1.1)	76.8	0.8 (1.1)	77.8	0.8 (1.0)	64.7	0.7 (1.1)	59.7	0.7 (1.2)
79	1	88.5	4.6 (5.5)	81.5	4.7 (6.1)	82.0	4.2 (5.4)	68.5	3.8 (5.9)	63.5	3.8 (6.4)

Appendix A Table 1. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	88.8	0.3 (0.3)	81.8	0.3 (0.4)	82.3	0.3 (0.4)	68.8	0.3 (0.4)	63.7	0.2 (0.3)
	3	91.7	2.9 (3.3)	84.3	2.5 (3.1)	84.8	2.5 (3.0)	71.2	2.4 (3.5)	65.7	2.0 (3.1)
	4	101.5	9.8 (10.7)	93.5	9.2 (10.9)	94.0	9.2 (10.8)	78.8	7.6 (10.7)	72.8	7.1 (10.8)
80	1	104.7	3.2 (3.2)	96.5	3.0 (3.2)	97.2	3.2 (3.4)	81.3	2.5 (3.2)	75.0	2.2 (3.0)
	2	109.8	5.1 (4.9)	100.8	4.3 (4.5)	101.3	4.1 (4.2)	85.3	4.0 (4.9)	78.3	3.3 (4.4)
	3	116.3	6.5 (5.9)	106.9	6.1 (6.1)	106.6	5.3 (5.2)	90.2	4.9 (5.7)	83.2	4.9 (6.3)
	4	117.9	1.6 (1.4)	108.4	1.5 (1.4)	108.0	1.4 (1.3)	91.4	1.2 (1.3)	84.2	1.1 (1.3)
81	1	124.3	6.4 (5.4)	114.8	6.4 (5.9)	115.3	7.3 (6.8)	96.8	5.4 (5.9)	88.8	4.5 (5.3)
	2	106.7	-17.6 (-14.2)	92.2	-22.6 (-19.7)	95.8	-19.5 (-16.9)	81.3	-15.5 (-16.0)	65.2	-23.6 (-26.6)

Appendix A Table 1. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
81	3	104.0	-2.7 (-2.5)	86.0	-6.2 (-6.7)	91.0	-4.8 (-5.0)	77.0	-4.3 (-5.3)	61.0	-4.2 (-6.4)
	4	104.0	0.0 (0.0)	86.0	0.0 (0.0)	91.0	0.0 (0.0)	77.0	0.0 (0.0)	65.5	4.5 (7.4)
82	1	94.5	-9.5 (-9.1)	86.0	0.0 (0.0)	91.0	0.0 (0.0)	75.5	-1.5 (-1.9)	61.1	-4.4 (-6.7)
	2	83.5	-11.0 (-11.6)	78.0	-8.0 (-9.3)	80.5	-10.5 (-11.5)	62.2	-13.3 (-17.6)	52.8	-8.3 (-13.6)
	3	83.5	0.0 (0.0)	78.0	0.0 (0.0)	83.0	2.5 (3.1)	64.0	1.8 (2.9)	52.5	-0.3 (-0.6)
	4	83.5	0.0 (0.0)	78.8	0.8 (1.0)	83.6	0.6 (0.7)	64.8	0.8 (1.3)	52.7	0.2 (0.4)
83	1	84.0	0.5 (0.6)	71.6	-7.2 (-9.1)	75.8	-7.8 (-9.3)	59.5	-5.3 (-8.2)	49.5	-3.2 (-6.1)
	2	84.0	0.0 (0.0)	71.6	0.0 (0.0)	75.8	0.0 (0.0)	59.5	0.0 (0.0)	49.5	0.0 (0.0)

Appendix A Table 1. (continued)

SOUTHWEST KANSAS

Year	Qtr.	Finney Rate c/bu.	Finney Rate Change c/bu. (%)	Ford Rate c/bu.	Ford Rate Change c/bu. (%)	Pratt Rate c/bu.	Pratt Rate Change c/bu. (%)	Scott Rate c/bu.	Scott Rate Change c/bu. (%)	Seward Rate c/bu.	Seward Rate Change c/bu. (%)
77	1	62.0	---- (----)	59.0	---- (----)	57.5	---- (----)	63.5	---- (----)	50.0	---- (----)
	2	62.0	0.0 (0.0)	59.0	0.0 (0.0)	57.5	0.0 (0.0)	63.5	0.0 (0.0)	50.0	0.0 (0.0)
	3	62.0	0.0 (0.0)	59.0	0.0 (0.0)	57.5	0.0 (0.0)	63.5	0.0 (0.0)	50.0	0.0 (0.0)
	4	63.2	1.2 (1.9)	60.2	1.2 (2.0)	58.7	1.2 (2.1)	64.8	1.3 (2.0)	50.8	0.8 (1.6)
78	1	65.0	1.8 (2.8)	62.0	1.8 (3.0)	60.5	1.8 (3.1)	67.0	2.2 (3.4)	52.0	1.2 (2.4)
	2	65.6	0.6 (0.9)	62.5	0.5 (0.8)	61.1	0.6 (1.0)	67.6	0.6 (0.9)	52.6	0.6 (1.2)
	3	67.5	1.9 (2.9)	64.0	1.5 (2.4)	63.0	1.9 (3.1)	69.5	1.9 (2.8)	54.5	1.9 (3.6)
	4	68.3	0.8 (1.2)	64.7	0.7 (1.1)	63.7	0.7 (1.1)	70.3	0.8 (1.2)	55.0	0.5 (0.9)
79	1	72.5	4.2 (6.1)	68.5	3.8 (5.9)	67.5	3.8 (6.0)	74.5	4.2 (6.0)	58.0	3.0 (5.5)

Appendix A Table 1. (continued)

SOUTHWEST KANSAS

		Finney		Ford		Pratt		Scott		Seward	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	72.7	0.2 (0.3)	68.8	0.3 (0.4)	67.3	0.3 (0.4)	74.8	0.3 (0.4)	58.3	0.3 (0.5)
	3	74.8	2.1 (2.9)	71.2	2.4 (3.5)	69.9	2.1 (3.1)	76.9	2.1 (2.8)	60.0	1.7 (2.9)
	4	83.2	8.4 (11.2)	78.8	7.6 (10.7)	77.3	7.4 (10.6)	85.2	8.3 (10.8)	66.9	6.9 (11.5)
80	1	85.7	2.5 (3.0)	81.3	2.5 (3.2)	79.8	2.5 (3.2)	88.0	2.8 (3.3)	69.0	2.1 (3.1)
	2	89.3	3.6 (4.2)	85.3	4.0 (4.9)	83.3	3.5 (4.4)	92.3	4.3 (4.9)	71.9	2.9 (4.2)
	3	95.0	5.7 (6.4)	90.2	4.9 (5.7)	88.6	5.3 (6.4)	97.6	5.3 (5.7)	76.2	4.3 (6.0)
	4	96.4	1.4 (1.5)	91.4	1.2 (1.3)	89.8	1.2 (1.4)	98.9	1.3 (1.3)	77.3	1.1 (1.4)
81	1	101.8	5.4 (5.6)	96.8	5.4 (5.9)	94.3	4.5 (5.0)	104.8	5.9 (6.0)	81.4	4.1 (5.3)
	2	88.3	-13.5 (-13.3)	83.0	-13.8 (-14.3)	85.5	-8.8 (-9.3)	88.8	-16.0 (-15.3)	78.5	-2.9 (-3.6)

Appendix A Table 1. (continued)

SOUTHWEST KANSAS

Year	Qtr.	Finney Rate c/bu.	Finney Rate Change c/bu. (%)	Ford Rate c/bu.	Ford Rate Change c/bu. (%)	Pratt Rate c/bu.	Pratt Rate Change c/bu. (%)	Scott Rate c/bu.	Scott Rate Change c/bu. (%)	Seward Rate c/bu.	Seward Rate Change c/bu. (%)
81	3	86.0	-2.3 (-2.6)	80.5	-2.5 (-3.0)	76.0	-9.5 (-11.1)	86.0	-2.8 (-3.2)	76.0	-2.5 (-3.2)
	4	92.5	6.5 (7.6)	86.5	6.0 (7.5)	81.5	5.5 (7.2)	92.5	6.5 (7.6)	86.5	10.5 (13.8)
82	1	87.9	-4.6 (-5.0)	81.6	-4.9 (-5.7)	72.0	-9.5 (-11.7)	88.2	-4.3 (-4.6)	84.3	-2.2 (-2.5)
	2	81.7	-6.2 (-7.1)	75.7	-5.9 (-7.2)	61.7	-10.3 (-14.3)	82.2	-6.0 (-6.8)	71.2	-13.1 (-15.5)
	3	83.5	1.8 (2.2)	77.5	1.8 (2.4)	63.5	1.8 (2.9)	84.0	1.8 (2.2)	73.5	2.3 (3.2)
	4	84.1	0.6 (0.7)	78.1	0.6 (0.8)	64.3	0.8 (1.3)	84.8	0.8 (1.0)	74.2	0.7 (1.0)
83	1	77.5	-6.6 (-7.8)	67.8	-10.3 (-13.2)	56.5	-7.8 (-12.1)	69.5	-15.3 (-18.0)	65.0	-9.2 (-12.4)
	2	77.5	0.0 (0.0)	67.8	0.0 (0.0)	56.5	0.0 (0.0)	69.5	0.0 (0.0)	65.0	0.0 (0.0)

Appendix A Table 1. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
77	1	57.5	---- (----)	59.0	---- (----)	59.5	---- (----)	54.5	---- (----)
	2	57.5	0.0 (0.0)	59.0	0.0 (0.0)	59.5	0.0 (0.0)	54.5	0.0 (0.0)
	3	57.5	0.0 (0.0)	59.0	0.0 (0.0)	59.5	0.0 (0.0)	54.5	0.0 (0.0)
	4	58.7	1.2 (2.1)	60.2	1.2 (2.0)	60.7	1.2 (2.0)	55.7	1.2 (2.2)
78	1	60.5	1.8 (3.1)	62.0	1.8 (3.0)	62.5	1.8 (3.0)	57.5	1.8 (3.2)
	2	61.1	0.6 (1.0)	62.5	0.5 (0.8)	63.1	0.6 (1.0)	58.0	0.5 (0.9)
	3	63.0	1.9 (3.1)	64.0	1.5 (2.4)	65.0	1.9 (3.0)	59.5	1.5 (2.6)
	4	63.7	0.7 (1.1)	64.7	0.7 (1.1)	65.7	0.7 (1.1)	60.2	0.7 (1.2)
79	1	67.5	3.8 (6.0)	68.5	3.8 (5.9)	69.5	3.8 (5.8)	64.0	3.8 (6.3)

Appendix A Table 1. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
79	2	67.8	0.3 (0.4)	68.8	0.3 (0.4)	69.7	0.2 (0.3)	64.3	0.3 (0.5)
	3	69.9	2.1 (3.1)	71.2	2.4 (3.5)	71.7	2.0 (2.9)	66.2	1.9 (3.0)
	4	77.3	7.4 (10.6)	78.8	7.6 (10.7)	79.3	7.6 (10.6)	73.3	7.1 (10.7)
80	1	79.8	2.5 (3.2)	81.3	2.5 (3.2)	81.8	2.5 (3.2)	75.5	2.2 (3.0)
	2	83.3	3.5 (4.4)	85.3	4.0 (4.9)	85.8	4.0 (4.9)	78.9	3.4 (4.5)
	3	88.6	5.3 (6.4)	90.2	4.9 (5.7)	90.7	4.9 (5.7)	83.7	4.8 (6.1)
	4	89.8	1.2 (1.4)	91.4	1.2 (1.3)	91.9	1.2 (1.3)	84.8	1.1 (1.3)
81	1	94.3	4.5 (5.0)	96.8	5.4 (5.9)	97.3	5.4 (5.9)	89.3	4.5 (5.3)
	2	75.5	-18.8 (-19.9)	76.0	-20.8 (-21.5)	77.8	-19.5 (-20.0)	64.7	-24.6 (-27.5)

Appendix A Table 1. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
81	3	69.9	-6.5 (-8.6)	69.0	-7.0 (-9.2)	71.0	-6.8 (-8.7)	54.0	-10.7 (-16.5)
	4	69.0	0.0 (0.0)	69.0	0.0 (0.0)	71.0	0.0 (0.0)	54.0	0.0 (0.0)
82	1	65.9	-3.1 (-4.5)	66.7	-2.3 (-3.3)	71.0	0.0 (0.0)	54.0	0.0 (0.0)
	2	62.2	-3.7 (-5.6)	64.2	-2.5 (-3.7)	68.3	-2.7 (-3.8)	54.0	0.0 (0.0)
	3	64.0	1.8 (2.9)	66.0	1.8 (2.8)	70.5	2.2 (3.2)	54.0	0.0 (0.0)
	4	64.8	0.8 (1.3)	66.0	0.0 (0.0)	71.0	0.5 (0.7)	54.0	0.0 (0.0)
83	1	59.5	-5.3 (-8.2)	59.5	-6.5 (-9.8)	64.5	-6.5 (-9.2)	48.0	-6.0 (-11.1)
	2	59.5	0.0 (0.0)	59.5	0.0 (0.0)	64.5	0.0 (0.0)	48.0	0.0 (0.0)

Appendix A TABLE 2. Change in the Effective Cost of Transporting Kansas Wheat to the Gulf of Mexico from Each Region

		REGION							
		Northeast		Central		Southwest		Northwest	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
77	1	56.5	---- (----)	57.6	---- (----)	58.4	---- (----)	71.7	---- (----)
	2	56.5	0.0 (0.0)	57.6	0.0 (0.0)	58.4	0.0 (0.0)	71.7	0.0 (0.0)
	3	56.5	0.0 (0.0)	57.6	0.0 (0.0)	58.4	0.0 (0.0)	71.7	0.0 (0.0)
	4	57.6	1.1 (1.9)	58.8	1.2 (2.1)	59.5	1.1 (1.9)	73.1	1.4 (2.0)
78	1	59.3	1.7 (3.0)	60.6	1.8 (3.1)	61.3	1.8 (3.0)	75.5	2.4 (3.3)
	2	59.8	0.5 (0.8)	61.2	0.6 (1.0)	61.9	0.6 (1.0)	76.2	0.7 (0.9)
	3	61.5	1.7 (2.8)	62.9	1.7 (2.8)	63.7	1.8 (2.9)	78.7	2.5 (3.3)
	4	62.2	0.7 (1.1)	63.6	0.7 (1.1)	64.4	0.7 (1.1)	79.5	0.8 (1.0)
79	1	66.0	3.8 (6.1)	67.4	3.8 (6.0)	68.2	3.8 (5.9)	84.0	4.5 (5.4)

Appendix A Table 2. (continued)

REGION

Year	Qtr.	Northeast Rate c/bu.	Northeast Rate Change c/bu. (%)	Central Rate c/bu.	Central Rate Change c/bu. (%)	Southwest Rate c/bu.	Southwest Rate Change c/bu. (%)	Northwest Rate c/bu.	Northwest Rate Change c/bu. (%)
79	2	66.3	0.3 (0.5)	67.7	0.3 (0.4)	68.5	0.3 (0.4)	84.3	0.3 (0.4)
	3	68.5	2.2 (3.3)	69.8	2.1 (3.1)	70.6	2.1 (3.1)	86.9	2.6 (3.1)
	4	75.8	7.3 (10.7)	77.2	7.4 (10.6)	78.3	7.7 (10.9)	96.3	9.4 (10.8)
80	1	78.2	2.4 (3.2)	79.6	2.4 (3.1)	80.8	2.5 (3.2)	99.5	3.2 (3.3)
	2	81.8	3.6 (4.6)	83.3	3.7 (4.6)	84.4	3.6 (4.5)	104.0	4.5 (4.5)
	3	86.7	4.9 (6.0)	88.3	5.0 (6.0)	89.5	5.1 (6.0)	109.9	5.9 (5.7)
	4	87.8	1.1 (1.3)	89.5	1.2 (1.4)	90.8	1.3 (1.5)	111.4	1.5 (1.4)
81	1	92.8	5.0 (5.4)	94.4	4.9 (5.5)	95.8	5.0 (5.5)	118.1	6.7 (6.0)
	2	73.3	-19.5 (-26.6)	75.5	-18.9 (-20.0)	84.8	-11.0 (-11.5)	98.2	-19.9 (-16.9)

Appendix A Table 2. (continued)

REGION

Year	Qtr.	Northeast Rate c/bu.	Northeast Rate Change c/bu. (%)	Central Rate c/bu.	Central Rate Change c/bu. (%)	Southwest Rate c/bu.	Southwest Rate Change c/bu. (%)	Northwest Rate c/bu.	Northwest Rate Change c/bu. (%)
81	3	69.0	-4.3 (-5.9)	65.8	-7.3 (-9.7)	80.9	-3.9 (-4.6)	93.7	-4.5 (-4.6)
	4	71.3	2.3 (3.3)	65.8	0.0 (0.0)	87.9	7.0 (8.0)	93.7	0.0 (0.0)
82	1	68.3	-3.0 (-4.2)	64.4	-1.4 (-2.1)	82.8	-5.1 (5.8)	90.5	-3.2 (-3.4)
	2	57.5	-10.8 (-15.8)	62.2	-1.0 (-1.6)	74.5	-8.3 (-10.0)	80.7	-9.8 (-10.8)
	3	58.3	0.8 (1.4)	63.6	1.4 (2.3)	76.4	1.9 (2.6)	81.5	0.8 (1.0)
	4	58.8	0.5 (0.9)	64.0	0.4 (0.6)	77.1	0.7 (0.9)	82.0	0.5 (0.6)
83	1	54.5	-4.3 (-7.3)	57.9	-6.1 (-9.5)	67.3	-9.8 (-12.7)	77.1	-4.9 (-1.1)
	2	54.5	0.0 (0.0)	57.9	0.0 (0.0)	67.3	0.0 (0.0)	77.1	0.0 (0.0)

Appendix A TABLE 3. Change in the Rail Rate for Transporting Kansas Wheat to Kansas City from Individual Locations

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
77	1	45.5	---- (----)	37.5	---- (----)	42.5	---- (----)	22.0	---- (----)	19.0	---- (----)
	2	45.0	0.0 (0.0)	37.5	0.0 (0.0)	42.5	0.0 (0.0)	22.0	0.0 (0.0)	19.0	0.0 (0.0)
	3	45.0	0.0 (0.0)	37.5	0.0 (0.0)	42.5	0.0 (0.0)	22.0	0.0 (0.0)	19.0	0.0 (0.0)
	4	46.0	1.0 (2.2)	38.3	0.8 (2.1)	43.3	0.8 (1.9)	22.6	0.6 (2.7)	19.4	0.4 (2.1)
78	1	47.5	1.5 (3.3)	39.5	1.2 (3.1)	44.5	1.2 (2.8)	23.5	0.9 (4.0)	20.0	0.6 (3.1)
	2	47.8	0.3 (0.6)	39.8	0.3 (0.8)	45.0	0.5 (1.1)	23.7	0.2 (0.9)	20.1	0.1 (0.5)
	3	49.0	1.2 (2.5)	41.0	1.2 (3.0)	46.5	1.5 (3.3)	24.5	0.8 (3.4)	20.5	0.4 (2.0)
	4	49.5	0.5 (1.0)	41.5	0.5 (1.2)	47.0	0.5 (1.1)	24.7	0.2 (0.8)	20.7	0.2 (1.0)
79	1	52.5	3.0 (6.1)	44.0	2.5 (6.0)	50.0	3.0 (6.4)	26.0	1.3 (5.3)	22.0	1.3 (6.3)

Appendix A Table 3. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	52.7	0.2 (0.4)	44.2	0.2 (0.5)	50.2	0.2 (0.4)	26.2	0.2 (0.8)	22.2	0.2 (0.9)
	3	54.3	1.6 (3.0)	45.4	1.2 (2.7)	51.4	1.2 (2.4)	27.0	0.8 (3.1)	23.0	0.8 (3.6)
	4	58.8	4.5 (8.3)	49.4	4.0 (8.8)	55.8	4.4 (8.6)	29.2	2.2 (8.1)	24.8	1.8 (7.8)
80	1	60.7	1.9 (3.2)	50.6	1.2 (2.4)	57.5	1.7 (3.0)	30.1	0.9 (3.1)	25.6	0.8 (3.2)
	2	63.3	2.6 (4.3)	52.8	2.2 (4.3)	59.9	2.4 (4.2)	31.4	1.3 (4.3)	26.5	0.9 (3.5)
	3	67.3	4.0 (6.3)	56.4	3.6 (6.8)	63.0	3.1 (5.2)	33.2	1.8 (5.7)	28.2	1.7 (6.4)
	4	68.3	1.0 (1.5)	57.2	0.8 (1.4)	63.8	0.8 (1.3)	33.6	0.4 (1.2)	28.5	0.3 (1.1)
81	1	72.3	4.0 (5.9)	59.9	2.7 (4.7)	67.9	4.1 (6.4)	35.4	1.8 (5.4)	29.8	1.3 (4.6)
	2	65.6	-6.7 (-9.3)	49.6	-10.3 (-17.2)	54.5	-13.4 (-19.7)	24.3	-11.1 (-31.4)	27.0	-2.8 (-9.4)

Appendix A Table 3. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
81	3	58.5	-7.1 (-10.8)	46.5	-3.1 (-6.3)	50.5	-4.0 (-7.3)	21.0	-3.3 (-13.6)	22.1	-4.9 (-18.1)
	4	62.5	4.0 (6.8)	50.0	3.5 (7.5)	54.0	3.5 (6.9)	23.0	2.0 (9.5)	21.5	-0.6 (-2.7)
82	1	65.5	3.0 (4.8)	51.2	1.2 (2.4)	56.5	2.5 (4.6)	24.7	1.7 (7.6)	22.5	1.0 (4.7)
	2	64.0	-1.5 (-2.3)	46.5	-4.7 (-9.2)	56.5	0.0 (0.0)	25.0	0.3 (1.2)	23.9	1.4 (6.2)
	3	56.0	-8.0 (-12.5)	46.5	0.0 (0.0)	56.5	0.0 (0.0)	25.0	0.0 (0.0)	19.0	-4.9 (-20.5)
	4	56.5	0.5 (0.9)	46.3	-0.2 (-0.4)	53.7	-2.8 (-5.0)	24.8	-0.2 (-0.8)	25.2	6.2 (32.6)
83	1	57.5	1.0 (1.8)	47.0	0.7 (1.5)	51.0	-2.7 (-5.0)	24.5	-0.3 (-1.2)	18.58	-6.7 (-26.6)
	2	57.5	0.0 (0.0)	47.0	0.0 (0.0)	51.0	0.0 (0.0)	24.5	0.0 (0.0)	18.5	0.0 (0.0)

Appendix A Table 3. (continued)

SOUTHWEST KANSAS

Year	Qtr.	Finney Rate c/bu.	Finney Rate Change c/bu. (%)	Ford Rate c/bu.	Ford Rate Change c/bu. (%)	Pratt Rate c/bu.	Pratt Rate Change c/bu. (%)	Scott Rate c/bu.	Scott Rate Change c/bu. (%)	Seward Rate c/bu.	Seward Rate Change c/bu. (%)
77	1	44.0	---- (----)	36.5	---- (----)	34.5	---- (----)	42.5	---- (----)	48.5	---- (----)
	2	44.0	0.0 (0.0)	36.5	0.0 (0.0)	34.5	0.0 (0.0)	42.5	0.0 (0.0)	48.5	0.0 (0.0)
	3	44.0	0.0 (0.0)	36.5	0.0 (0.0)	34.5	0.0 (0.0)	42.5	0.0 (0.0)	48.5	0.0 (0.0)
	4	44.8	0.8 (1.8)	37.1	0.6 (1.6)	35.3	0.8 (2.3)	43.3	0.8 (1.9)	49.3	0.8 (1.6)
78	1	46.0	1.2 (2.7)	38.0	0.9 (2.4)	36.5	1.2 (3.4)	44.5	1.2 (2.8)	50.5	1.2 (2.4)
	2	46.3	0.3 (0.6)	38.3	0.3 (0.8)	36.8	0.3 (0.8)	45.0	0.5 (1.1)	51.1	0.6 (1.2)
	3	47.5	1.2 (2.6)	39.5	1.2 (3.1)	38.0	1.2 (3.3)	46.5	1.5 (3.3)	53.0	1.9 (3.7)
	4	48.0	0.5 (1.1)	40.0	0.5 (1.3)	38.4	0.4 (1.1)	47.0	0.5 (1.1)	53.5	0.5 (0.9)
79	1	51.0	3.0 (6.3)	42.5	2.5 (6.3)	40.5	2.1 (5.5)	50.0	3.0 (6.4)	56.5	3.0 (5.6)

Appendix A Table 3. (continued)

SOUTHWEST KANSAS

		Finney		Ford		Pratt		Scott		Seward	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	51.2	0.2 (0.4)	42.7	0.2 (0.5)	40.7	0.2 (0.5)	50.2	0.2 (0.4)	56.7	0.2 (0.4)
	3	52.8	1.6 (3.1)	43.9	1.2 (2.8)	41.9	1.2 (2.9)	51.4	1.2 (2.4)	58.3	1.6 (2.8)
	4	57.3	4.5 (8.5)	47.5	3.6 (8.2)	45.5	3.6 (8.6)	55.8	4.4 (8.6)	63.2	4.9 (8.4)
80	1	59.0	1.7 (3.0)	48.8	1.3 (2.7)	46.8	1.3 (2.9)	57.5	1.7 (3.0)	65.0	1.8 (2.8)
	2	61.4	2.4 (4.1)	50.9	2.1 (4.3)	48.9	2.1 (4.5)	59.9	2.4 (4.2)	67.8	2.8 (4.3)
	3	65.3	3.9 (6.4)	54.0	3.1 (6.1)	51.5	2.6 (5.3)	63.4	3.5 (5.8)	71.8	4.0 (5.9)
	4	66.2	0.9 (1.4)	54.7	0.7 (1.3)	52.2	0.7 (1.4)	64.3	0.9 (1.4)	72.8	1.0 (1.4)
81	1	69.8	3.6 (5.4)	58.3	3.6 (6.6)	55.3	3.1 (5.9)	67.9	3.6 (5.6)	76.4	3.6 (4.9)
	2	63.2	-6.6 (-9.5)	51.3	-7.0 (-12.0)	46.4	-8.9 (-16.1)	57.9	-10.0 (-14.7)	68.7	-7.7 (-10.1)

Appendix A Table 3. (continued)

SOUTHWEST KANSAS

Year	Qtr.	Finney Rate c/bu.	Finney Rate Change c/bu. (%)	Ford Rate c/bu.	Ford Rate Change c/bu. (%)	Pratt Rate c/bu.	Pratt Rate Change c/bu. (%)	Scott Rate c/bu.	Scott Rate Change c/bu. (%)	Seward Rate c/bu.	Seward Rate Change c/bu. (%)
81	3	59.5	-3.7 (-5.9)	45.0	-6.3 (-12.3)	35.0	-11.4 (-24.6)	53.5	-4.4 (-7.6)	52.0	-16.7 (-24.3)
	4	53.3	-6.2 (-10.4)	44.8	-0.2 (-0.4)	35.2	0.2 (0.6)	57.0	3.5 (6.5)	56.0	4.0 (7.7)
82	1	55.0	1.7 (3.2)	50.5	5.7 (12.7)	39.5	4.3 (12.2)	59.5	2.5 (4.4)	58.5	2.5 (4.5)
	2	61.2	6.2 (11.3)	53.6	3.1 (6.1)	39.5	0.0 (0.0)	59.5	0.0 (0.0)	58.5	0.0 (0.0)
	3	71.0	9.8 (16.0)	58.5	4.9 (9.1)	39.5	0.0 (0.0)	59.5	0.0 (0.0)	58.5	0.0 (0.0)
	4	71.0	0.0 (0.0)	54.8	-3.7 (-6.3)	39.5	0.0 (0.0)	59.5	0.0 (0.0)	58.3	-0.2 (-0.3)
83	1	53.0	-18.0 (-25.4)	50.0	-4.8 (-8.6)	40.0	0.5 (1.3)	52.9	-6.6 (-11.1)	59.0	0.7 (1.2)
	2	52.1	-0.9 (-1.7)	49.8	-0.2 (-0.4)	40.0	0.0 (0.0)	52.3	-0.6 (-1.1)	59.0	0.0 (0.0)

Appendix A Table 3. (continued)

CENTRAL KANSAS

		Cloud		Mitchell		Russell		Saline	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
77	1	28.5	---- (----)	30.5	---- (----)	34.5	---- (----)	30.5	---- (----)
	2	28.5	0.0 (0.0)	30.5	0.0 (0.0)	34.5	0.0 (0.0)	30.5	0.0 (0.0)
	3	28.5	0.0 (0.0)	30.5	0.0 (0.0)	34.5	0.0 (0.0)	30.5	0.0 (0.0)
	4	29.1	1.1 (2.1)	31.1	0.6 (2.0)	35.3	0.8 (2.3)	31.1	0.6 (2.0)
78	1	30.0	0.9 (3.1)	32.0	0.9 (2.9)	36.5	1.2 (3.4)	32.0	0.9 (2.9)
	2	30.2	0.2 (0.7)	32.2	0.2 (0.6)	36.8	0.3 (0.8)	32.2	0.2 (0.6)
	3	31.0	0.8 (2.6)	33.0	0.8 (2.5)	38.0	1.2 (3.3)	33.0	0.8 (2.5)
	4	31.4	0.4 (1.3)	33.4	0.4 (1.2)	38.4	0.4 (1.1)	33.4	0.4 (1.2)
79	1	33.5	2.1 (6.7)	35.5	2.1 (6.3)	40.5	2.1 (5.5)	35.5	2.1 (6.3)

Appendix A Table 3. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
79	2	33.5	0.0 (0.0)	35.5	0.0 (0.0)	40.7	0.2 (0.5)	35.5	0.0 (0.0)
	3	34.4	0.9 (2.7)	36.4	0.9 (2.5)	41.9	1.2 (2.9)	36.4	0.9 (2.5)
	4	37.5	3.1 (9.0)	39.5	3.1 (8.5)	45.5	3.6 (8.6)	39.5	3.1 (8.5)
80	1	38.4	0.9 (2.4)	40.8	1.3 (3.3)	46.8	1.3 (2.9)	40.8	1.3 (3.3)
	2	39.9	1.5 (3.9)	42.9	2.1 (5.1)	48.9	2.1 (4.5)	42.9	2.1 (5.1)
	3	42.5	2.6 (6.5)	45.5	2.6 (6.1)	51.5	2.6 (5.3)	45.5	2.6 (6.1)
	4	43.2	0.7 (1.6)	46.1	0.6 (1.3)	52.2	0.7 (1.4)	46.1	0.6 (1.3)
81	1	45.9	2.7 (6.3)	48.4	2.3 (5.0)	55.3	3.1 (5.9)	48.4	2.3 (5.0)
	2	44.3	-1.6 (-3.5)	36.3	-12.1 (-25.0)	39.6	-15.7 (-28.4)	37.9	-10.5 (-21.7)

Appendix A Table 3. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
81	3	43.5	-0.8 (-1.8)	31.0	-5.3 (-14.6)	35.0	-4.6 (-11.6)	31.5	-6.4 (-16.9)
	4	31.0	-12.5 (-28.7)	33.5	2.5 (8.1)	38.0	3.0 (8.6)	33.5	2.0 (6.3)
82	1	32.5	1.5 (4.8)	35.0	1.5 (4.5)	39.3	1.3 (3.4)	34.0	0.5 (1.5)
	2	32.5	0.0 (0.0)	35.0	0.0 (0.0)	38.5	-0.8 (-2.0)	34.0	0.0 (0.0)
	3	32.5	0.0 (0.0)	35.0	0.0 (0.0)	38.5	0.0 (0.0)	34.0	0.0 (0.0)
	4	32.5	0.0 (0.0)	34.5	-0.5 (-1.4)	38.5	0.0 (0.0)	34.7	0.7 (2.1)
83	1	33.0	0.5 (1.5)	35.0	0.5 (1.4)	39.0	0.5 (1.3)	36.0	1.3 (3.7)
	2	33.0	0.0 (0.0)	35.0	0.0 (0.0)	39.0	0.0 (0.0)	36.0	0.0 (0.0)

Appendix A TABLE 4. Change in the Rail Rate for Transporting Kansas Wheat to Kansas City from Each Region

		REGION							
		Northeast		Central		Southwest		Northwest	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
77	1	20.5	---- (----)	31.0	---- (----)	41.2	---- (----)	41.7	---- (----)
	2	20.5	0.0 (0.0)	31.0	0.0 (0.0)	41.2	0.0 (0.0)	41.7	0.0 (0.0)
	3	20.5	0.0 (0.0)	31.0	0.0 (0.0)	41.2	0.0 (0.0)	41.7	0.0 (0.0)
	4	21.0	0.5 (2.4)	31.7	0.7 (2.1)	42.0	0.8 (1.8)	42.5	0.8 (2.1)
78	1	21.8	0.8 (3.6)	32.6	0.9 (3.1)	43.1	1.1 (2.7)	43.8	1.3 (3.1)
	2	21.9	0.1 (0.5)	32.9	0.3 (0.7)	43.5	0.4 (0.9)	44.2	0.4 (0.8)
	3	22.5	0.6 (2.7)	33.8	0.9 (2.7)	44.9	1.4 (3.2)	45.5	1.3 (2.9)
	4	22.7	0.2 (0.9)	34.2	0.4 (1.2)	45.4	0.5 (1.1)	46.0	0.5 (1.1)
79	1	24.0	1.3 (5.7)	36.3	2.1 (6.1)	48.1	2.7 (6.0)	48.8	2.8 (6.2)

Appendix A Table 4. (continued)

		REGION							
		Northeast		Northeast		Central		Northwest	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	24.2	0.2 (0.8)	36.3	0.0 (0.0)	48.3	0.2 (0.4)	49.0	0.2 (0.4)
	3	25.0	0.8 (3.3)	37.3	1.0 (2.7)	49.7	1.4 (2.8)	50.4	1.4 (2.7)
	4	27.0	2.0 (8.0)	40.5	3.2 (8.7)	53.9	4.2 (8.5)	54.7	4.3 (8.5)
80	1	27.9	0.9 (3.1)	41.7	1.2 (3.0)	55.4	1.5 (2.9)	56.3	1.6 (2.9)
	2	29.0	1.1 (4.0)	43.7	2.0 (4.7)	57.8	2.4 (4.3)	58.7	2.4 (4.3)
	3	30.7	1.7 (6.0)	46.3	2.6 (6.0)	61.2	3.4 (5.9)	62.2	3.5 (6.1)
	4	31.1	0.4 (1.1)	46.9	0.6 (1.4)	62.0	0.8 (1.4)	63.1	0.9 (1.4)
81	1	32.6	1.5 (5.0)	49.5	2.6 (5.5)	65.5	3.5 (5.6)	66.7	3.6 (5.7)
	2	25.7	-6.9 (-21.3)	39.5	-10.0 (-20.2)	57.5	-8.0 (-12.3)	56.6	-10.1 (-15.2)

Appendix A Table 4. (continued)

REGION

Year	Qtr.	Northeast Rate c/bu.	Northeast Rate Change c/bu. (%)	Central Rate c/bu.	Central Rate Change c/bu. (%)	Southwest Rate c/bu.	Southwest Rate Change c/bu. (%)	Northwest Rate c/bu.	Northwest Rate Change c/bu. (%)
81	3	21.6	-4.1 (-16.0)	35.3	-4.2 (-10.8)	49.0	-8.5 (-14.8)	51.8	-4.8 (-8.4)
	4	22.3	0.7 (3.2)	34.0	-1.3 (-3.5)	49.3	0.3 (0.5)	55.5	3.7 (7.1)
82	1	23.6	1.3 (6.1)	35.2	1.2 (3.5)	52.6	3.3 (6.8)	57.7	2.2 (4.0)
	2	24.5	0.9 (3.6)	35.0	-0.2 (-0.6)	54.5	1.9 (3.5)	55.7	-2.0 (-3.6)
	3	22.0	-2.5 (-10.0)	35.0	0.0 (0.0)	57.4	2.9 (5.4)	53.0	-2.7 (-4.8)
	4	25.0	3.0 (13.6)	35.1	0.1 (0.1)	56.6	-0.8 (-1.4)	52.2	-0.8 (-1.6)
83	1	21.5	-3.5 (-14.0)	35.8	0.7 (2.0)	51.0	-5.6 (-10.0)	51.8	-0.3 (-0.6)
	2	21.5	0.0 (0.0)	35.8	0.0 (0.0)	50.6	-0.3 (-0.7)	51.8	0.0 (0.0)

APPENDIX B TABLE 1. Quarterly Averages of the Nominal Gulf-Local Wheat Price Spread - January 1977 to June 1983.

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
77	1	86.0	----- (-----)	80.0	----- (-----)	83.7	----- (-----)	64.7	----- (-----)	52.2	----- (-----)
	2	82.9	-3.1 (-3.6)	73.7	-6.3 (-7.9)	81.1	-2.6 (-3.1)	59.6	-5.1 (-7.9)	52.9	0.7 (1.3)
	3	86.9	4.0 (4.8)	77.4	3.7 (5.0)	84.6	3.5 (4.3)	58.3	-1.3 (-2.2)	57.9	5.0 (9.5)
	4	88.1	1.2 (1.4)	78.9	1.5 (1.9)	84.6	0.0 (0.0)	62.2	3.9 (6.7)	56.9	-1.0 (-1.7)
78	1	92.2	4.1 (4.7)	84.6	5.7 (7.2)	90.2	5.6 (6.6)	66.2	4.0 (6.4)	61.5	40.6 (8.1)
	2	98.8	6.6 (7.2)	92.0	7.4 (8.7)	96.1	5.9 (6.5)	73.4	7.2 (10.9)	65.0	3.5 (5.7)
	3	96.7	-2.1 (-2.1)	86.6	-5.4 (-5.9)	92.5	-3.6 (-3.7)	68.5	-4.9 (-6.7)	62.4	-2.6 (-4.0)
	4	93.1	-3.6 (-3.7)	85.4	-1.2 (-1.4)	91.4	-1.1 (-1.2)	68.3	-0.2 (-0.3)	61.4	-1.0 (-1.0)
79	1	103.2	10.1 (10.8)	90.9	5.5 (6.4)	99.9	8.5 (9.3)	75.2	6.9 (10.1)	68.6	7.2 (11.7)

Appendix B Table 1. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	102.4	-0.8 (-0.8)	90.2	-0.7 (-0.8)	99.7	-0.2 (-0.2)	75.5	0.3 (0.4)	67.5	-1.1 (-1.6)
	3	122.5	20.1 (19.6)	108.9	18.7 (20.7)	114.0	14.3 (14.3)	94.4	18.9 (25.0)	87.0	19.5 (28.9)
	4	124.4	1.9 (1.6)	115.0	6.1 (5.6)	121.7	7.7 (6.8)	100.2	5.8 (6.1)	87.9	0.9 (1.0)
80	1	124.4	0.0 (0.0)	113.5	-1.5 (-1.3)	119.2	-2.5 (-2.1)	89.0	-11.2 (-11.2)	79.7	-8.2 (-9.3)
	2	111.2	-13.2 (-10.6)	102.6	-10.9 (-9.6)	109.5	-9.7 (-8.1)	75.6	-13.4 (-15.1)	66.2	-13.5 (-16.9)
	3	123.8	12.6 (11.3)	111.1	8.5 (8.3)	120.2	10.7 (9.8)	89.2	13.6 (18.0)	73.5	7.3 (11.0)
	4	133.9	10.1 (8.2)	118.3	7.2 (6.5)	125.3	5.1 (4.2)	95.9	6.7 (7.5)	78.4	4.9 (6.7)
81	1	132.9	-1.0 (-0.7)	121.4	3.1 (2.6)	128.4	3.1 (2.5)	94.2	-1.7 (-1.8)	77.6	-0.8 (-1.0)
	2	113.7	-19.2 (-14.4)	103.9	-17.5 (-14.4)	113.1	-15.3 (-11.9)	80.7	-13.5 (-14.3)	66.8	-10.8 (-13.9)

Appendix B Table 1. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
81	3	117.1	3.4 (3.0)	103.5	-0.4 (-0.4)	107.6	-5.5 (-4.9)	82.9	2.2 (2.7)	69.1	2.3 (3.4)
	4	113.9	-3.2 (-2.7)	98.5	-5.0 (-4.8)	105.7	-1.9 (-1.8)	80.3	-2.6 (-3.1)	61.6	-7.5 (-10.9)
82	1	108.1	-5.8 (-5.1)	100.5	2.0 (2.0)	108.9	3.2 (3.0)	82.8	2.5 (3.1)	60.3	-1.3 (-2.1)
	2	100.4	-7.7 (-7.1)	88.9	-11.6 (-11.5)	97.9	-11.0 (-10.1)	76.6	-6.2 (-7.5)	56.5	-3.8 (-6.3)
	3	101.3	0.9 (0.9)	93.8	4.9 (5.5)	104.3	6.4 (6.5)	80.9	4.3 (5.6)	58.5	2.0 (3.5)
	4	98.9	-2.4 (-2.4)	90.3	-3.5 (-3.7)	100.2	-4.1 (-3.9)	80.8	-0.1 (-0.1)	60.1	1.6 (2.7)
83	1	103.0	4.1 (4.1)	90.8	0.5 (0.6)	97.9	-2.3 (-2.3)	85.2	4.4 (5.4)	67.0	6.9 (11.5)
	2	84.2	-18.8 (-18.3)	78.0	-12.8 (-14.1)	76.1	-21.8 (-22.3)	68.6	-16.6 (-19.5)	49.3	-17.7 (-26.4)

Appendix B Table 1. (continued)

SOUTHWEST KANSAS

		Finney		Ford		Pratt		Scott		Seward	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
77	1	71.4	----- (-----)	73.1	----- (-----)	73.3	----- (-----)	66.8	----- (-----)	----	----- (-----)
	2	73.4	2.0 (2.8)	70.3	-2.8 (-3.8)	71.5	-1.8 (-2.5)	71.8	5.0 (7.5)	----	----- (-----)
	3	73.6	0.2 (2.7)	70.8	0.5 (0.7)	69.4	-2.1 (-2.9)	74.6	2.8 (3.9)	----	----- (-----)
	4	74.0	0.4 (0.5)	71.2	0.4 (0.6)	69.0	-0.4 (-0.6)	74.3	-0.3 (-0.4)	----	----- (-----)
78	1	81.2	7.2 (9.7)	74.9	3.7 (5.2)	74.5	5.5 (8.0)	80.6	6.3 (8.5)	73.2	---- (-----)
	2	84.4	3.2 (3.9)	81.9	7.0 (9.3)	76.9	2.4 (3.2)	86.4	5.8 (7.2)	71.8	-1.4 (-1.9)
	3	81.5	-2.9 (-3.4)	79.4	-2.5 (-3.1)	75.3	-1.6 (-2.1)	83.8	-2.6 (-3.0)	69.1	-2.7 (-3.8)
	4	83.8	2.3 (2.8)	78.6	-0.8 (-1.0)	76.7	1.4 (1.9)	85.1	1.3 (1.6)	69.8	0.7 (1.0)
79	1	93.2	9.4 (11.2)	86.9	8.3 (10.6)	83.6	6.9 (9.0)	93.7	8.6 (10.1)	79.6	9.8 (14.0)

Appendix B Table 1. (continued)

SOUTHWEST KANSAS

		Finney		Ford		Pratt		Scott		Seward	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	91.1	-2.1 (-2.3)	85.4	-1.5 (-1.7)	81.4	-2.2 (-2.6)	92.8	-0.9 (-1.0)	77.8	-1.8 (-2.3)
	3	99.8	8.7 (9.5)	94.1	8.7 (10.2)	85.3	3.9 (4.8)	97.0	4.2 (4.5)	93.1	15.3 (19.7)
	4	114.2	14.4 (14.4)	104.2	10.1 (10.7)	94.4	9.1 (10.7)	107.8	10.8 (11.1)	96.1	3.0 (3.2)
80	1	109.4	-4.8 (-4.2)	103.2	-1.0 (-1.0)	95.7	1.3 (1.4)	109.9	2.1 (1.9)	95.7	-0.4 (-0.4)
	2	105.5	-3.9 (-3.6)	101.7	-1.5 (-1.5)	94.9	-0.8 (-0.8)	106.1	-3.8 (-3.5)	93.8	-1.9 (-2.0)
	3	112.6	7.1 (6.7)	108.0	6.3 (6.2)	102.7	7.8 (8.2)	115.0	8.9 (8.4)	99.8	6.0 (6.4)
	4	114.4	1.8 (1.6)	107.9	-0.1 (-0.1)	102.3	-0.4 (-0.4)	116.3	1.3 (1.1)	97.1	-2.7 (-2.7)
81	1	122.5	8.1 (7.1)	113.2	5.3 (4.9)	103.5	1.2 (1.2)	122.0	5.7 (4.9)	102.2	5.1 (5.3)
	2	111.0	-11.5 (-9.4)	102.4	-10.8 (-9.5)	95.8	-7.7 (-7.4)	111.2	-10.8 (-8.9)	100.8	-1.4 (-1.4)

Appendix B Table 1. (continued)

SOUTHWEST KANSAS

Year	Qtr.	Finney Rate c/bu.	Finney Rate Change c/bu. (%)	Ford Rate c/bu.	Ford Rate Change c/bu. (%)	Pratt Rate c/bu.	Pratt Rate Change c/bu. (%)	Scott Rate c/bu.	Scott Rate Change c/bu. (%)	Seward Rate c/bu.	Seward Rate Change c/bu. (%)
81	3	109.8	-1.2 (-1.1)	104.0	1.6 (1.6)	92.5	-3.3 (-3.4)	108.8	-2.4 (-2.2)	100.8	0.0 (0.0)
	4	108.3	-1.5 (-1.4)	101.6	-2.4 (-2.3)	92.1	-0.4 (-0.4)	106.6	-2.2 (-2.0)	101.5	0.7 (0.7)
82	1	108.9	0.6 (0.6)	99.7	-1.9 (-1.9)	88.9	-3.2 (-3.5)	105.8	-0.8 (-0.8)	98.9	-2.6 (-2.6)
	2	104.2	-4.7 (-4.3)	95.1	-4.6 (-4.6)	82.9	-6.0 (-6.7)	101.8	-4.0 (-3.9)	92.5	-6.4 (-6.5)
	3	102.3	-1.9 (-1.8)	96.7	1.6 (1.7)	79.7	-3.2 (-3.9)	101.3	-0.5 (-0.5)	95.2	2.7 (2.9)
	4	98.9	-3.4 (-3.3)	92.9	-3.8 (-3.9)	76.8	-2.9 (-3.6)	98.0	-3.3 (-3.3)	92.2	-3.0 (-3.2)
83	1	102.9	4.0 (4.0)	97.4	4.5 (4.8)	87.0	10.2 (13.3)	103.0	5.0 (5.1)	96.4	4.2 (4.6)
	2	96.6	-6.3 (-6.1)	88.0	-9.4 (-9.7)	77.8	-9.2 (-10.6)	91.5	-11.5 (-11.2)	89.8	-6.6 (-6.8)

Appendix B Table 1. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
77	1	68.9	---- (----)	72.4	---- (----)	71.3	---- (----)	73.0	---- (----)
	2	65.9	-3.0 (-4.4)	70.5	-1.9 (-2.6)	69.5	-1.8 (-2.5)	68.3	-4.7 (-6.4)
	3	68.4	2.5 (3.8)	71.3	0.8 (1.1)	70.4	0.9 (1.3)	69.9	1.6 (2.3)
	4	69.6	1.2 (1.8)	73.0	1.7 (2.4)	71.5	1.1 (1.6)	72.5	2.6 (3.7)
78	1	75.1	5.5 (7.9)	76.1	3.1 (4.2)	76.8	5.3 (7.4)	77.9	5.4 (7.4)
	2	79.8	4.7 (6.3)	85.6	9.5 (12.5)	86.3	9.5 (12.4)	81.3	3.4 (4.4)
	3	77.1	-2.7 (-3.4)	81.3	-4.3 (-5.0)	78.1	-8.2 (-9.5)	74.1	-7.2 (-8.9)
	4	74.9	-2.2 (-2.9)	79.4	-1.9 (-2.3)	77.6	-0.5 (-0.6)	73.9	-0.2 (-0.3)
79	1	83.5	8.6 (11.5)	85.9	6.5 (8.2)	86.3	8.7 (11.2)	81.9	8.0 (10.8)

Appendix B Table 1. (continued)

CENTRAL KANSAS

		Cloud		Mitchell		Russell		Saline	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	81.5	-2.0 (-2.4)	82.2	-3.7 (-4.3)	86.2	-0.1 (-0.1)	78.5	-3.4 (-4.2)
	3	98.8	17.3 (21.2)	96.5	14.3 (17.4)	91.6	5.4 (6.3)	90.2	11.7 (14.9)
	4	101.5	2.7 (2.7)	102.7	6.2 (6.4)	100.3	8.7 (9.5)	92.6	2.4 (2.7)
80	1	94.0	-7.5 (-7.4)	97.2	-5.5 (-5.4)	97.3	-3.0 (-3.0)	90.9	-1.7 (-1.8)
	2	83.6	-10.4 (-11.1)	86.7	-10.5 (-10.8)	92.8	-4.5 (-4.6)	79.1	-11.8 (-13.0)
	3	94.3	10.7 (12.8)	97.8	11.1 (12.8)	99.0	6.2 (6.7)	94.9	15.8 (20.0)
	4	100.5	6.2 (6.6)	101.3	3.5 (3.6)	101.1	2.1 (2.1)	102.2	7.3 (7.7)
81	1	100.2	-0.3 (-0.3)	105.7	4.4 (4.3)	102.9	1.8 (1.8)	96.3	-5.9 (-5.8)
	2	84.8	-15.4 (-15.4)	90.4	-15.3 (-14.5)	83.4	-19.5 (-19.0)	82.3	-14.0 (-14.5)

Appendix B Table 1. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
81	3	87.5	2.7 (3.2)	93.1	2.7 (3.0)	89.4	6.0 (7.2)	65.2	-17.1 (-20.8)
	4	82.5	-5.0 (-5.7)	86.1	-7.0 (-7.5)	84.9	-4.5 (-5.0)	62.9	-2.3 (-3.5)
82	1	81.0	-1.5 (-1.8)	84.1	-2.0 (-2.3)	84.6	-0.3 (-0.4)	65.0	2.1 (3.3)
	2	73.9	-7.1 (-8.8)	78.9	-5.2 (-6.2)	77.9	-6.7 (-7.9)	64.4	-0.6 (-0.9)
	3	83.5	9.6 (13.0)	87.7	8.8 (11.2)	84.4	6.5 (8.3)	66.4	2.0 (3.1)
	4	79.5	-4.0 (-4.8)	85.7	-2.0 (-2.3)	82.2	-2.2 (-2.6)	58.4	-8.0 (-12.0)
83	1	82.5	3.0 (3.8)	85.0	-0.7 (-0.8)	81.0	-1.2 (-1.5)	64.0	5.6 (9.6)
	2	64.8	-17.7 (-21.5)	69.2	-15.8 (-18.6)	67.2	-13.8 (-17.0)	51.5	-12.5 (-19.5)

Appendix B TABLE 2. Quarterly Mean and Standard Deviation of the Gulf-Local Total Margin - January 1977 to June 1983.

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.
77	1	10.5	3.3	10.5	3.4	13.7	2.0	5.7	3.0	-1.8	2.6
	2	7.4	3.2	4.2	4.2	11.1	2.9	0.6	3.2	-1.1	3.5
	3	11.4	1.3	7.9	1.9	14.6	0.8	-0.7	3.7	3.9	1.0
	4	11.1	3.7	8.0	4.2	13.1	4.9	2.0	4.8	2.0	4.1
78	1	12.7	6.1	11.6	7.5	16.2	8.0	4.2	7.5	5.0	6.8
	2	18.5	6.2	18.3	5.8	21.4	5.6	10.9	4.3	7.9	5.6
	3	13.7	2.1	10.6	1.4	15.5	1.5	4.5	1.7	3.4	1.5
	4	9.2	5.3	8.6	2.6	13.6	2.5	3.6	1.6	1.8	2.8
79	1	14.7	3.1	9.4	2.9	17.9	3.7	6.7	4.0	5.1	4.0
	2	13.6	6.5	8.4	4.2	17.4	3.0	6.7	4.2	3.8	4.8
	3	30.8	3.3	24.6	4.0	29.2	4.6	23.3	4.7	21.3	3.9
	4	22.9	7.0	21.4	6.4	27.6	4.4	21.4	3.5	15.0	8.8
80	1	19.6	5.9	16.9	5.2	21.8	4.9	7.5	5.3	4.7	6.0

Appendix B Table 2. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.
80	2	1.5	5.6	1.8	6.5	8.1	5.6	-9.7	5.8	-12.1	6.2
	3	7.4	5.2	4.2	5.2	13.7	4.8	-0.9	4.8	-9.7	4.4
	4	16.0	4.3	9.9	4.1	17.4	3.2	4.5	4.8	-5.9	4.0
81	1	8.6	7.5	6.6	6.6	13.1	8.8	-2.7	6.0	-11.2	5.3
	2	6.9	8.2	11.8	10.8	17.4	9.5	-0.6	8.2	1.6	10.3
	3	13.1	8.4	17.5	6.4	16.6	8.0	5.9	7.9	8.1	5.6
	4	9.9	5.2	12.5	4.9	14.7	5.6	3.3	4.9	-3.9	5.6
82	1	13.6	6.4	14.5	4.9	17.9	5.4	7.3	2.8	-0.8	8.4
	2	16.9	11.4	10.9	7.8	17.3	8.2	14.5	10.8	3.7	8.3
	3	17.8	5.3	15.8	3.8	21.3	3.2	16.9	4.8	6.0	2.9
	4	15.4	3.3	11.5	2.5	16.7	3.8	16.0	4.2	7.4	4.7
83	1	19.0	5.4	19.2	3.8	22.1	5.5	25.7	5.4	17.5	6.3
	2	0.2	7.9	6.4	7.5	0.3	8.3	9.1	7.3	-0.2	8.3

Appendix B Table 2. (continued)

SOUTHWEST KANSAS

		Finney		Ford		Pratt		Scott		Seward	
Year	Qtr.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.
77	1	9.4	2.2	14.1	1.7	15.8	1.4	3.3	3.3	----	----
	2	11.4	1.3	11.3	2.0	14.0	3.9	8.3	2.5	----	----
	3	11.6	0.5	11.8	1.1	11.9	0.7	11.1	2.0	----	----
	4	10.9	4.0	11.0	3.2	10.4	4.6	9.5	4.1	----	----
78	1	16.2	7.4	12.9	5.4	14.0	5.5	13.6	7.4	21.2	6.2
	2	18.8	5.3	19.4	4.0	15.8	4.0	18.9	4.8	19.2	7.7
	3	14.0	0.7	15.4	1.1	12.3	0.6	14.3	1.2	14.6	1.4
	4	15.5	2.8	13.9	1.8	13.0	1.6	14.8	2.2	14.8	2.7
79	1	20.7	3.9	18.4	2.4	16.1	3.0	19.2	3.1	21.6	2.6
	2	18.4	2.8	16.6	2.4	13.6	2.4	18.0	2.2	19.5	2.7
	3	25.0	5.5	22.9	2.1	15.4	1.9	20.1	4.1	33.1	4.9
	4	31.0	4.2	25.4	2.2	17.0	3.0	22.6	4.7	29.2	6.4
80	1	23.7	4.9	21.7	4.1	15.7	4.1	21.8	4.0	26.7	4.3

Appendix B Table 2. (continued)

SOUTHWEST KANSAS

		Finney		Ford		Pratt		Scott		Seward	
Year	Qtr.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.
80	2	16.1	3.7	16.4	4.3	11.6	3.1	13.8	3.8	21.9	2.6
	3	17.6	2.7	17.9	2.5	14.1	2.7	17.4	2.7	23.5	2.3
	4	18.0	3.2	16.5	4.1	12.5	3.4	17.4	2.6	19.8	3.8
81	1	20.7	1.6	16.4	3.6	9.2	4.6	17.2	1.6	20.8	3.5
	2	22.6	5.0	19.4	5.1	10.3	6.5	22.4	6.1	22.3	2.3
	3	23.8	3.1	23.5	3.1	16.5	4.4	22.8	3.8	24.8	2.2
	4	15.8	3.0	15.1	2.5	10.6	3.8	14.1	2.9	15.0	3.0
82	1	21.0	2.9	18.1	4.0	16.8	7.1	17.6	3.6	14.5	6.3
	2	22.5	1.8	19.4	1.9	21.3	4.5	19.6	2.6	21.3	1.8
	3	18.8	3.3	19.2	3.1	16.2	3.3	17.3	2.3	21.7	4.8
	4	14.8	4.6	14.9	2.5	12.5	2.5	13.2	3.3	17.9	2.9
83	1	25.4	4.7	29.6	4.5	30.5	3.7	33.4	4.5	31.4	2.1
	2	19.1	4.6	20.2	4.7	21.3	4.5	22.0	6.2	24.8	5.3

Appendix B Table 2. (continued)

CENTRAL KANSAS

		Cloud		Mitchell		Russell		Saline	
Year	Qtr.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.
77	1	11.4	2.8	13.4	2.6	11.8	2.2	18.5	3.4
	2	8.4	2.4	11.5	2.9	10.0	2.6	13.8	3.1
	3	10.9	1.4	12.3	1.2	10.9	0.8	15.4	1.0
	4	10.9	4.1	12.9	3.1	10.8	4.0	16.8	4.1
78	1	14.6	6.9	14.1	8.7	14.3	7.8	20.4	5.9
	2	18.7	4.2	23.1	5.3	23.2	5.0	23.3	6.2
	3	14.1	1.4	17.3	0.9	13.1	2.1	14.6	1.8
	4	11.2	1.7	14.7	1.5	11.9	1.0	13.7	1.3
79	1	16.0	3.8	17.4	2.4	16.8	2.9	17.9	5.2
	2	13.7	4.8	13.4	3.8	16.5	3.3	14.2	4.9
	3	28.9	2.8	25.3	3.6	19.9	2.3	24.0	2.2
	4	24.2	6.2	23.9	6.2	21.0	4.6	19.2	7.8
80	1	14.1	4.7	15.7	4.7	15.3	5.1	15.3	5.1

Appendix B Table 2. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Margin c/bu.	Cloud Std. Dev. c/bu.	Mitchell Margin c/bu.	Mitchell Std. Dev. c/bu.	Russell Margin c/bu.	Russell Std. Dev. c/bu.	Saline Margin c/bu.	Saline Std. Dev. c/bu.
80	2	0.3	5.3	1.4	5.4	6.9	5.4	0.2	6.2
	3	5.7	3.6	7.6	4.5	8.4	3.3	11.2	4.6
	4	10.8	3.9	9.9	4.5	9.3	4.7	17.4	7.0
81	1	5.9	6.1	8.9	5.9	5.5	6.0	7.0	12.4
	2	9.2	10.5	14.3	10.7	5.6	7.6	17.6	12.6
	3	18.5	5.9	24.1	6.1	18.4	6.6	11.2	7.1
	4	13.5	5.3	17.1	4.7	13.9	3.9	8.9	6.2
82	1	15.1	4.8	17.4	2.1	13.6	3.5	11.0	3.5
	2	11.7	6.0	14.8	6.3	9.5	6.9	10.4	6.0
	3	19.5	4.3	21.7	4.0	13.9	5.5	12.4	4.9
	4	14.8	3.0	19.7	3.5	11.1	5.9	4.4	4.2
83	1	23.0	6.9	25.5	7.4	16.5	9.3	16.0	6.7
	2	5.3	5.7	9.7	6.2	2.7	7.1	3.5	4.5

APPENDIX B TABLE 3. ANOVA Table for the Mean Gulf-Local Total Margin

ANALYSIS OF VARIANCE PROCEDURE

DEPENDENT VARIABLE: TOTMGMN

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	45	12249.45660119	272.21014669	20.89
ERROR	234	3049.39425595	13.03159938	PR > F
CORRECTED TOTAL	279	15298.85085714		0.0001

R-SQUARE	C.V.	ROOT MSE	TOTMGMN MEAN
0.800678	23.9612	3.60993066	15.06571429

SOURCE	DF	ANOVA SS	F VALUE	PR > F
TIME	1	20.74814881	1.59	0.2083
QT(TIME)	18	6162.23699405	26.27	0.0001
LCC	13	5489.35185714	32.40	0.0001
LCC*TIME	13	577.11960119	3.41	0.0001

TESTS OF HYPOTHESES USING THE ANOVA MS FOR QT(TIME) AS AN ERROR TERM

SOURCE	DF	ANOVA SS	F VALUE	PR > F
TIME	1	20.74814881	0.06	0.8083

APPENDIX B TABLE 4. ANOVA Table for the Gulf-Local Total Margin Variability

ANALYSIS OF VARIANCE PROCEDURE

DEPENDENT VARIABLE: TOTMGSD

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	45	689.71521429	15.32700476	10.97
ERROR	234	326.94875000	1.39721688	PR > F
CORRECTED TOTAL	279	1016.66396429		0.0001

R-SQUARE	C.V.	ROOT MSE	TOTMGSD MEAN
0.678410	26.3575	1.18203929	4.48464286

SOURCE	DF	ANOVA SS	F VALUE	PR > F
TIME	1	50.96116667	36.47	0.0001
QT(TIME)	18	434.17208333	17.26	0.0001
LOC	13	163.94546429	9.03	0.0001
LOC*TIME	13	40.63650000	2.24	0.0090

TESTS OF HYPOTHESES USING THE ANOVA MS FOR QT(TIME) AS AN ERROR TERM

SOURCE	DF	ANOVA SS	F VALUE	PR > F
TIME	1	50.96116667	2.11	0.1633

APPENDIX B TABLE 5. ANOVA Table for Test of Seasonality in the Mean and the Variability of the Gulf-Local Total Margin

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: TOTMGMN

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	55	8256.64400000	150.12080000	3.91
ERROR	224	8599.10800000	38.38887500	PR > F
CORRECTED TOTAL	279	16855.75200000		0.0001

R-SQUARE	C.V.	ROOT MSE	TOTMGMN MEAN
0.489841	42.5541	6.19587564	14.56000000

SOURCE	DF	TYPE I SS	F VALUE	PR > F
LOC	13	6613.52700000	13.25	0.0001
CYQTR	3	975.20571429	8.47	0.0001
LOC*CYQTR	39	667.91128571	0.45	0.9982

SOURCE	DF	TYPE III SS	F VALUE	PR > F
LOC	13	6613.52700000	13.25	0.0001
CYQTR	3	975.20571429	8.47	0.0001
LOC*CYQTR	39	667.91128571	0.45	0.9982

GENERAL LINEAR MODELS PROCEDURE

LEAST SQUARES MEANS

CYQTR	TOTMGMN LSMEAN	STD ERR LSMEAN	PROB > |T| HO:LSMEAN=0	LSMEAN NUMBER
1	16.3228571	0.7405488	0.0001	1
2	14.3771429	0.7405488	0.0001	2
3	15.9542857	0.7405488	0.0001	3
4	11.5857143	0.7405488	0.0001	4

PROB > |T| HO: LSMEAN(I)=LSMEAN(J)

I/J	1	2	3	4
1	.	0.0645	0.7252	0.0001
2	0.0645	.	0.1335	0.0083
3	0.7252	0.1335	.	0.0001
4	0.0001	0.0083	0.0001	.

APPENDIX B TABLE 5. (continued)

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: TOTMGSO

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	55	533.03225000	9.69149545	2.80
ERROR	224	774.34400000	3.45689286	PR > F
CORRECTED TOTAL	279	1307.37625000		0.0001

R-SQUARE	C.V.	ROOT MSE	TOTMGSO MEAN
0.407711	40.7512	1.85927213	4.56250000

SOURCE	DF	TYPE I SS	F VALUE	PR > F
LOC	13	250.33275000	5.57	0.0001
CYQTR	3	196.73925000	18.97	0.0001
LOC*CYQTR	39	85.96025000	0.64	0.9532

SOURCE	DF	TYPE III SS	F VALUE	PR > F
LOC	13	250.33275000	5.57	0.0001
CYQTR	3	196.73925000	18.97	0.0001
LOC*CYQTR	39	85.96025000	0.64	0.9532

GENERAL LINEAR MODELS PROCEDURE

LEAST SQUARES MEANS

CYQTR	TOTMGSO LSMEAN	STD ERR LSMEAN	PROB > |T| HO:LSMEAN=0	LSMEAN NUMBER
1	3.66714286	0.22222552	0.0001	1
2	3.95428571	0.22222552	0.0001	2
3	4.81000000	0.22222552	0.0001	3
4	5.81857143	0.22222552	0.0001	4

PROB > |T| HO: LSMEAN(I)=LSMEAN(J)

I/J	1	2	3	4
1	.	0.3619	0.0003	0.0001
2	0.3619	.	0.0070	0.0001
3	0.0003	0.0070	.	0.0015
4	0.0001	0.0001	0.0015	.

Appendix B TABLE 6. Quarterly Averages of the Nominal Kansas City-Local Wheat Price Spread - January 1977 to June 1983.

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
77	1	60.0	----- (-----)	53.9	----- (-----)	57.7	----- (-----)	38.7	----- (-----)	26.1	----- (-----)
	2	60.2	0.2 (0.3)	51.0	-2.9 (-5.4)	58.4	0.7 (1.2)	36.9	-1.8 (-4.7)	30.2	4.1 (15.7)
	3	59.5	-0.7 (-1.2)	50.0	-1.0 (-2.0)	57.2	-1.2 (-2.1)	30.9	-6.0 (-16.3)	30.5	0.3 (1.0)
	4	61.5	2.0 (3.4)	52.2	2.2 (4.4)	58.0	0.8 (1.4)	35.6	4.7 (15.2)	30.3	-0.2 (-0.7)
78	1	64.8	3.3 (5.4)	57.2	5.0 (9.6)	62.8	4.8 (8.3)	38.8	3.2 (9.0)	34.0	3.7 (12.2)
	2	73.5	8.7 (13.4)	66.7	9.5 (16.6)	70.8	8.0 (12.7)	48.1	9.3 (24.0)	39.7	5.7 (16.8)
	3	66.1	-7.4 (-10.1)	56.1	-10.6 (-15.9)	62.0	-8.8 (-12.4)	38.0	-10.1 (-21.0)	31.9	-7.8 (-19.6)
	4	65.1	-1.0 (-1.5)	57.4	1.3 (2.3)	63.4	1.4 (2.3)	40.3	2.3 (6.1)	33.4	1.5 (4.7)
79	1	75.5	10.4 (16.0)	63.3	5.9 (10.3)	72.3	8.9 (14.0)	47.5	7.2 (17.9)	41.0	7.6 (22.8)

Appendix B Table 6. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	77.7	2.2 (2.9)	65.5	2.2 (3.5)	75.0	2.7 (3.7)	50.8	3.3 (6.9)	42.8	1.8 (4.4)
	3	87.9	10.2 (13.1)	74.3	8.8 (13.4)	79.4	4.4 (5.9)	59.8	9.0 (17.7)	52.4	9.6 (22.4)
	4	88.0	0.1 (0.1)	78.7	4.4 (5.9)	85.3	5.9 (7.4)	63.9	4.1 (6.9)	51.6	-0.8 (-1.5)
80	1	88.0	0.0 (0.0)	76.7	-2.0 (-2.5)	82.7	-2.6 (-3.0)	52.4	-11.5 (-18.0)	42.6	-9.0 (-17.4)
	2	83.8	-4.2 (-4.8)	75.2	-1.5 (-2.0)	82.1	-0.6 (-0.7)	48.2	-4.2 (-8.0)	38.8	-3.8 (-8.9)
	3	87.0	3.2 (3.8)	74.3	-0.9 (-1.2)	83.5	1.4 (1.7)	52.5	4.3 (8.9)	36.7	-2.1 (-5.4)
	4	90.7	3.7 (4.3)	75.1	0.8 (1.1)	82.2	-1.3 (-1.6)	52.7	0.2 (0.4)	35.2	-1.5 (-4.1)
81	1	84.3	-6.4 (-7.1)	72.8	-2.3 (-3.1)	79.8	-2.4 (-2.9)	45.6	-7.1 (-13.5)	29.1	-6.1 (-17.3)
	2	73.8	-10.5 (-12.5)	64.1	-8.7 (-12.0)	73.3	-6.5 (-8.1)	40.8	-4.8 (-10.5)	27.0	-2.1 (-7.2)

Appendix B Table 6. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
81	3	74.7	0.9 (1.2)	61.1	-3.0 (-4.7)	65.2	-8.1 (-11.1)	40.5	-0.3 (-0.7)	26.6	-0.4 (-1.5)
	4	76.2	1.5 (2.0)	60.7	-0.4 (-0.7)	67.9	2.7 (4.1)	42.5	2.0 (4.9)	23.8	-2.8 (-10.5)
82	1	69.5	-6.7 (-8.8)	61.8	1.1 (1.8)	70.3	2.4 (3.5)	44.2	1.7 (4.0)	21.7	-2.1 (-8.8)
	2	70.2	0.7 (1.0)	58.8	-3.0 (-4.9)	67.7	-2.6 (-3.7)	46.5	2.3 (5.2)	26.4	4.7 (21.7)
	3	60.0	-10.2 (-14.5)	52.5	-6.3 (-10.7)	63.0	-4.7 (-6.9)	39.6	-6.9 (-14.8)	17.2	-9.2 (-34.8)
	4	60.4	0.4 (0.7)	51.8	-0.7 (-1.3)	61.8	-1.2 (-1.9)	42.3	2.7 (6.8)	21.6	4.4 (25.6)
83	1	61.7	1.3 (2.2)	49.5	-2.3 (-4.4)	56.5	-5.3 (-8.6)	43.8	1.5 (3.5)	25.7	4.1 (19.0)
	2	60.2	-1.5 (-2.4)	54.0	4.5 (9.1)	52.1	-4.4 (-7.8)	44.6	0.8 (1.8)	25.3	-0.4 (-1.6)

Appendix B Table 6. (continued)

SOUTHWEST KANSAS

Year	Qtr.	Finney Rate c/bu.	Finney Rate Change c/bu. (%)	Ford Rate c/bu.	Ford Rate Change c/bu. (%)	Pratt Rate c/bu.	Pratt Rate Change c/bu. (%)	Scott Rate c/bu.	Scott Rate Change c/bu. (%)	Seward Rate c/bu.	Seward Rate Change c/bu. (%)
77	1	45.3	----- (-----)	47.0	----- (-----)	47.2	----- (-----)	40.7	----- (-----)	----	----- (-----)
	2	50.7	5.4 (11.9)	47.6	0.6 (1.3)	48.8	1.6 (3.4)	49.1	8.4 (20.6)	----	----- (-----)
	3	46.2	-4.5 (-8.9)	43.4	-4.2 (-8.8)	42.1	-6.7 (-13.7)	47.2	-1.9 (-3.9)	----	----- (-----)
	4	47.4	1.2 (2.6)	44.6	1.2 (2.8)	42.4	0.3 (0.7)	47.7	0.5 (1.1)	----	----- (-----)
78	1	53.7	6.3 (13.3)	47.5	2.9 (6.5)	47.0	4.6 (10.8)	53.2	5.5 (11.5)	45.7	---- (-----)
	2	59.1	5.4 (10.1)	56.6	9.1 (19.2)	51.6	4.6 (9.8)	61.1	7.9 (14.9)	46.4	0.7 (1.5)
	3	51.0	-8.1 (-13.7)	48.9	-7.7 (-13.6)	44.7	-6.9 (-13.4)	53.3	-7.8 (-12.8)	38.5	-7.9 (-17.0)
	4	55.7	4.7 (9.2)	50.6	1.7 (3.5)	48.7	4.0 (8.9)	57.1	3.8 (7.1)	41.8	3.3 (8.6)
79	1	65.6	9.9 (17.8)	59.2	8.6 (17.0)	56.0	7.3 (15.0)	66.1	9.0 (15.8)	52.0	10.2 (24.4)

Appendix B Table 6. (continued)

SOUTHWEST KANSAS

		Finney		Ford		Pratt		Scott		Seward	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
79	2	66.4	0.8 (1.2)	60.7	1.5 (2.5)	56.7	0.7 (1.3)	68.1	2.0 (3.0)	53.1	1.1 (2.1)
	3	65.1	-1.3 (-2.0)	59.5	-1.2 (-2.0)	50.7	-6.0 (-10.6)	62.4	-5.7 (-8.4)	58.4	5.3 (10.0)
	4	77.9	12.8 (19.7)	67.9	8.4 (14.1)	58.0	7.3 (14.4)	71.5	9.1 (14.6)	59.5	1.4 (2.4)
80	1	72.6	-5.3 (-6.8)	66.5	-1.4 (-2.1)	59.0	1.0 (1.7)	73.2	1.7 (2.4)	58.5	-1.3 (-2.2)
	2	78.1	5.5 (7.6)	74.3	7.8 (11.7)	67.5	8.5 (14.4)	78.7	5.5 (7.5)	66.4	7.9 (13.5)
	3	75.8	-2.3 (-2.9)	71.2	-3.1 (-4.2)	65.9	-1.6 (-2.4)	78.2	-0.5 (-0.6)	63.0	-3.4 (-5.1)
	4	71.2	-4.6 (-6.1)	64.7	-6.5 (-9.1)	59.2	-6.7 (-10.2)	73.1	-5.1 (-6.5)	54.0	-9.0 (-14.3)
81	1	74.0	2.8 (3.9)	64.7	0.0 (0.0)	55.0	-4.2 (-7.1)	73.5	0.4 (0.5)	53.7	-0.3 (-0.6)
	2	71.2	-2.8 (-3.8)	62.5	-2.2 (-3.4)	56.0	1.0 (1.8)	71.4	-2.1 (-2.9)	60.9	7.2 (13.4)

Appendix B Table 6. (continued)

SOUTHWEST KANSAS

		Finney		Ford		Pratt		Scott		Seward	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
81	3	67.3	-3.9 (-5.5)	61.5	-1.0 (-1.6)	50.1	-5.9 (-10.5)	66.4	-5.0 (-7.0)	58.3	-2.6 (-4.3)
	4	70.5	3.2 (4.8)	63.8	2.3 (3.7)	54.3	4.2 (8.4)	68.8	2.4 (3.6)	63.7	5.4 (9.3)
82	1	70.2	-0.3 (-0.4)	61.1	-2.7 (-4.2)	50.2	-4.1 (-7.6)	67.2	-1.6 (-2.3)	60.2	-3.5 (-5.5)
	2	74.0	3.8 (5.4)	64.9	3.8 (6.2)	52.8	2.6 (5.2)	71.6	4.4 (6.5)	62.3	2.1 (3.5)
	3	61.0	-13.0 (-17.6)	55.4	-9.5 (-14.6)	38.4	-14.4 (-27.3)	60.0	-11.6 (-16.2)	53.9	-8.4 (-13.5)
	4	60.4	-0.6 (-1.0)	54.5	-0.9 (-1.6)	38.3	-0.1 (-0.3)	59.5	-0.5 (-0.8)	53.7	-0.2 (-0.4)
83	1	61.5	1.1 (1.8)	56.1	1.6 (2.9)	45.7	7.4 (19.3)	61.6	2.1 (3.5)	55.1	1.4 (2.6)
	2	72.6	11.1 (18.0)	64.0	7.9 (14.1)	53.8	8.1 (17.7)	67.5	5.9 (9.6)	65.8	10.7 (19.4)

Appendix B Table 6. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
77	1	42.8	----- (-----)	46.3	----- (-----)	45.2	----- (-----)	46.9	----- (-----)
	2	43.2	0.4 (0.9)	47.8	1.5 (3.2)	46.8	1.6 (3.5)	45.6	-1.3 (-2.8)
	3	41.0	-2.2 (-5.1)	43.9	-3.9 (-8.2)	43.0	-3.8 (-8.1)	42.5	-3.1 (-6.8)
	4	42.9	1.9 (4.6)	46.4	2.5 (5.7)	44.9	1.9 (4.4)	45.9	3.4 (8.0)
78	1	47.6	4.7 (11.0)	48.6	2.2 (4.7)	49.3	4.4 (9.8)	50.5	4.6 (10.0)
	2	54.4	6.8 (14.3)	60.3	11.7 (24.1)	61.0	11.7 (23.7)	56.0	5.5 (10.9)
	3	46.6	-7.8 (-14.3)	50.7	-9.6 (-15.9)	47.5	-13.5 (-22.1)	43.6	-12.4 (-22.1)
	4	46.9	0.3 (0.6)	51.4	0.7 (1.4)	49.6	2.1 (4.4)	45.9	2.3 (5.3)
79	1	55.8	8.9 (19.0)	58.2	6.8 (13.2)	58.7	9.1 (18.3)	54.2	8.3 (18.1)

Appendix B Table 6. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Rate c/bu.	Cloud Rate Change c/bu. (%)	Mitchell Rate c/bu.	Mitchell Rate Change c/bu. (%)	Russell Rate c/bu.	Russell Rate Change c/bu. (%)	Saline Rate c/bu.	Saline Rate Change c/bu. (%)
79	2	56.8	1.0 (1.8)	57.5	-0.7 (-1.2)	61.5	2.8 (0.5)	53.8	-0.4 (-0.7)
	3	64.4	7.4 (13.0)	61.9	4.4 (7.7)	57.0	-4.5 (-7.3)	55.6	1.8 (3.3)
	4	65.2	1.0 (1.6)	66.3	4.4 (7.1)	64.0	7.0 (12.3)	56.3	0.7 (1.3)
80	1	57.0	-8.2 (-12.6)	60.3	-6.0 (-9.1)	60.3	-3.7 (-5.9)	53.8	-2.5 (-4.4)
	2	56.2	-0.8 (-1.4)	59.3	-1.0 (-1.7)	65.4	5.1 (8.5)	51.7	-2.1 (-3.9)
	3	57.5	1.3 (2.3)	61.0	1.7 (2.9)	62.2	-3.2 (-4.9)	58.1	6.4 (12.4)
	4	57.4	-0.1 (-0.2)	58.1	-2.9 (-4.8)	58.0	-4.2 (-6.8)	59.0	0.9 (-1.5)
81	1	51.7	-5.7 (-9.9)	57.2	-0.9 (-1.5)	54.3	-3.7 (-6.4)	47.8	-11.2 (-19.0)
	2	44.9	-6.8 (-13.2)	50.5	-6.7 (-11.7)	43.6	-10.7 (-19.7)	42.5	-5.3 (-11.1)

Appendix B Table 6. (continued)

CENTRAL KANSAS

		Cloud		Mitchell		Russell		Saline	
Year	Qtr.	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)	Rate c/bu.	Rate Change c/bu. (%)
81	3	45.1	0.2 (0.4)	50.6	0.1 (0.2)	47.0	3.4 (7.8)	22.8	-19.7 (-46.4)
	4	44.7	-0.4 (-0.9)	48.3	-2.3 (-4.5)	47.1	0.1 (0.2)	25.2	2.4 (10.5)
82	1	42.4	-2.3 (-5.1)	45.5	-2.8 (-5.8)	46.0	-1.1 (-2.3)	26.4	1.2 (4.8)
	2	43.7	1.3 (3.1)	48.8	3.3 (7.3)	47.7	1.7 (3.7)	34.2	7.8 (29.5)
	3	42.2	-1.5 (-3.4)	46.4	-2.4 (-4.9)	43.1	-4.6 (-9.6)	25.1	-9.1 (-26.6)
	4	41.1	-1.1 (-2.6)	47.2	0.8 (1.7)	43.7	0.6 (1.4)	19.9	-5.2 (-20.7)
83	1	41.2	0.1 (0.2)	43.7	-3.5 (-7.4)	39.7	-4.0 (-9.2)	22.7	2.8 (14.1)
	2	40.8	-0.4 (-1.0)	45.2	1.5 (3.4)	43.2	3.5 (8.8)	27.5	4.8 (21.1)

Appendix B TABLE 7. Quarterly Mean and Standard Deviation of the Kansas City-Local Total Margin - January 1977 to June 1983.

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.
77	1	15.0	2.1	16.4	1.8	15.2	0.9	16.7	2.2	7.1	1.3
	2	15.2	1.8	13.5	2.5	15.9	2.3	14.9	3.5	11.2	3.4
	3	14.5	0.7	12.5	1.2	14.7	1.0	8.9	3.6	11.5	1.1
	4	15.5	3.1	14.0	3.2	14.7	3.7	13.0	3.2	10.9	2.9
78	1	17.3	5.3	17.7	6.9	18.3	7.5	15.3	7.2	14.0	5.8
	2	25.7	7.7	26.8	6.4	25.9	7.9	24.3	6.0	19.6	7.7
	3	17.1	2.0	15.1	.2	15.5	1.8	13.5	1.2	11.4	1.5
	4	15.5	3.1	16.0	2.9	16.3	3.9	15.6	3.2	12.7	4.2
79	1	23.0	4.4	19.3	3.5	22.3	5.7	21.5	5.0	19.0	4.7
	2	25.0	2.9	21.4	2.8	24.8	3.1	24.7	3.2	20.6	4.1
	3	33.6	3.2	28.9	3.9	28.0	4.5	32.8	4.7	29.3	3.8
	4	29.2	3.9	29.3	4.3	29.5	5.0	34.7	4.0	26.8	6.8
80	1	27.3	4.3	26.2	2.6	25.3	4.4	22.3	3.6	17.0	4.1

Appendix B Table 7. (continued)

		NORTHWEST KANSAS						NORTHEAST KANSAS			
		Cheyenne		Sheridan		Thomas		Marshall		Shawnee	
Year	Qtr.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.	Margin c/bu.	Std. Dev. c/bu.
80	2	20.5	2.8	22.4	2.1	22.2	2.0	16.8	2.2	12.3	3.2
	3	19.7	2.2	17.9	1.3	20.5	1.9	19.3	2.1	8.5	2.1
	4	22.5	2.4	17.9	1.9	18.4	3.4	19.1	1.9	6.8	2.3
81	1	12.0	2.1	12.9	2.0	11.9	4.2	10.2	1.9	-0.7	2.4
	2	8.3	6.2	14.5	3.9	18.8	5.8	16.6	8.1	0.0	4.1
	3	16.2	4.8	14.6	3.3	14.7	3.7	19.5	2.1	4.5	6.9
	4	13.7	5.9	10.7	5.3	13.9	5.8	19.5	5.4	2.3	6.6
82	1	4.0	3.2	10.7	2.6	13.8	4.0	19.5	2.6	-0.8	3.3
	2	6.2	6.9	12.3	5.9	11.2	7.6	21.5	5.0	2.5	5.6
	3	4.0	4.1	6.0	5.7	6.5	3.9	14.6	5.7	-1.8	4.6
	4	3.9	3.2	5.6	3.4	8.0	4.7	17.5	3.4	-3.6	8.7
83	1	4.2	3.4	2.5	3.5	5.5	2.1	19.3	2.1	7.2	3.0
	2	2.7	4.6	7.0	4.1	1.1	2.7	20.1	3.8	6.8	3.7

Appendix B Table 7. (continued)

SOUTHWEST KANSAS

Year	Qtr.	Finney Margin c/bu.	Finney Std. Dev. c/bu.	Ford Margin c/bu.	Ford Std. Dev. c/bu.	Pratt Margin c/bu.	Pratt Std. Dev. c/bu.	Scott Margin c/bu.	Scott Std. Dev. c/bu.	Seward Margin c/bu.	Seward Std. Dev. c/bu.
77	1	1.3	1.9	10.5	2.1	12.7	1.7	-1.8	2.2	----	----
	2	6.7	3.7	11.1	2.7	14.3	4.6	6.6	3.9	----	----
	3	2.2	1.1	6.9	1.6	7.6	1.1	4.7	2.1	----	----
	4	2.6	3.1	7.5	3.2	7.1	3.5	4.4	3.2	----	----
78	1	7.7	6.9	9.5	4.7	10.5	4.9	8.7	7.2	-4.8	5.6
	2	12.7	7.8	18.2	6.4	14.7	6.5	16.2	7.4	-4.6	10.3
	3	3.5	1.0	9.4	1.3	6.8	0.7	6.8	1.2	-14.5	1.6
	4	7.7	3.4	10.6	3.3	10.3	4.2	10.2	3.7	-11.7	3.4
79	1	14.6	5.4	16.7	5.1	15.5	4.4	16.1	5.2	-4.5	3.6
	2	15.2	5.6	18.0	4.2	16.0	4.9	17.9	5.0	-3.6	4.7
	3	12.3	5.2	15.6	1.8	8.8	1.9	11.0	3.8	0.1	4.3
	4	20.6	6.0	20.4	4.5	12.6	4.6	15.7	4.4	-3.4	5.9
80	1	13.6	4.0	17.7	3.5	12.3	3.6	15.7	3.1	-6.5	2.9

Appendix B Table 7. (continued)

SOUTHWEST KANSAS

Year	Qtr.	Finney Margin c/bu.	Finney Std. Dev. c/bu.	Ford Margin c/bu.	Ford Std. Dev. c/bu.	Pratt Margin c/bu.	Pratt Std. Dev. c/bu.	Scott Margin c/bu.	Scott Std. Dev. c/bu.	Seward Margin c/bu.	Seward Std. Dev. c/bu.
80	2	16.7	4.2	23.4	3.2	18.6	3.8	18.8	3.3	-1.5	4.0
	3	10.5	3.7	17.3	4.9	14.4	4.3	14.8	3.7	-8.8	5.1
	4	5.0	3.6	10.0	4.2	7.0	4.0	8.9	3.8	-18.8	3.8
81	1	4.2	6.9	6.3	4.1	-0.3	4.4	5.5	6.3	-22.7	5.2
	2	8.0	6.9	11.2	6.7	9.6	8.9	13.5	8.2	-7.7	12.6
	3	7.8	7.1	16.5	6.1	15.1	6.1	12.9	5.7	6.3	6.9
	4	17.2	5.4	19.0	5.4	19.1	5.6	11.8	5.9	7.7	4.9
82	1	15.2	5.5	10.6	4.6	10.7	5.6	7.7	4.3	1.7	3.5
	2	12.8	9.3	11.3	8.2	13.3	11.9	12.1	10.0	3.8	10.6
	3	-10.0	5.8	-3.1	4.5	-1.1	5.6	0.5	4.3	-4.6	4.7
	4	-10.6	4.4	-0.3	7.0	-1.2	4.4	0.0	3.8	-4.6	2.3
83	1	8.5	4.2	6.0	4.4	5.7	5.5	8.7	3.9	-3.9	5.4
	2	20.5	9.9	14.2	10.2	13.8	8.1	15.2	9.9	6.8	8.0

Appendix B Table 7. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Margin c/bu.	Cloud Std. Dev. c/bu.	Mitchell Margin c/bu.	Mitchell Std. Dev. c/bu.	Russell Margin c/bu.	Russell Std. Dev. c/bu.	Saline Margin c/bu.	Saline Std. Dev. c/bu.
77	1	14.3	1.8	15.8	1.4	10.7	1.3	16.4	2.0
	2	14.7	2.5	17.3	2.4	12.3	2.7	15.1	2.3
	3	12.5	1.2	13.4	1.0	8.5	0.9	12.0	1.0
	4	13.9	3.0	15.3	2.3	9.6	3.0	14.8	3.0
78	1	17.6	6.3	16.6	8.2	12.8	7.2	18.5	4.7
	2	24.2	6.0	28.1	7.2	24.2	7.1	23.7	8.5
	3	15.6	1.6	17.7	1.3	9.5	2.5	10.6	1.8
	4	15.5	3.5	18.0	3.1	11.2	4.1	12.5	3.7
79	1	22.3	4.0	22.7	3.5	18.2	4.7	18.7	3.8
	2	23.3	3.8	22.0	4.9	20.8	4.4	18.3	3.6
	3	29.8	2.5	25.5	3.2	15.1	2.2	19.2	2.0
	4	27.7	5.3	26.8	4.4	18.5	4.3	16.7	5.0
80	1	18.6	1.8	19.5	2.5	13.6	3.8	13.0	2.9

Appendix B Table 7. (continued)

CENTRAL KANSAS

Year	Qtr.	Cloud Margin c/bu.	Cloud Std. Dev. c/bu.	Mitchell Margin c/bu.	Mitchell Std. Dev. c/bu.	Russell Margin c/bu.	Russell Std. Dev. c/bu.	Saline Margin c/bu.	Saline Std. Dev. c/bu.
80	2	16.3	1.5	16.4	1.7	16.5	3.3	8.8	4.6
	3	15.0	1.8	15.5	1.9	10.7	3.7	12.5	5.4
	4	14.2	2.3	12.0	4.8	5.8	3.7	12.9	4.9
81	1	5.8	2.2	8.7	2.6	-1.0	4.7	-0.7	6.5
	2	0.6	5.3	14.3	6.7	4.0	7.0	4.6	8.4
	3	1.6	3.5	19.6	4.3	12.0	4.4	-8.7	2.7
	4	13.7	5.4	14.8	5.4	9.1	5.7	-8.3	5.1
82	1	9.9	2.8	10.5	2.7	6.7	2.8	-7.6	2.5
	2	11.2	7.3	13.8	7.5	9.2	8.0	0.2	7.7
	3	9.7	3.8	11.4	4.2	4.6	5.6	-8.9	5.5
	4	8.6	2.7	12.7	3.8	5.2	5.9	-14.8	2.3
83	1	8.2	2.7	8.7	3.3	0.7	5.0	-13.3	2.6
	2	7.8	4.5	10.2	6.6	4.2	7.2	-8.5	8.4

APPENDIX B TABLE 8. ANOVA Table for the Mean Kansas City-Local Total Margin

ANALYSIS DF VARIANCE PROCEOURE

DEPENDENT VARIABLE: KCLMGMN

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	45	22064.46702976	490.32148955	36.11
ERROR	234	3177.41693452	13.57870485	PR > F
CORRECTED TOTAL	279	25241.88396429		0.0001

R-SQUARE	C.V.	ROOT MSE	KCLMGMN MEAN
0.874121	29.7283	3.68492942	12.39535714

SOURCE	DF	ANOVA SS	F VALUE	PR > F
TIME	1	4892.33072024	360.29	0.0001
QT(TIME)	18	4183.64681548	17.12	0.0001
LOC	13	9240.07446429	52.34	0.0001
LOC*TIME	13	3748.41502976	21.23	0.0001

TESTS OF HYPOTHESES USING THE ANOVA MS FOR QT(TIME) AS AN ERROR TERM

SOURCE	DF	ANOVA SS	F VALUE	PR > F
TIME	1	4892.33072024	21.05	0.0002

APPENDIX B TABLE 9. ANOVA Table for the Kansas City-Local Total Margin Variability

ANALYSIS OF VARIANCE PROCEOURE

OEPENOENT VARIABLE: KCLMGSD

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MOOEL	45	810.38279167	18.00850648	15.68
ERROR	234	268.77717262	1.14862040	PR > F
CORRECTEO TOTAL	279	1079.15996429		0.0001

R-SQUARE	C.V.	ROOT MSE	KCLMGSO MEAN
0.750939	23.8713	1.07173709	4.48964286

SOURCE	OF	ANOVA SS	F VALUE	PR > F
TIME	1	87.90862500	76.53	0.0001
QT(TIME)	18	596.78491071	28.86	0.0001
LOC	13	88.32746429	5.92	0.0001
LOC*TIME	13	37.36179167	2.50	0.0033

TESTS OF HYPOTHESES USING THE ANOVA MS FOR QT(TIME) AS AN ERROR TERM

SOURCE	OF	ANOVA SS	F VALUE	PR > F
TIME	1	87.90862500	2.65	0.1208

APPENDIX B TABLE 10. ANOVA Table for Test of Seasonality in the Mean and the Variability of the Kansas City-Local Total Margin

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: KCLMGMN

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	55	10655.71767857	193.74032143	2.88
ERROR	224	15074.97200000	67.29898214	PR > F
CORRECTED TOTAL	279	25730.68967857		0.0001

R-SQUARE	C.V.	ROOT MSE	KCLMGMN MEAN
0.414125	72.2397	8.20359568	11.35607143

SOURCE	DF	TYPE I SS	F VALUE	PR > F
LOC	13	9652.88417857	11.03	0.0001
CYQTR	3	179.68153571	0.89	0.4491
LOC*CYQTR	39	823.15196429	0.31	1.0000

SOURCE	DF	TYPE III SS	F VALUE	PR > F
LOC	13	9652.88417857	11.03	0.0001
CYQTR	3	179.68153571	0.89	0.4491
LOC*CYQTR	39	823.15196429	0.31	1.0000

GENERAL LINEAR MODELS PROCEDURE

LEAST SQUARES MEANS

CYQTR	KCLMGMN LSMEAN	STD ERR LSMEAN	PROB > |T| HO:LSMEAN=0	LSMEAN NUMBER
1	11.3742857	0.9805172	0.0001	1
2	11.3942857	0.9805172	0.0001	2
3	10.1957143	0.9805172	0.0001	3
4	12.4600000	0.9805172	0.0001	4

PROB > |T| HO: LSMEAN(I)=LSMEAN(J)

I/J	1	2	3	4
1	.	0.9885	0.3963	0.4345
2	0.9885	.	0.3883	0.4430
3	0.3963	0.3883	.	0.1039
4	0.4345	0.4430	0.1039	.

APPENDIX B TABLE 10. (continued)

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: KCLMGSO

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	55	415.25625000	7.55011364	2.55
ERROR	224	664.52800000	2.96664286	PR > F
CORRECTED TOTAL	279	1079.78425000		0.0001

R-SQUARE	C.V.	ROOT MSE	KCLMGSO MEAN
0.384573	39.5271	1.72239451	4.35750000

SOURCE	DF	TYPE I SS	F VALUE	PR > F
LOC	13	129.23075000	3.35	0.0001
CYQTR	3	200.28382143	22.50	0.0001
LOC*CYQTR	39	85.74167857	0.74	0.8683

SOURCE	DF	TYPE III SS	F VALUE	PR > F
LOC	13	129.23075000	3.35	0.0001
CYQTR	3	200.28382143	22.50	0.0001
LOC*CYQTR	39	85.74167857	0.74	0.8683

GENERAL LINEAR MODELS PROCEDURE

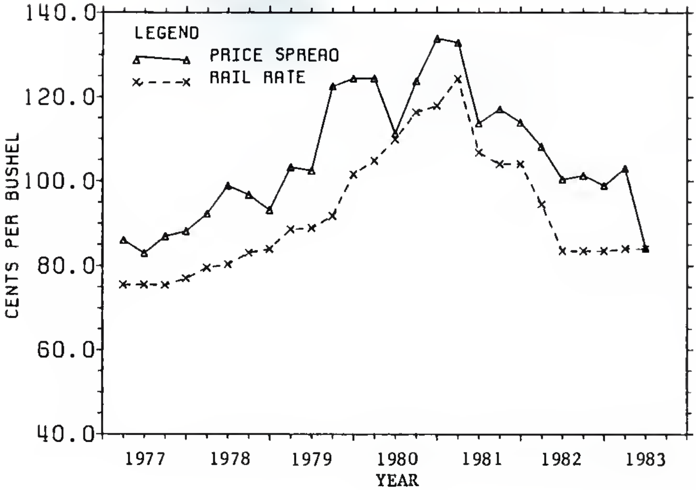
LEAST SQUARES MEANS

CYQTR	KCLMGSO LSMEAN	STD ERR LSMEAN	PROB > |T| HO:LSMEAN=0	LSMEAN NUMBER
1	3.53428571	0.20586552	0.0001	1
2	4.35571429	0.20586552	0.0001	2
3	3.81000000	0.20586552	0.0001	3
4	5.72000000	0.20586552	0.0001	4

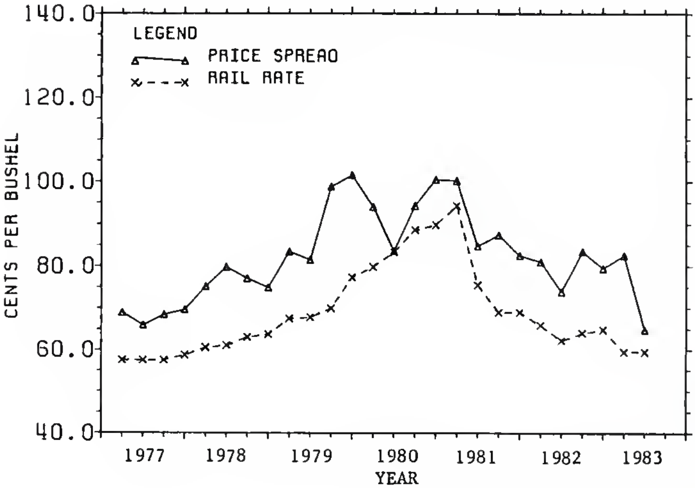
PROB > |T| HO: LSMEAN(I)=LSMEAN(J)

I/J	1	2	3	4
1	.	0.0052	0.3446	0.0001
2	0.0052	.	0.0622	0.0001
3	0.3446	0.0622	.	0.0001
4	0.0001	0.0001	0.0001	.

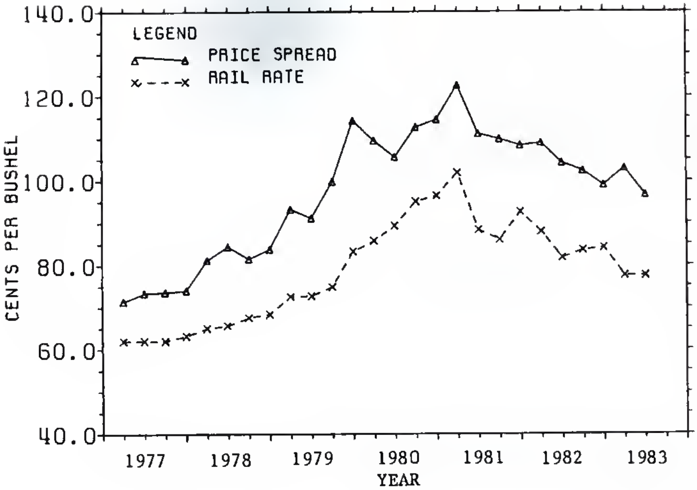
APPENDIX B FIGURE 1
GULF-CHEYENNE PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



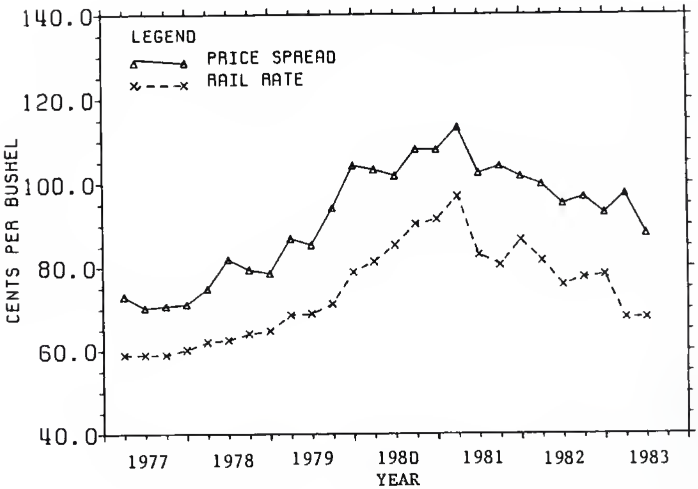
APPENDIX B FIGURE 2
GULF-CLOUD PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



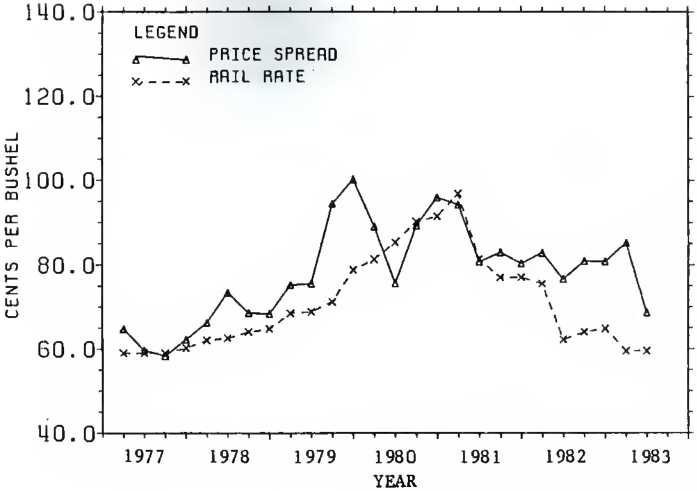
APPENDIX B FIGURE 3
GULF-FINNEY PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



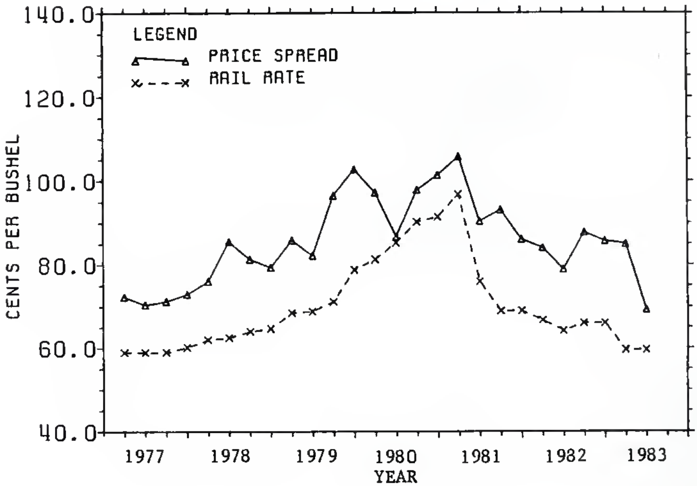
APPENDIX B FIGURE 4
GULF-FORD PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



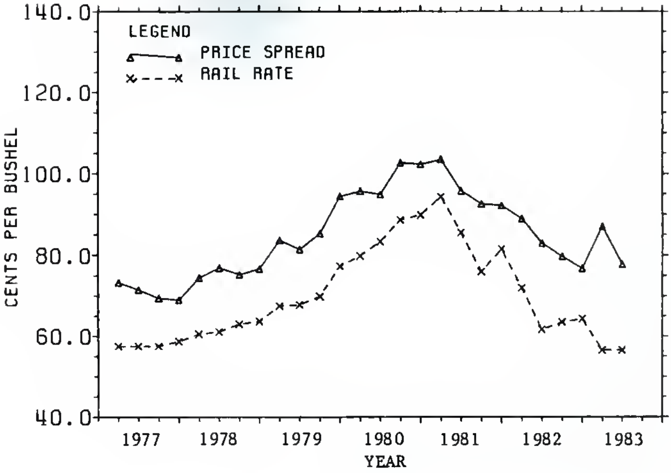
APPENDIX B FIGURE 5
GULF-MARSHALL PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



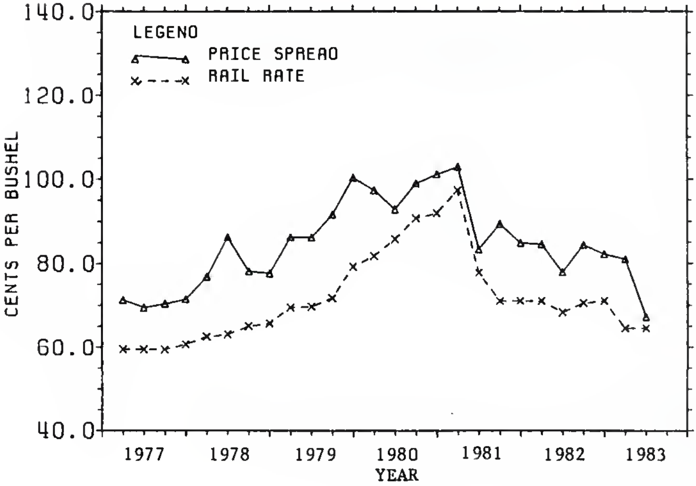
APPENDIX B FIGURE 6
GULF-MITCHELL PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



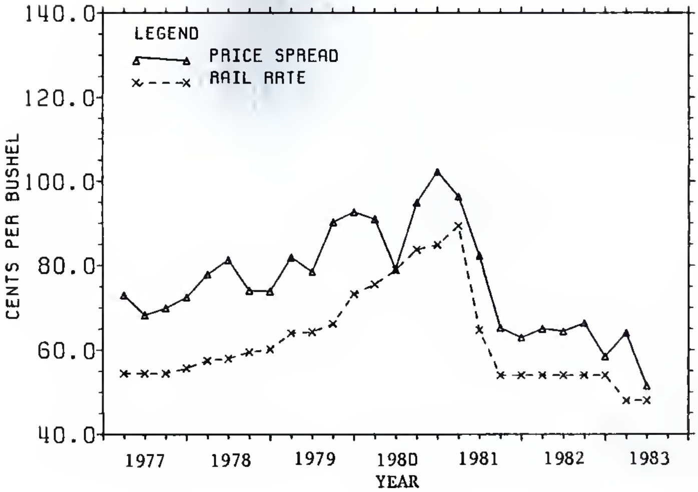
APPENDIX B FIGURE 7
GULF-PRATT PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



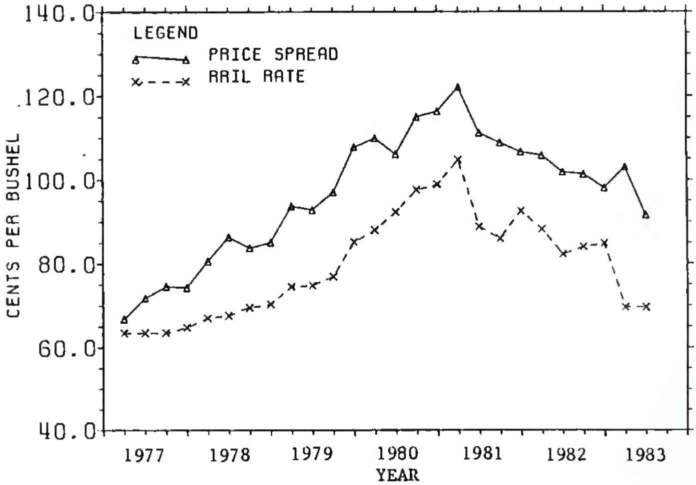
APPENDIX B FIGURE 8
GULF-RUSSELL PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



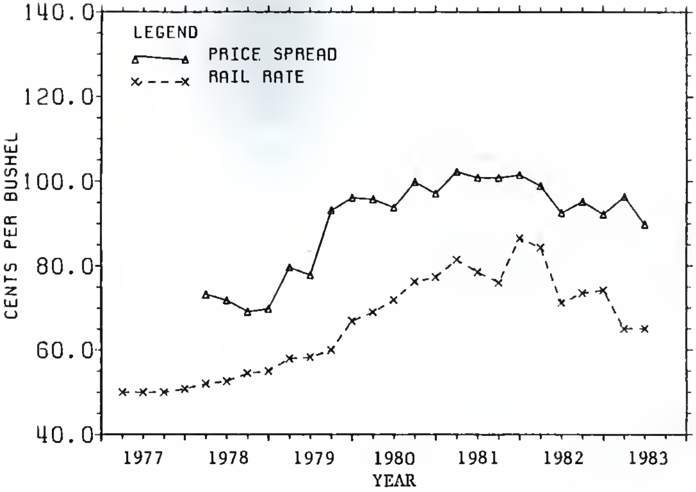
APPENOIX B FIGURE 9
GULF-SALINE PRICE SPREAO
BY QUARTER FROM 1977 TO 1983



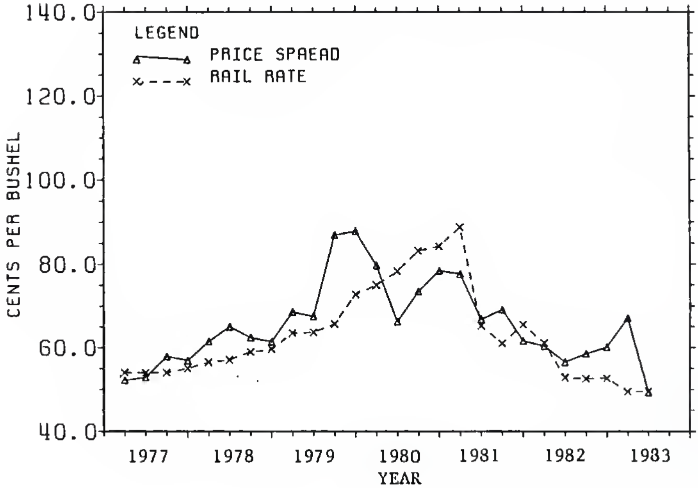
APPENOIX B FIGURE 10
GULF-SCOTT PRICE SPREAD
BY DUARTER FROM 1977 TO 1983



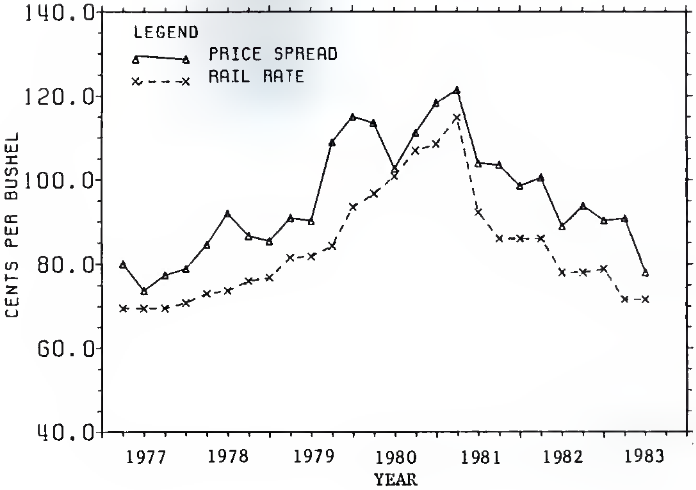
APPENOIX B FIGURE 11
GULF-SEWARD PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



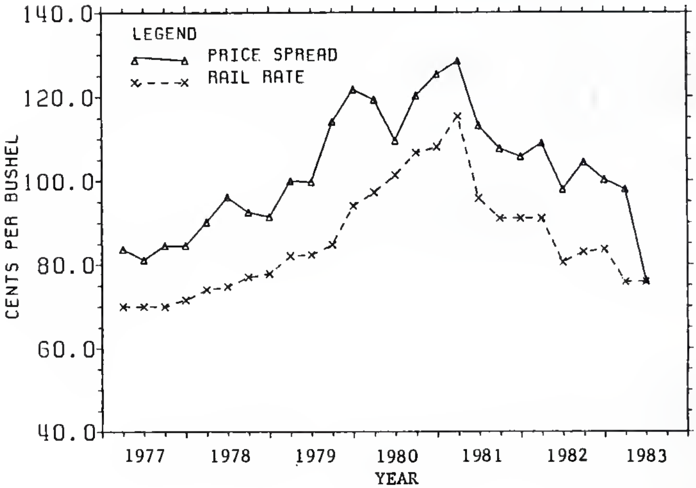
APPENOIX B FIGURE 12
GULF-SHAWNEE PRICE SPREAO
8Y QUARTER FROM 1977 TO 1983



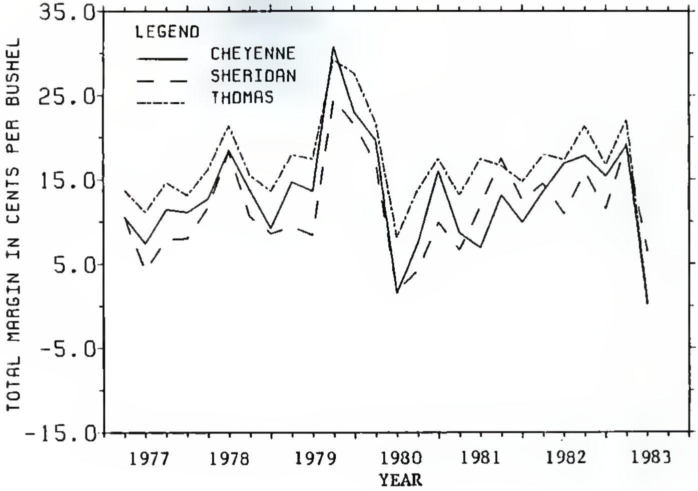
APPENDIX B FIGURE 13
GULF-SHERIDAN PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



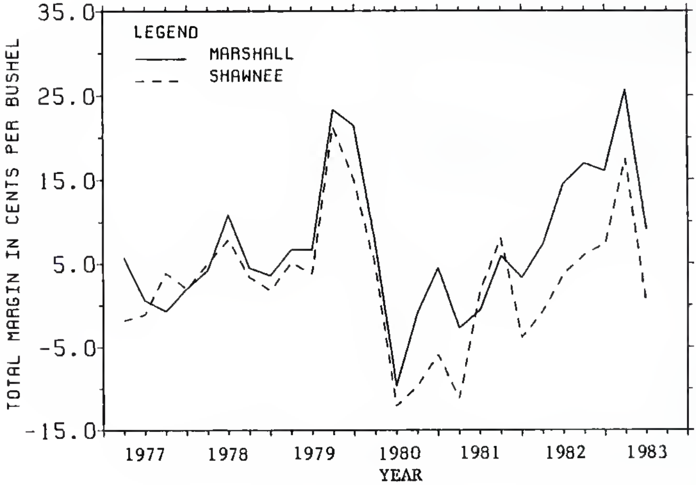
APPENDIX B FIGURE 14
GULF-THOMAS PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



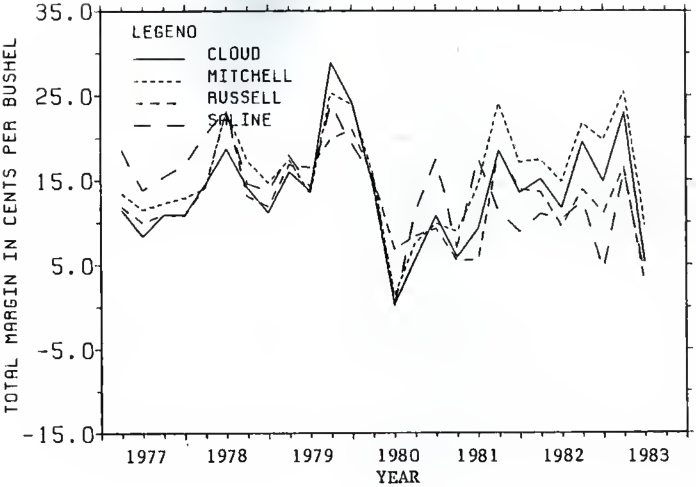
APPENDIX B FIGURE 15
NORTHWEST'S GULF-LOCAL TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



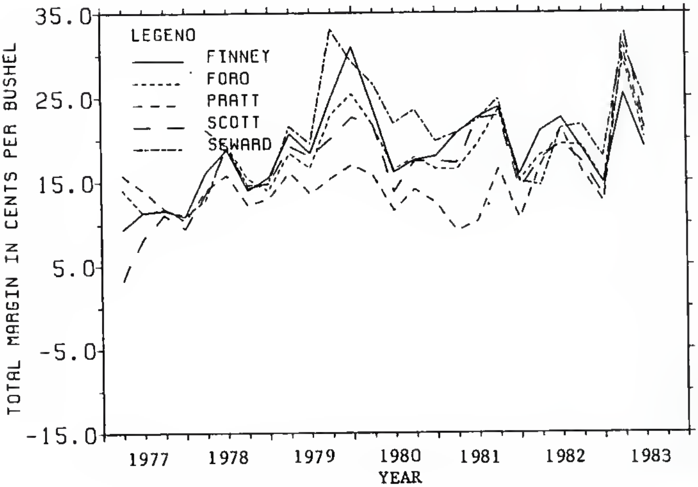
APPENOIX B FIGURE 16
NORTHEAST'S GULF-LOCAL TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



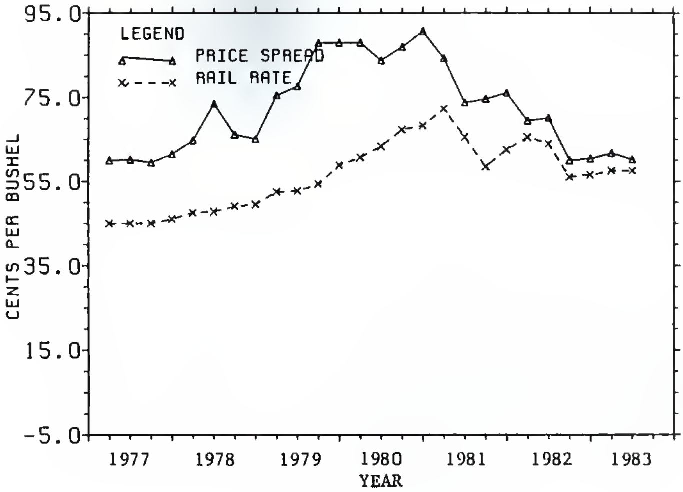
APPENDIX B FIGURE 17
CENTRAL'S GULF-LOCAL TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



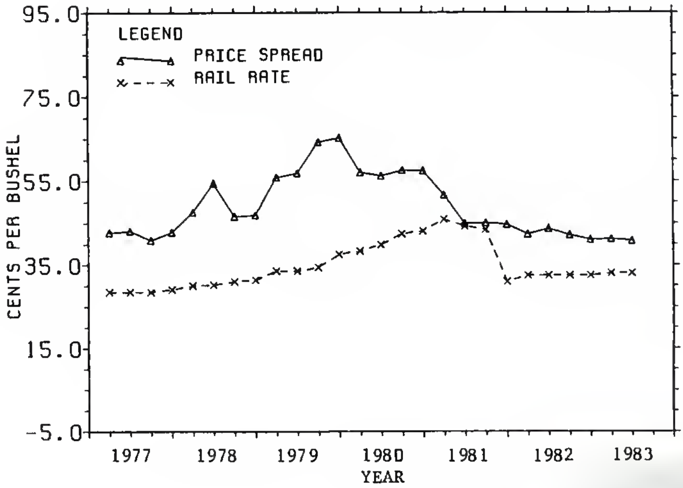
APPENDIX B FIGURE 18
SOUTHWEST'S GULF-LOCAL TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



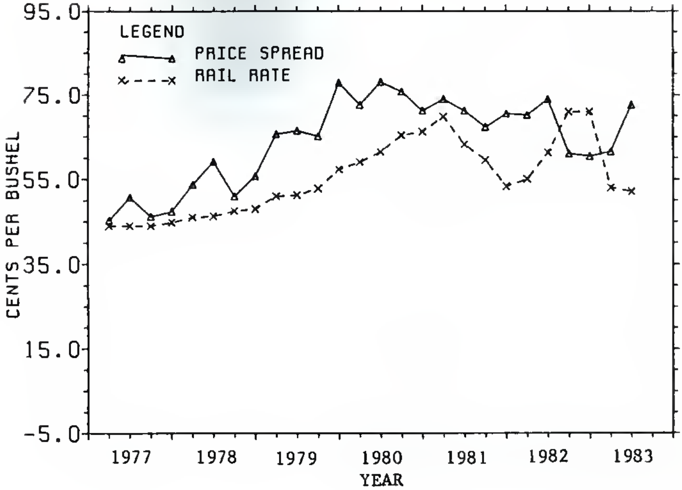
APPENDIX B FIGURE 19
KANSAS CITY-CHEYENNE PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



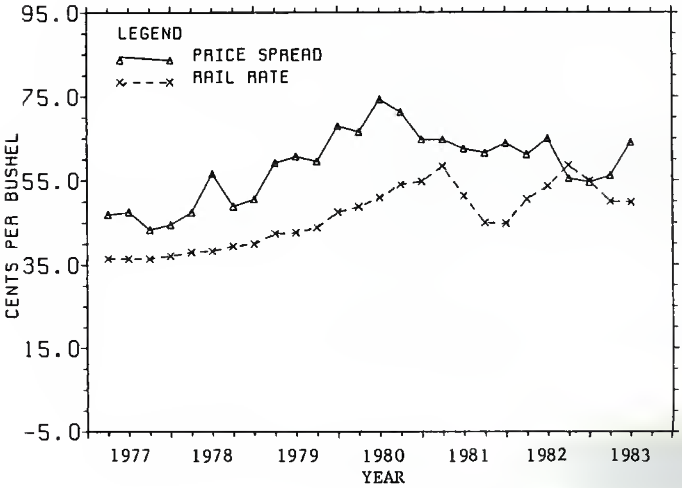
APPENDIX B FIGURE 20
KANSAS CITY-CLOUD PRICE SPREAO
BY QUARTER FROM 1977 TO 1983



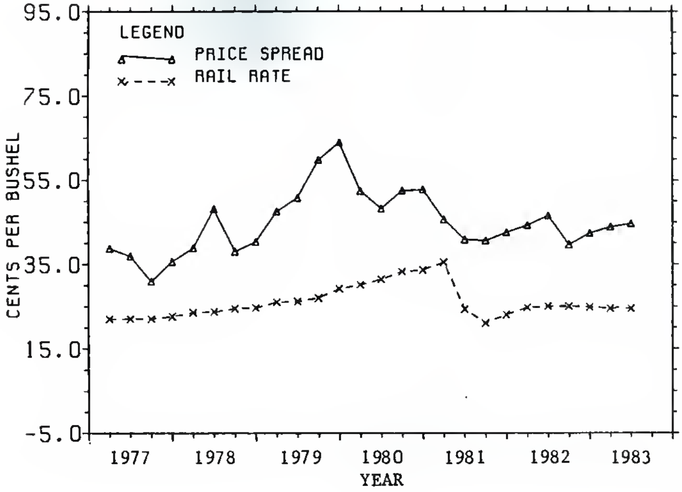
APPENDIX B FIGURE 21
KANSAS CITY-FINNEY PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



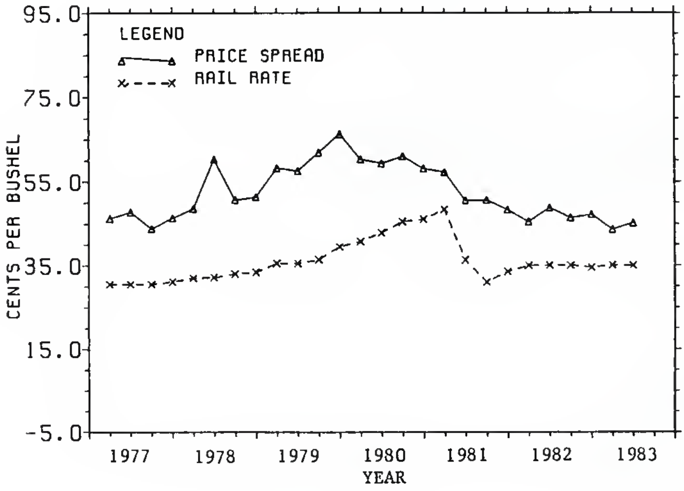
APPENDIX B FIGURE 22
KANSAS CITY-FORD PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



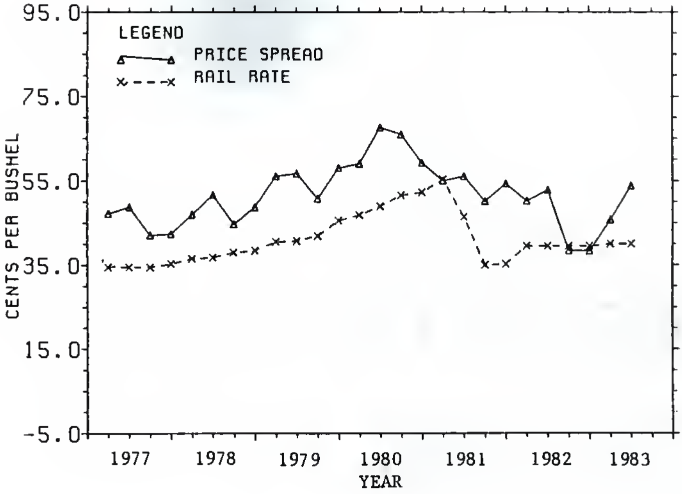
APPENDIX B FIGURE 23
KANSAS CITY-MARSHALL PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



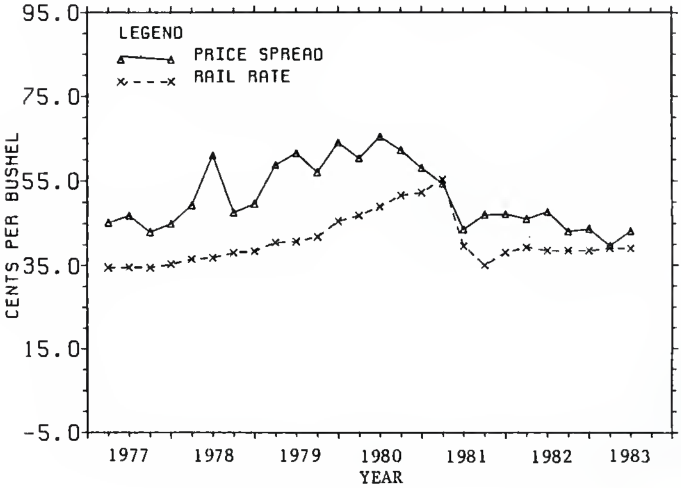
APPENDIX B FIGURE 24
KANSAS CITY-MITCHELL PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



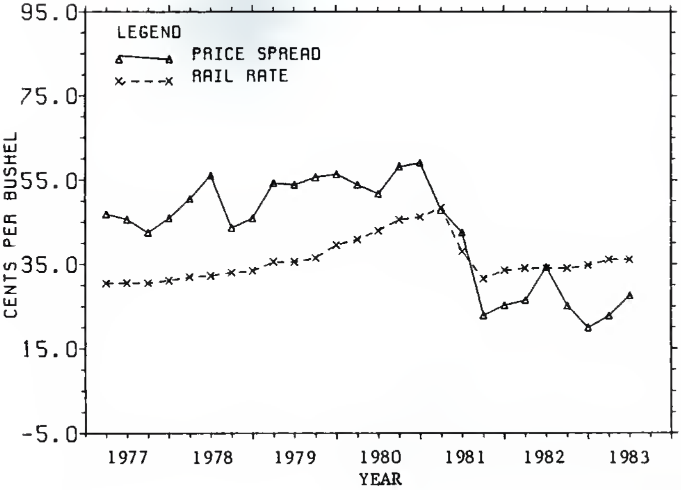
APPENDIX B FIGURE 25
KANSAS CITY-PRATT PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



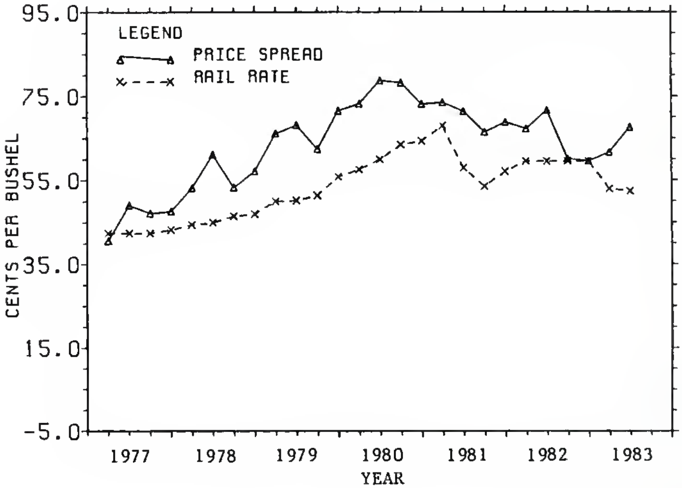
APPENDIX B FIGURE 26
KANSAS CITY-RUSSELL PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



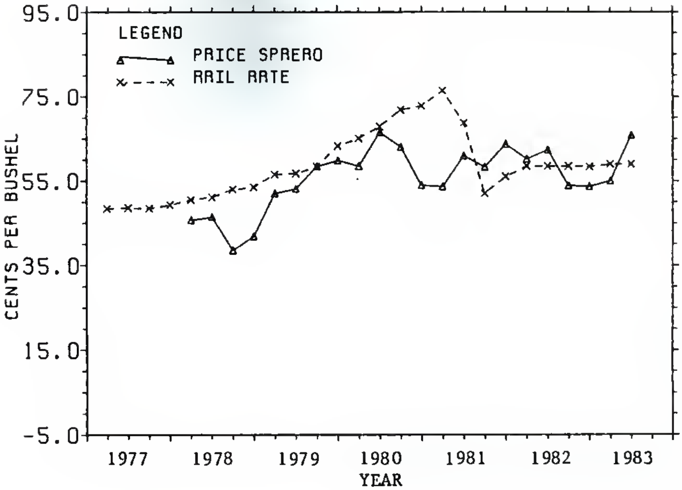
APPENDIX B FIGURE 27
KANSAS CITY-SALINE PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



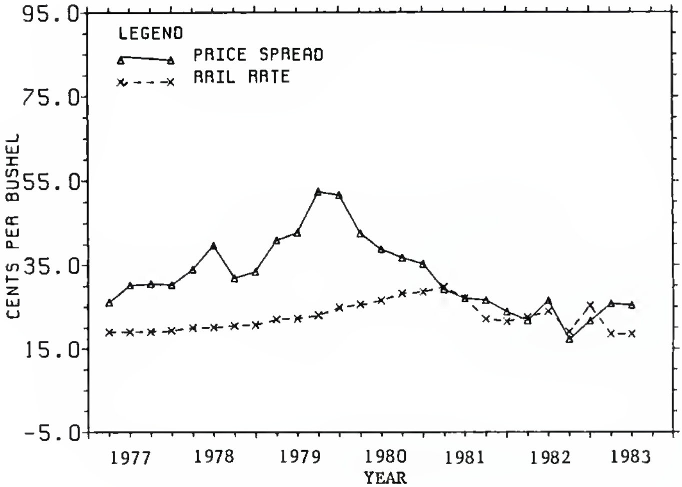
APPENDIX B FIGURE 28
KANSAS CITY-SCOTT PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



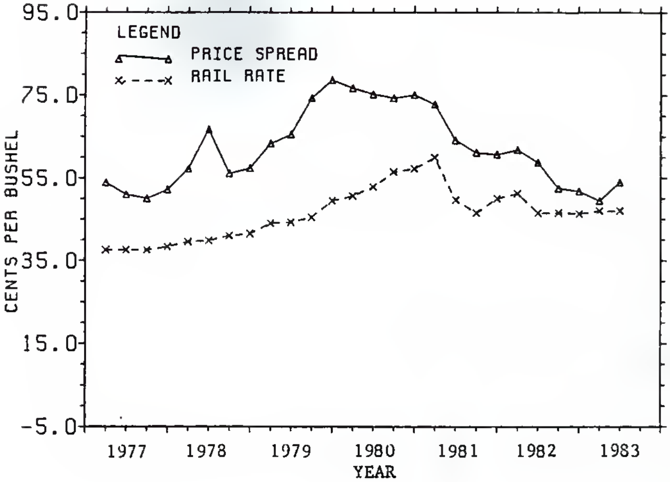
APPENOIX B FIGURE 29
KANSAS CITY-SEWARD PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



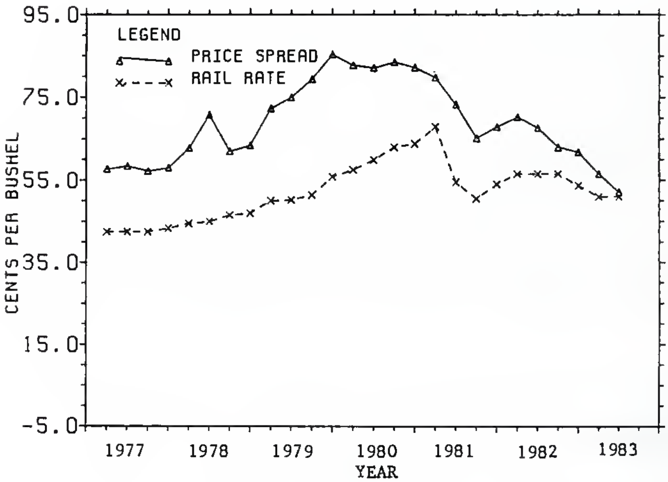
APPENDIX B FIGURE 30
KANSAS CITY-SHAWNEE PRICE SPREAO
BY QUARTER FROM 1977 TO 1983



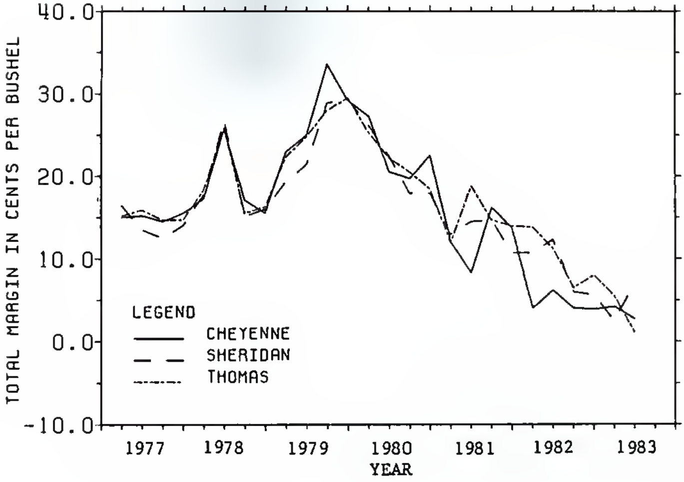
APPENDIX B FIGURE 31
KANSAS CITY-SHERIDAN PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



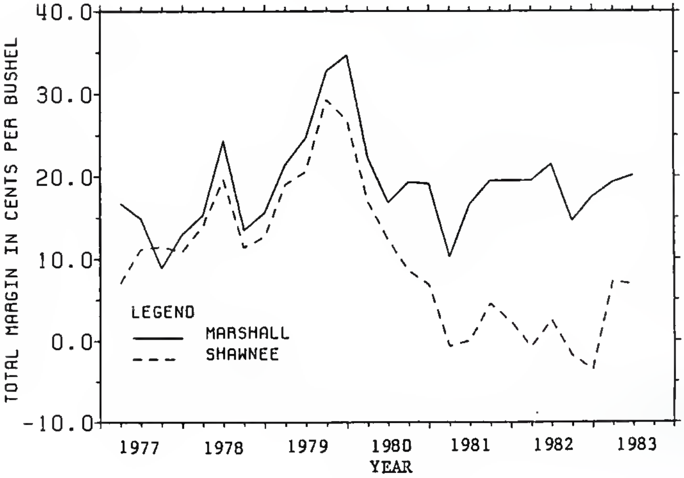
APPENDIX B FIGURE 32
KANSAS CITY-THOMAS PRICE SPREAD
BY QUARTER FROM 1977 TO 1983



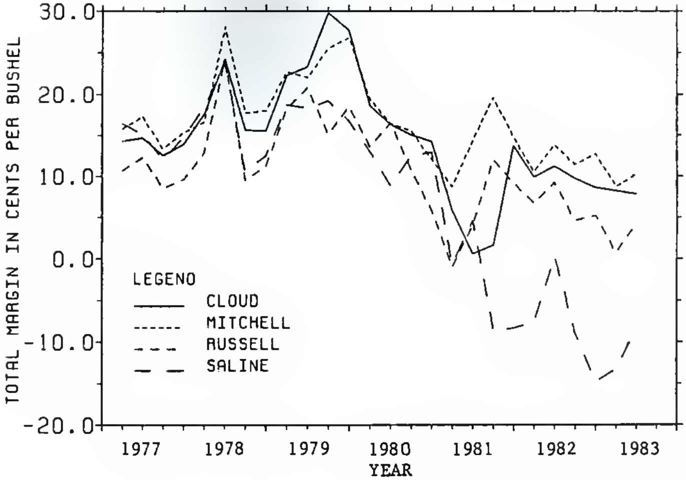
APPENDIX B FIGURE 33
NORTHWEST'S KC-LOCAL TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



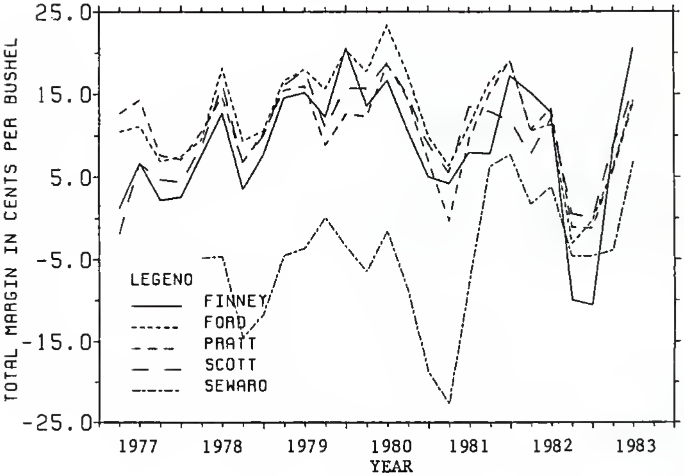
APPENDIX B FIGURE 34
NORTHEAST'S KC-LOCAL TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



APPENDIX B FIGURE 35
CENTRAL'S KC-LOCAL TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



APPENDIX B FIGURE 36
SOUTHWEST'S KC-LOCAL TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



APPENDIX C TABLE 1. ANOVA Table and Means for the Maximum Total Margin

ANALYSIS OF VARIANCE PROCEDURE

DEPENDENT VARIABLE: MAXMGMN

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	45	7761.02786310	172.46728585	18.50
ERROR	234	2181.16056548	9.32119900	PR > F
CORRECTED TOTAL	279	9942.18842857		0.0001

R-SQUARE	C.V.	ROOT MSE	MAXMGMN MEAN
0.780616	16.7626	3.05306387	18.21357143

SOURCE	DF	ANOVA SS	F VALUE	PR > F
TIME	1	646.41214881	69.35	0.0001
QT(TIME)	18	3951.38485119	23.55	0.0001
LOC	13	1901.97042857	15.70	0.0001
LOC*TIME	13	1261.26043452	10.41	0.0001

TESTS OF HYPOTHESES USING THE ANOVA MS FOR QT(TIME) AS AN ERROR TERM

SOURCE	DF	ANOVA SS	F VALUE	PR > F
TIME	1	646.41214881	2.94	0.1033

APPENDIX C TABLE 1. (continued)

ANALYSIS OF VARIANCE PROCEDURE

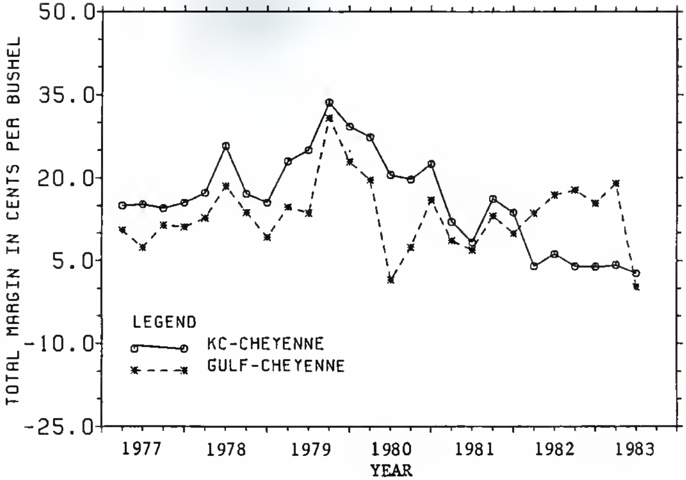
MEANS

LOC	N	MAXMGMN
MITCHELL	20	19.5650000
THOMAS	20	19.7950000
CLOUD	20	18.2100000
FORD	20	19.4850000
FINNEY	20	19.9800000
SHERIDAN	20	18.4600000
SEWARD	20	21.8250000
MARSHALL	20	21.0050000
SHAWNEE	20	12.4500000
PRATT	20	16.7500000
RUSSELL	20	14.8150000
SCOTT	20	18.8450000
CHEYENNE	20	19.5850000
SALINE	20	14.2200000

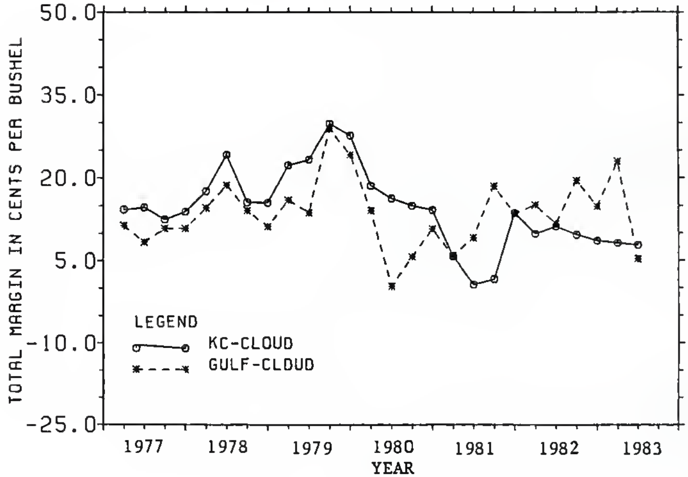
TIME	N	MAXMGMN
1	168	19.4541667
2	112	16.3526786

LOC	TIME	N	MAXMGMN
MITCHELL	1	12	20.0666667
	2	8	18.8125000
THOMAS	1	12	22.3500000
	2	8	15.9625000
CLOUD	1	12	20.0083333
	2	8	15.5125000
FORD	1	12	18.8166667
	2	8	20.4875000
FINNEY	1	12	19.6333333
	2	8	20.5000000
SHERIDAN	1	12	21.5750000
	2	8	13.7875000
SEWARD	1	12	22.0916667
	2	8	21.4250000
MARSHALL	1	12	21.6583333
	2	8	20.0250000
SHAWNEE	1	12	16.5000000
	2	8	6.3750000
PRATT	1	12	15.0666667
	2	8	19.2750000
RUSSELL	1	12	16.2666667
	2	8	12.6375000
SCOTT	1	12	18.0750000
	2	8	20.0000000
CHEYENNE	1	12	23.0333333
	2	8	14.4125000
SALINE	1	12	17.2166667
	2	8	9.7250000

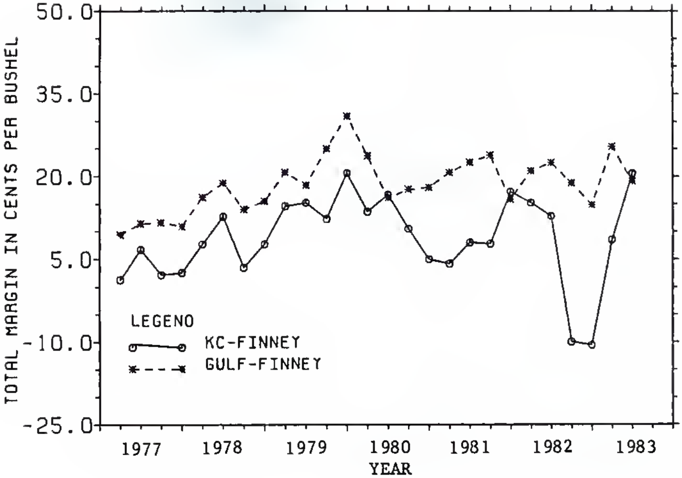
APPENDIX C FIGURE 1
CHEYENNE'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



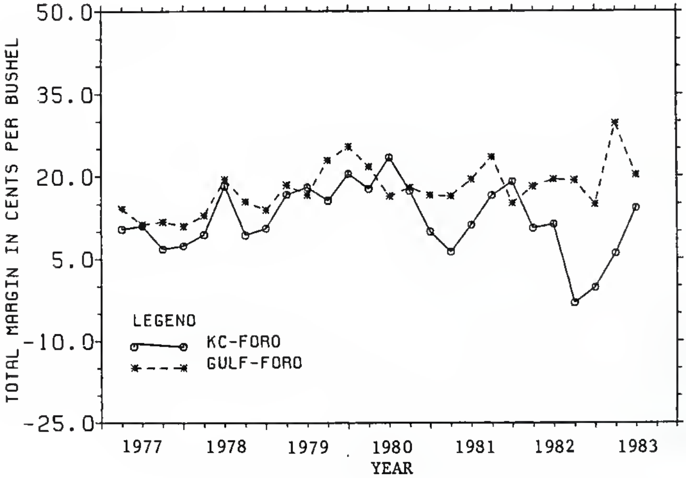
APPENDIX C FIGURE 2
CLOUD'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



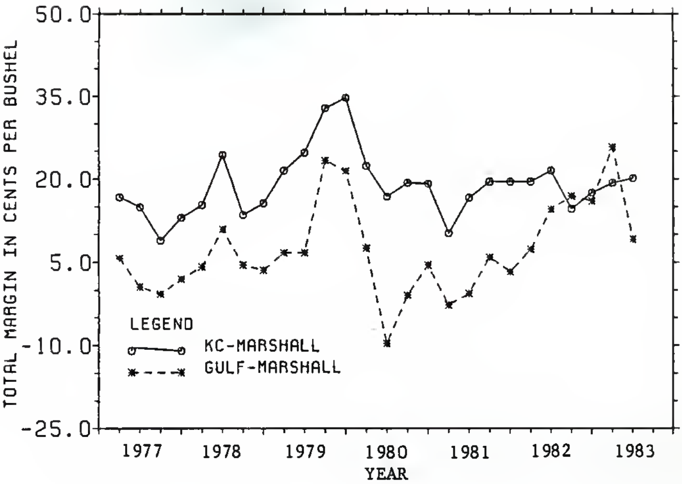
APPENDIX C FIGURE 3
FINNEY'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



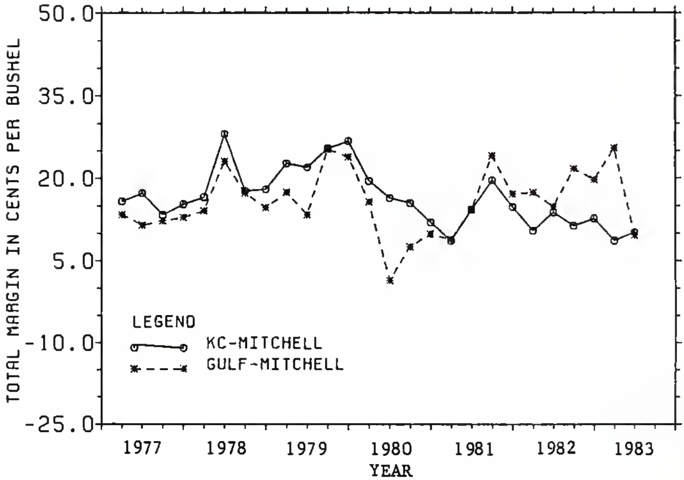
APPENDIX C FIGURE 4
FORD'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



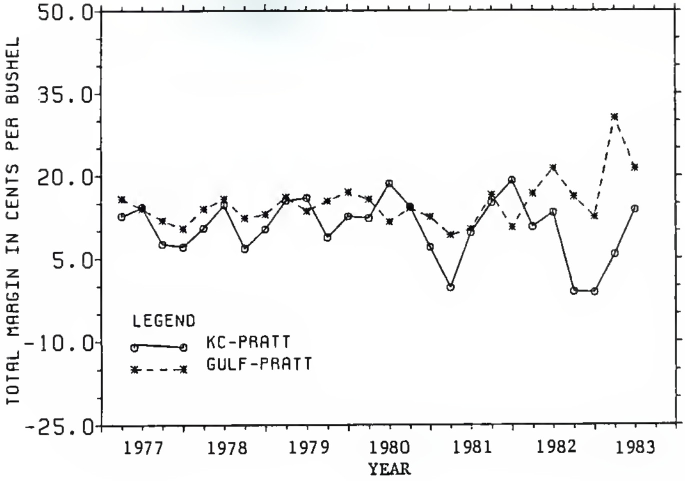
APPENDIX C FIGURE 5
MARSHALL'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



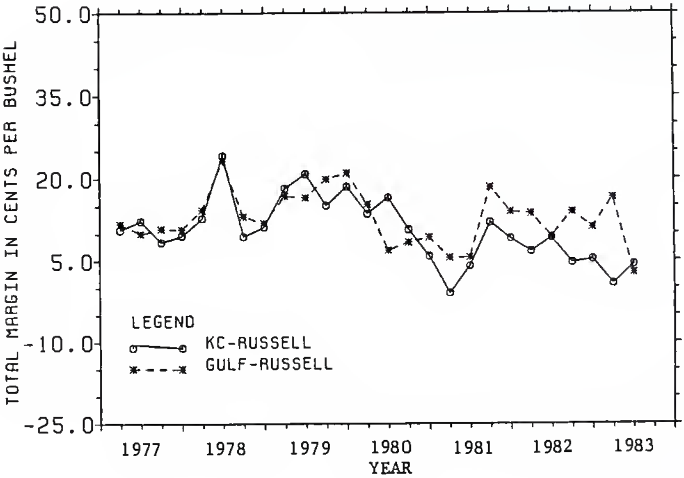
APPENDIX C FIGURE 6
MITCHELL'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



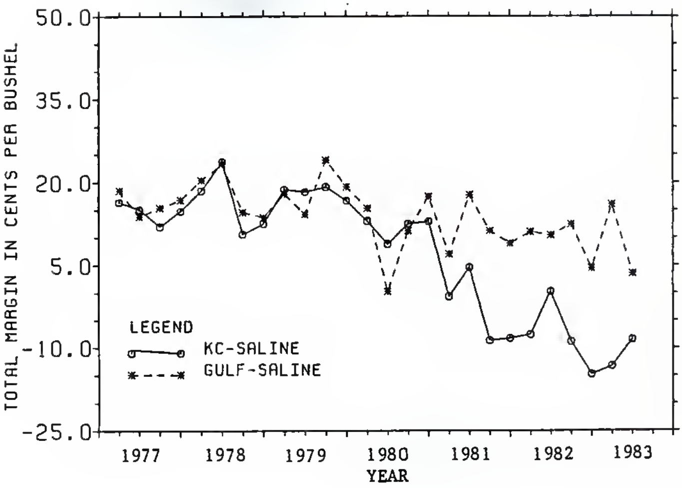
APPENDIX C FIGURE 7
PRATT'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



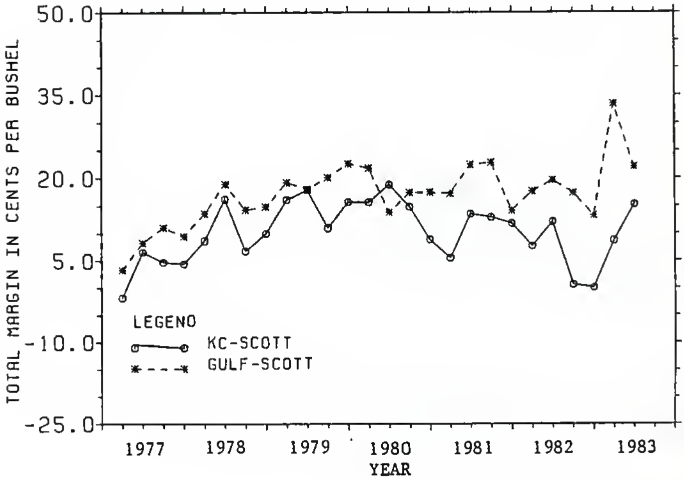
APPENDIX C FIGURE 8
RUSSELL'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



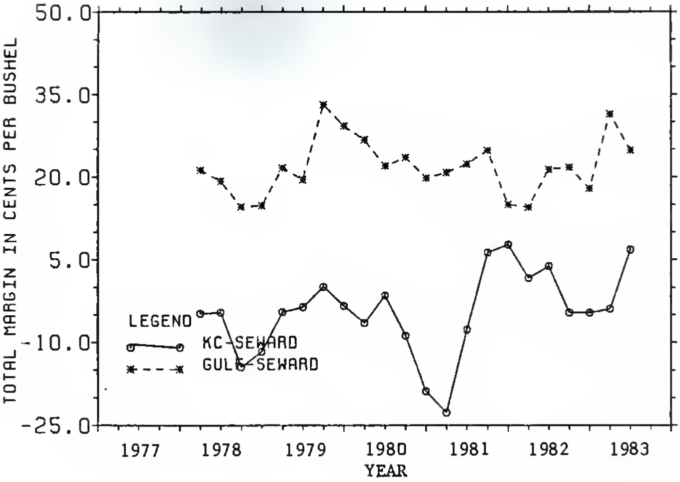
APPENOIX C FIGURE 9
SALINE'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



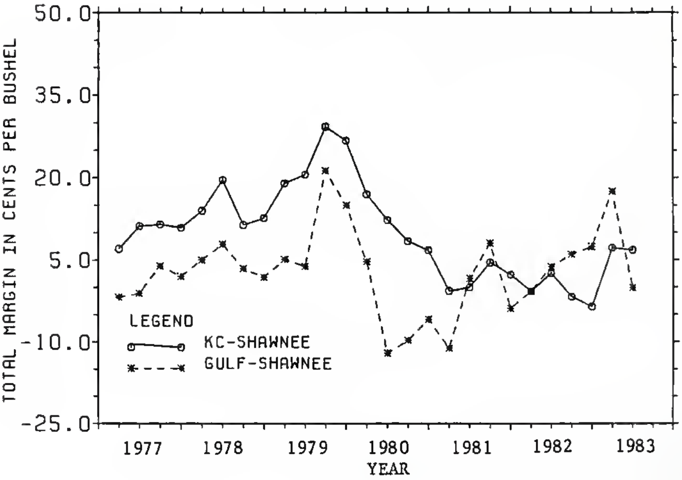
APPENOIX C FIGURE 10
SCOTT'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



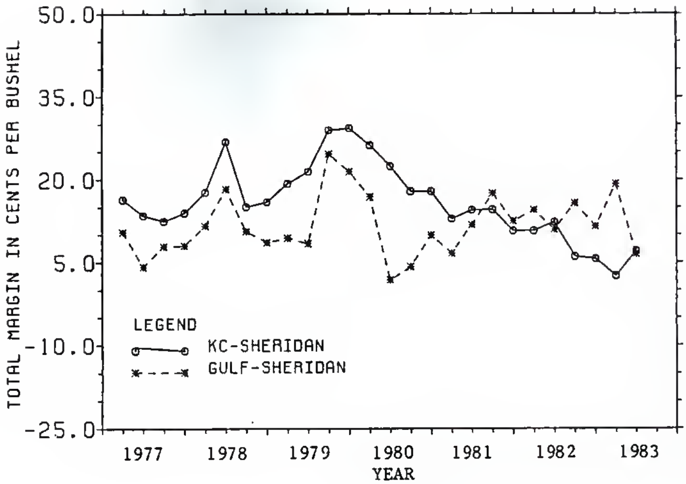
APPENDIX C FIGURE 11
SEWARD'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



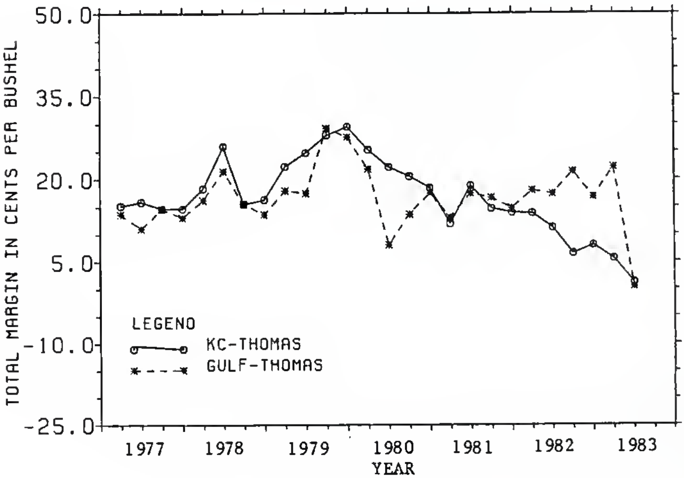
APPENDIX C FIGURE 12
SHAWNEE'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



APPENDIX C FIGURE 13
SHERIDAN'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



APPENDIX C FIGURE 14
THOMAS'S KC & GULF TOTAL MARGINS
BY QUARTER FROM 1977 TO 1983



APPENDIX D TABLE 1. Quarterly Gulf-Kansas City Price Spread

OBS	CROPYEAR	CYRQTR	GULFKC	GFKCPCT	GFKCSD	GKCSDPCT
1	1977	1	27.4	102.6	1.1	40.7
2	1977	2	26.6	99.6	3.6	133.3
3	1977	3	27.5	103.0	2.8	103.7
4	1977	4	25.3	94.8	3.4	125.9
5	1978	1	30.5	110.1	0.7	20.6
6	1978	2	28.0	101.1	3.8	111.8
7	1978	3	27.6	99.6	4.4	129.4
8	1978	4	24.7	89.2	4.8	141.2
9	1979	1	34.6	102.1	1.0	26.3
10	1979	2	36.3	107.1	5.0	131.6
11	1979	3	37.2	109.7	4.0	105.3
12	1979	4	27.4	80.8	5.1	134.2
13	1980	1	36.8	87.4	5.5	87.3
14	1980	2	43.1	102.4	4.8	76.2
15	1980	3	48.5	115.2	7.0	111.1
16	1980	4	39.8	94.5	7.8	123.8
17	1981	1	42.4	113.7	8.4	113.5
18	1981	2	37.8	101.3	6.8	91.9
19	1981	3	38.6	103.5	4.2	56.8
20	1981	4	30.2	81.0	10.3	139.2
21	1982	1	41.3	113.8	5.2	82.5
22	1982	2	38.5	106.1	4.9	77.8
23	1982	3	41.3	113.8	5.9	93.7
24	1982	4	24.0	66.1	9.2	146.0

APPENDIX D TABLE 2. ANOVA Table for Test of Seasonality in the Mean Gulf-Kansas City Price Spread

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: GFKCPCT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	1993.21458333	664.40486111	9.89	0.0003	0.597455	8.1995
ERROR	20	1342.96166667	67.14808333		ROOT MSE		GFKCPCT MEAN
CORRECTED TOTAL	23	3336.17625000			8.19439341		99.93750000

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
CYROTR	3	1993.21458333	9.89	0.0003	3	1993.21458333	9.89	0.0003

GENERAL LINEAR MODELS PROCEDURE

LEAST SQUARES MEANS

CYRQTR	GFKCPCT LSMEAN	STD ERR LSMEAN	PROB > |T| HO:LSMEAN=0	PROB > |T| HO: LSMEAN(I)=LSMEAN(J) I/J	1	2	3	4
1	104.950000	3.345347	0.0001	1	.	0.6745	0.6006	0.0003
2	102.933333	3.345347	0.0001	2	0.6745	.	0.3494	0.0009
3	107.466667	3.345347	0.0001	3	0.6006	0.3494	.	0.0001
4	84.400000	3.345347	0.0001	4	0.0003	0.0009	0.0001	.

APPENDIX D TABLE 3. ANOVA Table for Test of Seasonality in the Gulf-Kansas City Price Spread Variability

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: GKCSOPCT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	16203.34166667	5401.11388889	7.85	0.0012	0.540732	26.1904
ERROR	20	13762.21666667	688.11083333		ROOT MSE		GKCSOPCT MEAN
CORRECTED TOTAL	23	29965.55833333			26.23186675		100.15833333

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
CYRQTR	3	16203.34166667	7.85	0.0012	3	16203.34166667	7.85	0.0012

GENERAL LINEAR MODELS PROCEDURE

LEAST SQUARES MEANS

CYRQTR	GKCSOPCT LSMEAN	STD ERR LSMEAN	PROB > |T| HO:LSMEAN=0	PROB > |T| HO: LSMEAN(I)=LSMEAN(J) I/J	1	2	3	4
1	61.816667	10.709115	0.0001	1	.	0.0118	0.0203	0.0001
2	103.766667	10.709115	0.0001	2	0.0118	.	0.8061	0.0521
3	100.000000	10.709115	0.0001	3	0.0203	0.8061	.	0.0314
4	135.050000	10.709115	0.0001	4	0.0001	0.0521	0.0314	.

APPENDIX D TABLE 4. Truck Discount Regression Data and Statistical Analysis

OBS	CROPYEAR	TRKDISC	TIME	CYRQTR	LH1980	CY1981	CY1982
1	1976	9.7	1	3	0	0	0
2	1976	10.9	2	4	0	0	0
3	1977	9.2	3	1	0	0	0
4	1977	11.8	4	2	0	0	0
5	1977	14.2	5	3	0	0	0
6	1977	15.0	6	4	0	0	0
7	1978	7.2	7	1	0	0	0
8	1978	7.3	8	2	0	0	0
9	1978	14.2	9	3	0	0	0
10	1978	12.0	10	4	0	0	0
11	1979	10.5	11	1	0	0	0
12	1979	19.6	12	2	0	0	0
13	1979	13.4	13	3	0	0	0
14	1979	15.8	14	4	0	0	0
15	1980	12.5	15	1	0	0	0
16	1980	12.7	16	2	0	0	0
17	1980	10.6	17	3	1	0	0
18	1980	9.2	18	4	1	0	0
19	1981	5.2	19	1	0	1	0
20	1981	4.8	20	2	0	1	0
21	1981	5.9	21	3	0	1	0
22	1981	9.2	22	4	0	1	0
23	1982	0.2	23	1	0	0	1
24	1982	3.2	24	2	0	0	1
25	1982	3.7	25	3	0	0	1
26	1982	4.1	26	4	0	0	1

APPENDIX D TABLE 4. (continued)

DEPENDENT VARIABLE = TRKDISC

ORDINARY LEAST SQUARES ESTIMATES

VARIABLE	DF	B VALUE
INTERCPT	1	6.843376
TIME	1	0.3090382
CYRGTR	1	1.11192
LM1980	1	-6.24326
CY1981	1	-9.68346
CY1982	1	-14.3946

ESTIMATES OF AUTOCORRELATIONS

```
LAG  COVARIANCE  CORRELATION  -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1

 0     4.10957     1.000000   |                    |********************|
 1    -0.318633   -0.077704   |                  **|                    |
 2    -0.747922   -0.182395   |                ****|                    |
 3     0.212649    0.051858   |                    |*                   |
 4    -2.09657    -0.511287   |          **********|                    |
```

PARTIAL AUTOCORRELATIONS

1	0.077704
2	0.189577
3	-0.021151
4	0.563033

PRELIMINARY MSE= 2.682509

ESTIMATES OF THE AUTOREGRESSIVE PARAMETERS

LAG	COEFFICIENT	STD DEVIATION	T RATIO
1	0.07651703	0.162077	0.472102
2	0.25325545	0.162673	1.802749
3	0.02863560	0.162673	0.176031
4	0.56303264	0.162077	3.473855

SSE	66.62057
DFE	16
MSE	4.163785
ROOT MSE	2.040536
R-SQUARE	0.9389

VARIABLE	DF	B VALUE	STD DEVIATION	T RATIO	APPROX PROB
INTERCPT	1	6.4407514590	1.05129070007	6.127	0.0001
TIME	1	0.3407076555	0.07657149957	4.450	0.0304
CYRGTR	1	1.2023369930	0.29022098804	4.143	0.0008
LM1980	1	-7.3871693	1.90648141431	-3.875	0.0013
CY1981	1	-10.059213	1.30707698848	-7.696	0.0001
CY1982	1	-15.060765	1.66972437479	-9.020	0.0001

APPENDIX E TABLE 1. Multiple Regression Results for Models Explaining the Maximum Total Margin

MODEL ONE

OEP VARIABLE: MAXMG

SOURCE	OF	SUM OF SQUARES	MEAN SOUARE	F VALUE	PROB>F
MOOEL	18	885.737	49.207636	3.519	0.0001
ERROR	65	908.979	13.984285		
C TOTAL	83	1794.716			

ROUT MSE	3.739557	R-SQUARE	0.4935
OEP MEAN	17.351786	AOJ R-SO	0.3533
C.V.	21.55142		

VARIABLE	OF	PARAMETER ESTIMATE	STANOARO ERROR	T FOR HO: PARAMETER=0	PROB > |T|
INTERCEP	1	53.507445	30.088675	1.778	0.0800
PROT	1	-1.986398	1.032813	-1.923	0.0588
CELEV	1	-0.178108	1.066753	-0.167	0.8679
KSUTIL	1	-37.671407	10.537906	-3.575	0.0007
KSMOVM	1	-6.956166	38.486955	-0.181	0.8571
OMY	1	-1.010182	1.898107	-0.532	0.5964
CHEYENNE	1	2.568622	2.552266	1.006	0.3180
CLOUO	1	3.108733	2.534790	1.226	0.2245
FINNEY	1	5.741235	2.191721	2.620	0.0109
FORO	1	4.046915	3.294996	1.228	0.2238
MARSHALL	1	6.532459	2.646190	2.469	0.0162
MITCHELL	1	5.101620	2.587551	1.972	0.0529
PRATT	1	1.772140	2.522331	0.703	0.4848
RUSSELL	1	0.380560	2.592365	0.147	0.8837
SCOTT	1	3.792617	2.245618	1.689	0.0960
SEWARO	1	8.368987	2.277388	3.675	0.0005
SHAWNEE	1	-2.744138	2.606089	-1.053	0.2963
SHERIOAN	1	3.999267	2.552891	1.567	0.1221
THOMAS	1	2.852625	2.564429	1.112	0.2701

MODEL TWO

OEP VARIABLE: MAXMG

SOURCE	OF	SUM OF SQUARES	MEAN SOUARE	F VALUE	PROB>F
MOOEL	18	860.542	47.807902	3.326	0.0002
ERROR	65	934.174	14.371904		
C TOTAL	83	1794.716			

ROOT MSE	3.791029	R-SOUARE	0.4755
OEP MEAN	17.351786	AOJ R-SO	0.3353
C.V.	21.84806		

VARIABLE	OF	PARAMETER ESTIMATE	STANOARO ERROR	T FOR HO: PARAMETER=0	PROB > |T|
INTERCEP	1	-8.583590	13.163530	-0.682	0.4974
PNPREM	1	0.370414	0.272615	1.359	0.1789
CELEV	1	-0.509415	1.072792	-0.475	0.6365
KSUTIL	1	-31.876544	9.814392	-3.248	0.0018
KSMOVM	1	71.980168	28.004560	2.570	0.0125
OMY	1	2.886888	1.787446	1.615	0.1111
CHEYENNE	1	4.099569	2.540105	1.614	0.1114
CLOUO	1	1.747463	2.539257	0.688	0.4938
FINNEY	1	4.775245	2.208999	2.162	0.0343
FORO	1	3.446726	3.323667	1.037	0.3036
MARSHALL	1	3.671608	2.652183	1.384	0.1710
MITCHELL	1	2.791383	2.612790	1.068	0.2893
PRATT	1	0.777892	2.524312	0.308	0.7589
RUSSELL	1	-1.777577	2.580296	-0.689	0.4933
SCOTT	1	3.791278	2.276713	1.665	0.1007
SEWARO	1	6.885850	2.250990	3.059	0.0032
SHAWNEE	1	-3.667351	2.618047	-1.401	0.1660
SHERIOAN	1	2.676191	2.525609	1.060	0.2932
THOMAS	1	4.837089	2.503953	1.932	0.0577

APPENDIX E TABLE 2. Data for Multiple Regressions on the Maximum Total Margin

OBS	CROPYR	LOCATION	MAXNG	PROT	PNPREM	CELEV	KSUTIL	KSNOVH	DNY	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1	77	CHEYENNE	18.250	11.1	0.10	0.0	0.37	0.44	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2	77	CLOUD	17.050	12.8	7.30	0.0	0.37	0.44	0	0	1	0	0	0	0	0	0	0	0	0	0	0
3	77	FINNEY	14.375	12.4	4.00	0.0	0.37	0.44	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4	77	FORD	13.775	11.8	1.70	0.0	0.37	0.44	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5	77	MARSHALL	15.375	13.8	11.60	0.0	0.37	0.44	0	0	0	0	0	1	0	0	0	0	0	0	0	0
6	77	MITCHELL	18.350	12.8	7.30	0.0	0.37	0.44	0	0	0	0	0	0	1	0	0	0	0	0	0	0
7	77	PRATT	13.025	12.4	4.00	0.0	0.37	0.44	0	0	0	0	0	0	0	1	0	0	0	0	0	0
8	77	RUSSELL	15.050	12.8	7.30	0.0	0.37	0.44	0	0	0	0	0	0	0	0	1	0	0	0	0	0
9	77	SALINE	19.075	12.7	5.80	0.0	0.37	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	77	SCOTT	13.275	12.2	2.90	0.0	0.37	0.44	0	0	0	0	0	0	0	0	0	1	0	0	0	0
11	77	SEWARD	20.200	12.5	5.80	0.0	0.37	0.44	0	0	0	0	0	0	0	0	0	0	1	0	0	0
12	77	SHAWNEE	14.000	12.2	2.90	0.0	0.37	0.44	0	0	0	0	0	0	0	0	0	0	0	1	0	0
13	77	SHERIDAN	17.750	12.6	5.80	0.0	0.37	0.44	0	0	0	0	0	0	0	0	0	0	0	0	1	0
14	77	THOMAS	18.400	11.5	1.00	0.0	0.37	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15	78	CHEYENNE	20.150	11.4	0.00	0.0	0.26	0.47	0	1	0	0	0	0	0	0	0	0	0	0	0	0
16	78	CLOUD	19.175	12.1	0.60	0.0	0.26	0.47	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17	78	FINNEY	17.150	12.0	0.60	0.5	0.26	0.47	0	0	0	1	0	0	0	0	0	0	0	0	0	0
18	78	FORD	16.425	12.6	1.60	-1.0	0.26	0.47	0	0	0	0	1	0	0	0	0	0	0	0	0	0
19	78	MARSHALL	18.825	13.0	3.20	0.0	0.26	0.47	0	0	0	0	0	1	0	0	0	0	0	0	0	0
20	78	MITCHELL	20.100	12.0	0.60	0.0	0.26	0.47	0	0	0	0	0	0	1	0	0	0	0	0	0	0
21	78	PRATT	14.350	12.1	0.60	0.0	0.26	0.47	0	0	0	0	0	0	0	1	0	0	0	0	0	0
22	78	RUSSELL	16.300	12.4	0.80	0.0	0.26	0.47	0	0	0	0	0	0	0	0	1	0	0	0	0	0
23	78	SALINE	16.325	11.2	0.00	0.0	0.26	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	78	SCOTT	16.575	12.0	0.60	0.0	0.26	0.47	0	0	0	0	0	0	0	0	0	1	0	0	0	0
25	78	SEWARD	17.625	13.5	3.30	0.5	0.26	0.47	0	0	0	0	0	0	0	0	0	0	1	0	0	0
26	78	SHAWNEE	15.925	12.6	1.60	-0.5	0.26	0.47	0	0	0	0	0	0	0	0	0	0	0	1	0	0
27	78	SHERIDAN	17.950	12.2	0.60	0.0	0.26	0.47	0	0	0	0	0	0	0	0	0	0	0	0	1	0
28	78	THOMAS	19.725	10.9	0.00	0.0	0.26	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	1
29	79	CHEYENNE	27.650	12.0	2.10	0.0	0.26	0.47	0	1	0	0	0	0	0	0	0	0	0	0	0	0
30	79	CLOUD	23.100	12.1	2.10	0.0	0.26	0.47	0	0	1	0	0	0	0	0	0	0	0	0	0	0
31	79	FINNEY	24.100	12.5	5.60	1.0	0.26	0.47	0	0	0	1	0	0	0	0	0	0	0	0	0	0
32	79	FORD	23.350	11.8	0.60	-1.0	0.26	0.47	0	0	0	0	1	0	0	0	0	0	0	0	0	0
33	79	MARSHALL	26.650	12.5	5.62	0.0	0.26	0.47	0	0	0	0	0	1	0	0	0	0	0	0	0	0
34	79	MITCHELL	22.050	12.8	8.00	0.0	0.26	0.47	0	0	0	0	0	0	1	0	0	0	0	0	0	0
35	79	PRATT	16.675	12.1	2.10	0.0	0.26	0.47	0	0	0	0	0	0	0	1	0	0	0	0	0	0
36	79	RUSSELL	18.175	12.7	5.60	0.0	0.26	0.47	0	0	0	0	0	0	0	0	1	0	0	0	0	0
37	79	SALINE	16.825	11.6	0.60	1.0	0.26	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	79	SCOTT	20.825	12.3	3.00	0.5	0.26	0.47	0	0	0	0	0	0	0	0	0	1	0	0	0	0
39	79	SEWARD	27.725	11.9	1.00	1.0	0.26	0.47	0	0	0	0	0	0	0	0	0	0	1	0	0	0
40	79	SHAWNEE	21.350	11.5	0.60	-0.5	0.26	0.47	0	0	0	0	0	0	0	0	0	0	0	1	0	0
41	79	SHERIDAN	26.700	11.8	1.00	0.0	0.26	0.47	0	0	0	0	0	0	0	0	0	0	0	0	1	0
42	79	THOMAS	26.550	11.2	0.20	0.0	0.26	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	1
43	80	CHEYENNE	15.625	11.3	0.10	0.0	0.32	0.46	0	1	0	0	0	0	0	0	0	0	0	0	0	0
44	80	CLOUD	11.075	12.5	2.90	0.0	0.32	0.46	0	0	1	0	0	0	0	0	0	0	0	0	0	0
45	80	FINNEY	19.725	12.4	1.30	1.0	0.32	0.46	0	0	0	1	0	0	0	0	0	0	0	0	0	0
46	80	FORD	17.550	12.1	1.20	-1.5	0.32	0.46	0	0	0	0	1	0	0	0	0	0	0	0	0	0
47	80	MARSHALL	16.300	13.2	4.50	0.0	0.32	0.46	0	0	0	0	0	1	0	0	0	0	0	0	0	0
48	80	MITCHELL	12.675	12.8	4.20	0.0	0.32	0.46	0	0	0	0	0	0	1	0	0	0	0	0	0	0
49	80	PRATT	11.660	12.5	2.00	0.0	0.32	0.46	0	0	0	0	0	0	0	1	0	0	0	0	0	0

APPENDIX E TABLE 2. (continued)

OOS	CROPYR	LOCATION	MAXMG	PROT	PNPREH	CELEV	KSUTIL	KSHOVM	OHY	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
50	80	RUSSELL	7.775	13.1	4.5	0.0	0.32	0.46	0	0	0	0	0	0	0	0	1	0	0	0	0	0
51	80	SALINE	13.625	12.3	1.3	2.0	0.32	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	80	SCOTT	18.600	12.0	1.2	1.0	0.32	0.46	0	0	0	0	0	0	0	0	0	1	0	0	0	0
53	00	SEWARD	21.600	12.5	2.0	1.0	0.32	0.46	0	0	0	0	0	0	0	0	0	0	1	0	0	0
54	80	SHAWNEE	4.050	12.6	2.0	-0.5	0.32	0.46	0	0	0	0	0	0	0	0	0	0	0	1	0	0
55	80	SHERIDAN	15.800	12.3	1.3	0.0	0.32	0.46	0	0	0	0	0	0	0	0	0	0	0	0	1	0
56	00	THOMAS	17.700	12.2	0.1	0.0	0.32	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	1
57	81	CHEYENNE	15.100	11.9	-0.1	0.0	0.28	0.39	1	1	0	0	0	0	0	0	0	0	0	0	0	0
58	81	CLOUD	14.750	13.5	3.0	0.0	0.20	0.39	1	0	1	0	0	0	0	0	0	0	0	0	0	0
59	81	FINNEY	21.125	14.0	3.8	1.5	0.28	0.39	1	0	0	1	0	0	0	0	0	0	0	0	0	0
60	01	FORD	20.000	13.2	2.3	-1.5	0.28	0.39	1	0	0	0	1	0	0	0	0	0	0	0	0	0
61	81	MARSHALL	20.000	13.0	2.3	0.0	0.28	0.39	1	0	0	0	0	1	0	0	0	0	0	0	0	0
62	01	MITCHELL	18.350	13.0	3.3	0.0	0.28	0.39	1	0	0	0	0	0	1	0	0	0	0	0	0	0
63	01	PRATT	18.425	13.4	2.5	0.0	0.20	0.39	1	0	0	0	0	0	0	1	0	0	0	0	0	0
64	01	RUSSELL	13.850	13.6	3.0	0.0	0.28	0.39	1	0	0	0	0	0	0	0	1	0	0	0	0	0
65	81	SALINE	10.375	13.4	2.5	2.0	0.28	0.39	1	0	0	0	0	0	0	0	0	0	0	0	0	0
66	81	SCOTT	18.525	12.7	1.0	1.0	0.28	0.39	1	0	0	0	0	0	0	0	0	1	0	0	0	0
67	01	SEWARD	18.900	13.7	3.0	1.0	0.28	0.39	1	0	0	0	0	0	0	0	0	0	1	0	0	0
68	81	SHAWNEE	3.325	12.7	1.0	-0.5	0.28	0.39	1	0	0	0	0	0	0	0	0	0	0	1	0	0
69	81	SHERIDAN	14.200	14.7	3.8	0.0	0.28	0.39	1	0	0	0	0	0	0	0	0	0	0	0	1	0
70	01	THOMAS	16.625	11.5	-0.1	0.0	0.28	0.39	1	0	0	0	0	0	0	0	0	0	0	0	0	1
71	82	CHEYENNE	13.725	10.6	0.0	0.0	0.36	0.44	1	1	0	0	0	0	0	0	0	0	0	0	0	0
72	82	CLOUD	16.275	11.5	0.8	0.0	0.36	0.44	1	0	1	0	0	0	0	0	0	0	0	0	0	0
73	92	FINNEY	19.875	11.1	0.0	2.0	0.36	0.44	1	0	0	1	0	0	0	0	0	0	0	0	0	0
74	02	FORD	20.975	11.3	0.0	-2.0	0.36	0.44	1	0	0	0	1	0	0	0	0	0	0	0	0	0
75	02	MARSHALL	20.050	11.4	0.0	0.0	0.36	0.44	1	0	0	0	0	1	0	0	0	0	0	0	0	0
76	82	MITCHELL	19.275	11.6	0.8	0.0	0.36	0.44	1	0	0	0	0	0	1	0	0	0	0	0	0	0
77	82	PRATT	20.125	11.6	0.8	0.0	0.36	0.44	1	0	0	0	0	0	0	1	0	0	0	0	0	0
78	82	RUSSELL	11.425	11.3	0.0	0.0	0.36	0.44	1	0	0	0	0	0	0	0	1	0	0	0	0	0
79	82	SALINE	9.075	11.4	0.0	2.0	0.26	0.44	1	0	0	0	0	0	0	0	0	0	0	0	0	0
80	82	SCOTT	21.475	11.1	0.0	1.0	0.36	0.44	1	0	0	0	0	0	0	0	0	1	0	0	0	0
81	82	SEWARD	23.950	11.5	0.8	1.0	0.26	0.44	1	0	0	0	0	0	0	0	0	0	1	0	0	0
82	82	SHAWNEE	9.425	12.1	4.0	1.0	0.36	0.44	1	0	0	0	0	0	0	0	0	0	0	1	0	0
83	82	SHERIDAN	13.375	11.4	0.0	0.0	0.36	0.44	1	0	0	0	0	0	0	0	0	0	0	0	1	0
84	82	THOMAS	15.300	10.9	0.0	0.5	0.36	0.44	1	0	0	0	0	0	0	0	0	0	0	0	0	1

APPENDIX F

WEEKLY PRICE DATA

YEAR	WEEK	GF_BASIS	GULFBID	KC_CASH	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1977	1	18	2.9075	2.6875	2.12	2.26	2.23	2.21	2.29	2.22	2.21	2.26	2.25	2.32	.	2.43	2.17	2.12
1977	2	20	2.9750	2.7350	2.14	2.30	2.30	2.25	2.37	2.28	2.25	2.28	2.28	2.35	.	2.48	2.21	2.16
1977	3	21	2.9500	2.7000	2.10	2.26	2.26	2.22	2.31	2.24	2.22	2.24	2.23	2.31	.	2.44	2.16	2.12
1977	4	25	2.9675	2.7075	2.10	2.25	2.26	2.23	2.30	2.23	2.22	2.25	2.22	2.31	.	2.43	2.14	2.12
1977	5	30	2.9925	2.6925	2.11	2.26	2.27	2.25	2.30	2.24	2.24	2.26	2.22	2.30	.	2.43	2.13	2.13
1977	6	24	3.0050	2.7450	2.15	2.32	2.28	2.26	2.37	2.29	2.26	2.28	2.27	2.32	.	2.50	2.21	2.16
1977	7	22	2.9900	2.7500	2.16	2.34	2.27	2.25	2.36	2.30	2.25	2.28	2.28	2.31	.	2.49	2.22	2.17
1977	8	24	3.0250	2.7650	2.17	2.36	2.31	2.27	2.39	2.32	2.30	2.31	2.31	2.35	.	2.52	2.24	2.18
1977	9	19	2.9325	2.6525	2.05	2.24	2.22	2.19	2.27	2.20	2.20	2.21	2.18	2.26	.	2.40	2.12	2.09
1977	10	23	3.0125	2.7425	2.09	2.28	2.27	2.27	2.31	2.25	2.27	2.28	2.23	2.31	.	2.45	2.17	2.16
1977	11	21	2.9350	2.6650	2.04	2.23	2.21	2.21	2.26	2.19	2.21	2.21	2.18	2.25	.	2.40	2.12	2.09
1977	12	20	2.9050	2.6250	2.04	2.22	2.18	2.20	2.27	2.16	2.18	2.19	2.17	2.22	.	2.37	2.09	2.06
1977	13	18	2.8175	2.5575	1.96	2.14	2.07	2.10	2.20	2.09	2.08	2.10	2.11	2.12	.	2.29	2.04	1.97
1977	14	17	2.7425	2.5125	1.91	2.09	2.01	2.04	2.16	2.04	2.01	2.05	2.05	2.06	.	2.21	1.98	1.92
1977	15	22	2.8250	2.5450	1.95	2.14	2.08	2.07	2.19	2.08	2.08	2.11	2.10	2.10	.	2.24	2.02	1.97
1977	16	24	2.8400	2.5600	1.96	2.14	2.09	2.12	2.19	2.09	2.09	2.11	2.10	2.11	.	2.26	2.03	1.98
1977	17	23	2.6850	2.4250	1.83	2.01	1.96	1.97	2.07	1.96	1.97	1.98	1.99	1.95	.	2.12	1.93	1.86
1977	18	15	2.6350	2.4850	1.83	1.98	1.90	1.95	2.04	1.93	1.90	1.94	1.96	1.92	.	2.09	1.91	1.83
1977	19	15	2.5650	2.3350	1.73	1.91	1.83	1.85	1.96	1.86	1.84	1.87	1.88	1.86	.	2.06	1.83	1.76
1977	20	17	2.5950	2.3650	1.76	1.92	1.85	1.89	1.99	1.88	1.86	1.88	1.91	1.87	.	2.09	1.86	1.78
1977	21	19	2.5900	2.3400	1.75	1.92	1.86	1.90	1.97	1.87	1.86	1.88	1.89	1.87	.	2.08	1.34	1.76
1977	22	15	2.5375	2.3275	1.75	1.90	1.79	1.84	1.95	1.85	1.81	1.87	1.88	1.87	.	2.06	1.84	1.75
1977	23	11	2.4425	2.2725	1.67	1.83	1.71	1.76	1.89	1.79	1.72	1.80	1.82	1.74	.	1.95	1.77	1.68
1977	24	12	2.4525	2.2625	1.65	1.82	1.75	1.77	1.88	1.79	1.85	1.80	1.81	1.74	.	1.96	1.77	1.69
1977	25	20	2.5400	2.3200	1.73	1.90	1.82	1.85	1.95	1.86	1.86	1.84	1.87	1.78	.	2.01	1.84	1.75
1977	26	23	2.6425	2.3925	1.80	1.97	1.90	1.94	2.11	1.93	1.95	1.93	1.96	1.89	.	2.09	1.89	1.83
1977	27	25	2.6350	2.3650	1.77	1.94	1.90	1.92	2.10	1.94	1.95	1.93	1.93	1.92	.	2.06	1.87	1.79
1977	28	23	2.6350	2.3750	1.78	1.96	1.90	1.92	2.09	1.94	1.95	1.94	1.93	1.92	.	2.04	1.88	1.80
1977	29	27	2.6300	2.3600	1.77	1.94	1.90	1.94	2.07	1.92	1.94	1.93	1.94	1.89	.	2.06	1.87	1.78
1977	30	27	2.5850	2.3150	1.72	1.92	1.85	1.88	2.05	1.87	1.89	1.88	1.90	1.84	.	2.01	1.82	1.74
1977	31	29	2.6200	2.3300	1.74	1.94	1.89	1.90	2.04	1.89	1.92	1.91	1.91	1.87	.	2.03	1.84	1.78
1977	32	27	2.5875	2.3175	1.73	1.92	1.85	1.89	2.05	1.87	1.89	1.89	1.90	1.84	.	2.02	1.83	1.73
1977	33	28	2.5700	2.2900	1.70	1.89	1.84	1.86	1.98	1.86	1.88	1.87	1.87	1.83	.	1.99	1.80	1.72
1977	34	31	2.6200	2.3300	1.73	1.92	1.95	1.92	2.01	1.91	1.93	1.92	1.92	1.87	.	2.04	1.83	1.77
1977	35	32	2.6250	2.3450	1.74	1.92	1.89	1.92	2.02	1.91	1.93	1.92	1.92	1.90	.	2.04	1.82	1.78
1977	36	27	2.6750	2.3950	1.79	1.98	1.93	1.97	2.08	1.96	1.97	1.96	1.97	1.92	.	2.09	1.88	1.82
1977	37	23	2.7100	2.4600	1.86	2.05	1.98	2.00	2.10	2.01	2.02	2.02	2.03	1.95	.	2.15	1.97	1.88
1977	38	25	2.8225	2.5525	1.95	2.13	2.08	2.09	2.19	2.10	2.12	2.11	2.12	2.05	.	2.25	2.04	1.97
1977	39	24	2.7825	2.5025	1.92	2.10	2.04	2.08	2.14	2.05	2.08	2.07	2.07	2.00	.	2.19	1.99	1.94
1977	40	24	2.8500	2.5700	1.97	2.17	2.12	2.14	2.20	2.11	2.16	2.14	2.12	2.07	.	2.26	2.06	2.00
1977	41	23	2.7650	2.4950	1.90	2.08	2.04	2.05	2.14	2.02	2.08	2.05	2.04	2.01	.	2.17	1.99	1.90
1977	42	28	2.8400	2.5600	2.00	2.15	2.12	2.14	2.21	2.12	2.16	2.14	2.11	2.10	.	2.27	2.07	2.01
1977	43	29	2.9125	2.7025	2.02	2.19	2.15	2.18	2.28	2.18	2.19	2.17	2.16	2.15	.	2.33	2.10	2.03
1977	44	28	2.9875	2.7275	2.10	2.31	2.25	2.28	2.40	2.28	2.29	2.28	2.28	2.25	.	2.44	2.23	2.15
1977	45	30	3.0300	2.7700	2.15	2.34	2.29	2.31	2.43	2.32	2.34	2.31	2.33	2.29	.	2.48	2.27	2.19
1977	46	32	3.1725	2.9125	2.31	2.48	2.44	2.44	2.58	2.46	2.49	2.46	2.45	2.43	.	2.62	2.41	2.33
1977	47	32	3.0875	2.8275	2.25	2.44	2.40	2.40	2.53	2.40	2.46	2.42	2.41	2.39	.	2.57	2.35	2.30
1977	48	27	2.9950	2.8150	2.19	2.40	2.35	2.36	2.48	2.33	2.42	2.38	2.37	2.35	.	2.52	2.29	2.27
1977	49	39	3.1300	2.8200	2.19	2.39	2.35	2.40	2.49	2.35	2.40	2.39	2.36	2.35	.	2.51	2.27	2.25

YEAR	WEEK	GF_BASIS	GULFBIO	KC_CASH	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1977	50	42	3.0975	2.7975	2.15	2.35	2.32	2.38	2.42	2.32	2.37	2.35	2.32	2.33	.	2.47	2.23	2.22
1977	51	40	3.1100	2.8200	2.19	2.37	2.32	2.38	2.43	2.35	2.38	2.36	2.35	2.35	.	2.51	2.27	2.22
1977	52	37	3.1850	2.8850	2.29	2.45	2.39	2.45	2.50	2.43	2.45	2.42	2.44	2.43	.	2.61	2.37	2.29
1978	1	34	3.1075	2.8275	2.23	2.40	2.34	2.39	2.47	2.40	2.40	2.41	2.39	2.34	2.41	2.57	2.31	2.24
1978	2	26	3.0350	2.8350	2.25	2.42	2.35	2.40	2.50	2.42	2.41	2.41	2.39	2.36	2.41	2.56	2.31	2.25
1978	3	35	3.0775	2.7975	2.21	2.37	2.31	2.35	2.46	2.37	2.37	2.36	2.34	2.32	2.44	2.52	2.27	2.21
1978	4	37	3.1200	2.8400	2.23	2.42	2.35	2.39	2.50	2.44	2.40	2.41	2.38	2.36	2.42	2.55	2.32	2.26
1978	5	43	3.1375	2.8275	2.21	2.39	2.34	2.39	2.48	2.39	2.39	2.37	2.34	2.36	2.39	2.50	2.29	2.25
1978	6	43	3.1300	2.8300	2.21	2.39	2.34	2.39	2.48	2.39	2.39	2.37	2.34	2.36	2.39	2.50	2.29	2.25
1978	7	46	3.1775	2.8875	2.22	2.43	2.38	2.44	2.55	2.43	2.44	2.42	2.38	2.39	2.44	2.55	2.34	2.30
1978	8	48	3.1400	2.8600	2.24	2.41	2.36	2.42	2.53	2.42	2.42	2.41	2.33	2.35	2.44	2.54	2.34	2.29
1978	9	53	3.1650	2.8950	2.25	2.42	2.35	2.42	2.52	2.38	2.42	2.39	2.36	2.36	2.43	2.54	2.33	2.27
1978	10	54	3.2650	3.0050	2.30	2.49	2.42	2.50	2.59	2.49	2.47	2.45	2.49	2.43	2.51	2.62	2.42	2.38
1978	11	57	3.3525	3.0925	2.37	2.54	2.52	2.56	2.60	2.51	2.57	2.51	2.53	2.46	2.57	2.69	2.47	2.39
1978	12	58	3.4350	3.1750	2.45	2.59	2.51	2.63	2.63	2.56	2.63	2.57	2.63	2.51	2.64	2.75	2.45	2.42
1978	13	58	3.4475	3.1475	2.43	2.56	2.47	2.58	2.67	2.50	2.60	2.53	2.56	2.51	2.59	2.71	2.45	2.35
1978	14	49	3.5875	3.3775	2.56	2.74	2.67	2.76	2.81	2.68	2.81	2.72	2.73	2.68	2.77	2.87	2.59	2.56
1978	15	50	3.6350	3.4150	2.57	2.76	2.70	2.73	2.81	2.66	2.82	2.72	2.73	2.67	2.77	2.88	2.64	2.56
1978	16	40	3.5600	3.3200	2.47	2.74	2.67	2.73	2.80	2.67	2.73	2.68	2.68	2.66	2.81	2.87	2.63	2.56
1978	17	41	3.3550	3.1450	2.30	2.52	2.47	2.48	2.63	2.46	2.53	2.48	2.45	2.45	2.56	2.65	2.44	2.36
1978	18	35	3.2300	2.9800	2.28	2.46	2.40	2.42	2.56	2.41	2.46	2.38	2.40	2.38	2.55	2.60	2.37	2.29
1978	19	35	3.2625	3.0225	2.34	2.51	2.44	2.46	2.55	2.44	2.51	2.43	2.46	2.42	2.59	2.62	2.40	2.33
1978	20	35	3.4200	3.2000	2.50	2.67	2.60	2.63	2.71	2.63	2.66	2.57	2.67	2.58	2.74	2.82	2.58	2.49
1978	21	36	3.4825	3.2425	2.55	2.74	2.69	2.70	2.80	2.67	2.75	2.63	2.73	2.66	2.80	2.90	2.64	2.57
1978	22	40	3.5400	3.2500	2.55	2.74	2.71	2.72	2.86	2.69	2.77	2.59	2.75	2.69	2.80	2.91	2.55	2.59
1978	23	40	3.4650	3.1650	2.48	2.67	2.66	2.65	2.71	2.60	2.73	2.56	2.66	2.62	2.78	2.83	2.51	2.51
1978	24	37	3.3275	3.0475	2.40	2.55	2.54	2.55	2.60	2.50	2.60	2.52	2.55	2.51	2.70	2.70	2.40	2.43
1978	25	40	3.4650	3.1750	2.46	2.66	2.63	2.64	2.70	2.62	2.71	2.64	2.70	2.62	2.78	2.84	2.52	2.53
1978	26	38	3.3975	3.0975	2.42	2.60	2.58	2.61	2.65	2.57	2.65	2.59	2.65	2.56	2.75	2.79	2.50	2.45
1978	27	39	3.5050	3.2050	2.52	2.71	2.69	2.70	2.82	2.68	2.76	2.66	2.73	2.68	2.80	2.86	2.64	2.55
1978	28	38	3.4600	3.1700	2.51	2.68	2.64	2.67	2.82	2.64	2.71	2.67	2.74	2.63	2.77	2.84	2.62	2.52
1978	29	40	3.4125	3.1025	2.42	2.63	2.60	2.62	2.72	2.59	2.66	2.63	2.64	2.58	2.72	2.79	2.56	2.48
1978	30	42	3.4675	3.1675	2.48	2.70	2.66	2.68	2.80	2.65	2.72	2.69	2.73	2.64	2.77	2.83	2.61	2.55
1978	31	43	3.4075	3.0975	2.42	2.63	2.59	2.59	2.71	2.60	2.65	2.62	2.68	2.56	2.72	2.77	2.53	2.48
1978	32	41	3.3800	3.0700	2.40	2.61	2.57	2.60	2.69	2.58	2.63	2.62	2.66	2.53	2.72	2.76	2.52	2.46
1978	33	43	3.4625	3.1525	2.48	2.69	2.65	2.67	2.76	2.65	2.71	2.70	2.72	2.64	2.77	2.83	2.59	2.54
1978	34	45	3.5450	3.2350	2.57	2.75	2.71	2.73	2.84	2.72	2.78	2.77	2.79	2.68	2.83	2.90	2.65	2.60
1978	35	41	3.5175	3.2075	2.58	2.76	2.71	2.73	2.84	2.72	2.77	2.75	2.77	2.68	2.84	2.90	2.66	2.61
1978	36	40	3.5275	3.2275	2.59	2.76	2.71	2.73	2.85	2.72	2.77	2.75	2.79	2.68	2.84	2.93	2.65	2.61
1978	37	40	3.5400	3.2400	2.60	2.79	2.73	2.75	2.85	2.73	2.79	2.77	2.80	2.70	2.85	2.94	2.68	2.63
1978	38	41	3.5650	3.2550	2.61	2.81	2.75	2.78	2.87	2.75	2.81	2.79	2.84	2.73	2.86	2.95	2.69	2.66
1978	39	44	3.6275	3.3175	2.67	2.87	2.81	2.84	2.94	2.82	2.87	2.85	2.89	2.79	2.95	3.00	2.76	2.70
1978	40	44	3.6775	3.3775	2.72	2.92	2.86	2.89	2.99	2.88	2.92	2.90	2.96	2.83	2.98	3.04	2.80	2.75
1978	41	46	3.6900	3.3800	2.73	2.94	2.88	2.91	3.01	2.90	2.94	2.92	2.95	2.84	2.99	3.04	2.82	2.77
1978	42	46	3.7425	3.4425	2.79	3.00	2.93	2.98	3.06	2.94	2.99	2.98	3.02	2.91	3.05	3.11	2.88	2.84
1978	43	46	3.7425	3.5225	2.81	3.00	2.93	2.98	3.08	2.96	2.99	2.98	3.03	2.90	3.06	3.13	2.90	2.84
1978	44	43	3.7425	3.5125	2.85	3.00	2.91	2.97	3.09	2.97	2.97	2.97	3.01	2.90	3.08	3.11	2.90	2.82
1978	45	43	3.7525	3.5025	2.90	3.00	2.92	2.97	3.09	2.98	2.98	2.98	3.02	2.90	3.09	3.13	2.92	2.83
1978	46	42	3.7200	3.4600	2.81	2.97	2.88	2.95	3.06	2.92	2.94	2.94	2.98	2.87	3.05	3.13	2.90	2.79

YEAR	WEEK	GF_BASIS	GULFBID	KC_CASH	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1978	47	44	3.7250	3.4450	2.82	2.99	2.90	2.96	3.06	2.94	2.97	2.96	2.99	2.90	3.05	3.14	2.90	2.82
1978	48	44	3.7325	3.4425	2.84	3.02	2.93	2.97	3.06	2.96	3.00	2.99	3.03	2.94	3.06	3.15	2.91	2.86
1978	49	48	3.7600	3.4100	2.80	3.00	2.88	2.96	3.05	2.96	3.00	2.99	3.03	2.88	3.06	3.13	2.89	2.84
1978	50	46	3.6750	3.3450	2.71	2.91	2.78	2.85	2.98	2.86	2.88	2.89	2.91	2.80	2.92	3.09	2.78	2.75
1978	51	45	3.6750	3.4150	2.72	2.91	2.81	2.85	2.95	2.86	2.88	2.86	2.90	2.79	2.92	3.06	2.80	2.77
1978	52	45	3.6625	3.4025	2.70	2.90	2.80	2.84	2.94	2.85	2.87	2.85	2.89	2.78	2.91	3.05	2.79	2.74
1979	1	47	3.6600	3.3800	2.69	2.88	2.80	2.82	2.94	2.84	2.87	2.85	2.87	2.77	2.89	3.05	2.78	2.71
1979	2	50	3.7100	3.4000	2.71	2.92	2.85	2.89	2.98	2.88	2.92	2.90	2.93	2.83	2.95	3.08	2.84	2.76
1979	3	56	3.8000	3.5100	2.78	2.98	2.89	2.94	3.06	2.94	2.97	2.95	2.98	2.89	3.01	3.11	2.90	2.83
1979	4	58	3.7900	3.5300	2.78	2.98	2.88	2.93	3.08	2.94	2.98	2.94	2.97	2.87	3.00	3.12	2.89	2.83
1979	5	63	3.8200	3.5100	2.78	2.95	2.86	2.94	3.04	2.94	2.99	2.94	2.95	2.86	3.00	3.12	2.89	2.83
1979	6	62	3.8300	3.5600	2.81	2.97	2.87	2.95	3.03	2.95	2.97	2.95	2.97	2.86	3.01	3.15	2.90	2.81
1979	7	60	3.8400	3.5200	2.77	2.98	2.89	2.98	3.08	2.96	2.99	2.96	2.91	2.90	3.02	3.11	2.91	2.84
1979	8	60	3.8700	3.5400	2.81	2.99	2.89	2.99	3.07	2.98	2.99	2.97	3.00	2.91	3.04	3.14	2.92	2.82
1979	9	58	3.8500	3.5400	2.80	2.97	2.88	2.97	3.13	2.97	2.98	2.96	3.04	2.89	3.03	3.13	2.91	2.81
1979	10	56	3.8600	3.5800	2.79	3.00	2.89	2.94	3.10	2.99	2.99	2.97	3.07	2.88	3.04	3.12	2.92	2.85
1979	11	62	3.7900	3.5600	2.73	2.94	2.86	2.91	3.00	2.94	2.95	2.92	3.00	2.84	3.03	3.10	2.89	2.76
1979	12	60	3.8100	3.5900	2.77	2.99	2.87	2.95	3.02	2.96	2.98	2.94	3.04	2.88	3.03	3.13	2.93	2.76
1979	13	56	3.7700	3.5900	2.78	3.00	2.85	2.90	3.10	2.95	2.96	2.93	3.03	2.84	3.00	3.12	2.90	2.80
1979	14	55	3.7300	3.5600	2.76	2.95	2.81	2.89	3.01	2.90	2.92	2.88	2.97	2.80	2.98	3.07	2.87	2.76
1979	15	56	3.7800	3.6000	2.79	2.99	2.86	2.94	3.07	2.96	2.98	2.92	3.04	2.85	3.00	3.12	2.90	2.81
1979	16	59	3.8300	3.6200	2.80	3.00	2.90	2.96	3.11	2.97	3.02	2.95	3.04	2.88	3.07	3.16	2.95	2.85
1979	17	55	3.8700	3.6000	2.79	3.03	2.93	3.00	3.10	3.01	3.07	3.00	3.12	2.93	3.11	3.16	2.98	2.89
1979	18	46	4.0100	3.7500	2.95	3.13	3.04	3.11	3.21	3.15	3.13	3.09	3.19	3.04	3.18	3.33	3.09	2.96
1979	19	43	3.9400	3.6900	2.92	3.17	3.06	3.10	3.22	3.15	3.14	3.11	3.18	3.03	3.17	3.36	3.10	2.97
1979	20	40	3.9300	3.7100	2.96	3.16	3.05	3.10	3.22	3.17	3.13	3.11	3.18	3.03	3.17	3.30	3.06	2.96
1979	21	37	3.9000	3.6800	2.91	3.12	3.02	3.09	3.13	3.11	3.10	3.07	3.17	3.01	3.10	3.25	3.02	2.92
1979	22	37	3.9000	3.6700	2.91	3.15	3.01	3.07	3.15	3.13	3.09	3.09	3.18	3.00	3.12	3.27	3.03	2.93
1979	23	41	4.1400	3.8700	3.10	3.32	3.22	3.27	3.39	3.32	3.31	3.26	3.34	3.19	3.38	3.42	3.21	3.12
1979	24	36	4.3800	4.0900	3.34	3.56	3.49	3.53	3.62	3.56	3.58	3.52	3.53	3.45	3.62	3.69	3.43	3.37
1979	25	36	4.6500	4.3500	3.60	3.82	3.75	3.79	3.88	3.84	3.85	3.78	3.77	3.72	3.88	3.94	3.69	3.62
1979	26	46	4.9300	4.5900	3.85	4.00	4.01	4.04	4.06	4.04	4.09	4.01	4.07	4.03	4.10	4.15	3.93	3.87
1979	27	49	4.7000	4.3700	3.55	3.75	3.76	3.77	3.93	3.78	3.86	3.80	3.83	3.76	3.81	3.90	3.66	3.63
1979	28	43	4.8600	4.5100	3.65	3.88	3.86	3.89	3.98	3.92	4.02	3.97	3.97	3.51	3.93	4.05	3.78	3.77
1979	29	48	4.8600	4.5300	3.65	3.91	3.92	3.95	3.99	3.96	4.03	3.97	4.00	3.94	3.99	4.06	3.85	3.84
1979	30	50	4.6600	4.3100	3.46	3.71	3.71	3.74	3.78	3.73	3.82	3.76	3.78	3.72	3.81	3.82	3.61	3.55
1979	31	49	4.5300	4.1800	3.33	3.54	3.55	3.59	3.60	3.57	3.66	3.60	3.62	3.55	3.63	3.67	3.45	3.39
1979	32	45	4.4600	4.1300	3.26	3.47	3.47	3.53	3.52	3.50	3.59	3.53	3.55	3.48	3.58	3.58	3.32	3.26
1979	33	51	4.6500	4.3000	3.41	3.67	3.68	3.72	3.68	3.69	3.80	3.74	3.75	3.71	3.69	3.76	3.52	3.48
1979	34	56	4.7500	4.4000	3.46	3.78	3.79	3.81	3.75	3.77	3.91	3.85	3.83	3.80	3.82	3.86	3.67	3.58
1979	35	55	4.7600	4.4200	3.49	3.77	3.79	3.82	3.78	3.79	3.92	3.86	3.85	3.81	3.82	3.87	3.68	3.60
1979	36	45	4.6000	4.2500	3.36	3.59	3.62	3.67	3.63	3.64	3.77	3.69	3.70	3.65	3.65	3.71	3.52	3.44
1979	37	54	4.8775	4.5275	3.65	3.87	3.83	3.94	3.90	3.89	4.03	3.96	3.98	3.89	3.91	3.98	3.79	3.71
1979	38	53	4.8100	4.4500	3.60	3.80	3.69	3.85	3.82	3.79	3.93	3.87	3.90	3.78	3.82	3.90	3.70	3.63
1979	39	57	4.9000	4.5400	3.62	3.83	3.78	3.90	3.88	3.84	3.99	3.91	3.93	3.81	3.86	3.95	3.71	3.72
1979	40	51	4.9375	4.5775	3.69	3.86	3.78	3.93	3.95	3.86	4.00	3.93	3.93	3.85	3.90	3.96	3.79	3.75
1979	41	52	4.7850	4.4150	3.51	3.74	3.66	3.78	3.80	3.71	3.86	3.76	3.80	3.70	3.78	3.82	3.61	3.53
1979	42	57	4.9225	4.5025	3.60	3.85	3.79	3.88	3.91	3.84	3.98	3.90	3.92	3.82	3.88	3.91	3.71	3.67
1979	43	53	4.7925	4.3825	3.51	3.75	3.67	3.76	3.77	3.75	3.86	3.80	3.88	3.75	3.82	3.87	3.68	3.58

YEAR	WEEK	GF_BASIS	GULFBID	KC_CASH	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1979	44	57	4.7600	4.4400	3.58	3.77	3.65	3.74	3.76	3.75	3.85	3.79	3.91	3.73	3.36	3.90	3.69	2.57
1979	45	55	4.7675	4.4875	3.62	3.80	3.65	3.75	3.80	3.82	3.84	3.82	3.95	3.74	3.57	3.92	3.72	3.57
1979	46	54	4.8800	4.5600	3.71	3.88	3.73	3.83	3.87	3.90	3.94	3.86	4.00	3.83	3.94	4.07	3.75	3.66
1979	47	54	4.9400	4.6200	3.73	3.92	3.74	3.89	3.93	3.93	4.03	3.92	4.03	3.87	3.99	4.14	3.78	3.72
1979	48	51	4.9275	4.5775	3.67	3.89	3.74	3.87	3.91	3.89	3.98	3.91	3.98	3.83	3.97	4.07	3.73	3.70
1979	49	56	4.9125	4.4425	3.64	3.87	3.76	3.85	3.86	3.86	3.95	3.86	3.92	3.80	3.96	4.05	3.70	3.70
1979	50	47	4.9075	4.5275	3.60	3.90	3.78	3.83	3.88	3.89	3.93	3.90	3.98	3.79	3.95	4.07	3.74	3.67
1979	51	42	4.8975	4.5375	3.64	3.95	3.76	3.84	3.95	3.91	3.92	3.93	4.01	3.80	3.96	4.07	3.74	3.70
1979	52	41	4.9150	4.5550	3.68	3.97	3.79	3.85	3.93	3.90	3.97	3.93	4.00	3.82	3.97	4.07	3.76	3.71
1980	1	47	4.9175	4.4475	3.54	3.86	3.70	3.79	3.89	3.82	3.86	3.84	3.89	3.74	3.87	3.98	3.64	3.60
1980	2	.	.	4.0325	3.07	3.45	3.27	3.31	3.43	3.40	3.38	3.40	3.48	3.25	3.45	3.60	3.22	3.12
1980	3	25	4.7000	4.3700	3.49	3.81	3.66	3.72	3.84	3.77	3.80	3.79	3.84	3.68	3.82	3.94	3.61	3.54
1980	4	32	4.7700	4.4500	3.56	3.86	3.70	3.77	3.90	3.82	3.83	3.83	3.89	3.72	3.87	3.98	3.67	3.59
1980	5	30	4.7725	4.4225	3.55	3.84	3.66	3.75	3.89	3.80	3.79	3.79	3.86	3.69	3.84	3.95	3.65	3.57
1980	6	28	4.7600	4.4100	3.52	3.85	3.64	3.69	3.90	3.82	3.82	3.80	3.87	3.64	3.80	3.95	3.65	3.58
1980	7	32	4.6800	4.3200	3.42	3.75	3.59	3.64	3.80	3.72	3.71	3.68	3.77	3.57	3.69	3.87	3.55	3.48
1980	8	35	4.6950	4.3250	3.43	3.75	3.62	3.67	3.80	3.73	3.74	3.71	3.77	3.60	3.72	3.89	3.56	3.51
1980	9	40	4.6800	4.2700	3.39	3.70	3.61	3.66	3.75	3.70	3.73	3.70	3.73	3.59	3.72	3.87	3.53	3.50
1980	10	22	4.6800	4.3100	3.45	3.74	3.61	3.66	3.82	3.73	3.73	3.69	3.84	3.57	3.73	3.92	3.54	3.50
1980	11	22	4.5275	4.1475	3.30	3.58	3.46	3.51	3.65	3.56	3.59	3.64	3.62	3.42	3.58	3.76	3.41	3.36
1980	12	25	4.4900	4.0900	3.26	3.55	3.39	3.45	3.60	3.49	3.53	3.49	3.57	3.35	3.53	3.71	3.35	3.30
1980	13	20	4.3300	3.9800	3.16	3.43	3.23	3.31	2.49	3.38	3.39	3.37	3.45	3.24	3.35	3.62	3.22	3.17
1980	14	23	4.1900	3.8400	2.98	3.28	3.10	3.16	3.35	3.24	3.23	3.20	3.30	3.09	3.19	3.44	3.05	3.03
1980	15	26	4.4400	4.1200	3.27	3.56	3.36	3.44	3.63	3.51	3.50	3.47	3.57	3.33	3.48	3.70	3.35	3.30
1980	16	25	4.1900	3.9300	3.10	3.35	3.20	3.17	3.43	3.32	3.26	3.26	3.39	3.08	3.29	3.50	3.18	3.13
1980	17	29	4.1800	3.9300	3.05	3.35	3.17	3.16	3.42	3.32	3.21	3.28	3.44	3.14	3.24	3.57	3.16	3.11
1980	18	34	4.2200	3.9000	3.09	3.35	3.17	3.17	3.42	3.33	3.24	3.28	3.45	3.16	3.28	3.57	3.16	3.11
1980	19	21	4.5200	4.2100	3.39	3.62	3.43	3.45	3.69	3.61	3.53	3.52	3.73	3.44	3.58	3.83	3.43	3.35
1980	20	22	4.4300	4.1100	3.31	3.56	3.36	3.37	3.65	3.54	3.47	3.46	3.66	3.37	3.50	3.75	3.37	3.29
1980	21	18	4.3700	4.0900	3.26	3.53	3.32	3.32	3.63	3.50	3.43	3.43	3.50	3.32	3.44	3.69	3.34	3.25
1980	22	22	4.3900	4.0900	3.24	3.55	3.30	3.33	3.63	3.50	3.42	3.45	3.58	3.30	3.45	3.67	3.36	3.26
1980	23	22	4.2700	4.0700	3.18	3.50	3.22	3.28	3.59	3.46	3.34	3.38	3.57	3.24	3.35	3.65	3.33	3.22
1980	24	22	4.2500	4.0300	3.20	3.48	3.20	3.27	3.57	3.43	3.31	3.35	3.44	3.22	3.31	3.62	3.29	3.22
1980	25	23	4.3100	4.0700	3.24	3.52	3.22	3.35	3.61	3.50	3.35	3.50	3.55	3.28	3.37	3.70	3.33	3.26
1980	26	19	4.4500	4.2600	3.44	3.69	3.45	3.52	3.76	3.68	3.58	3.57	3.75	3.45	3.54	3.91	3.52	3.45
1980	27	26	4.5300	4.2800	3.44	3.70	3.49	3.50	3.78	3.67	3.60	3.61	3.61	3.47	3.59	3.92	3.57	3.47
1980	28	17	4.4000	4.1000	3.29	3.55	3.36	3.40	3.62	3.54	3.44	3.45	3.47	3.32	3.44	3.75	3.40	3.32
1980	29	25	4.5800	4.2100	3.36	3.63	3.45	3.49	3.68	3.61	3.56	3.59	3.66	3.43	3.59	3.88	3.46	3.38
1980	30	30	4.7000	4.2900	3.42	3.71	3.53	3.60	3.76	3.69	3.65	3.65	3.64	3.53	3.67	3.93	3.55	3.46
1980	31	29	4.6800	4.3100	3.42	3.73	3.53	3.59	3.78	3.70	3.63	3.65	3.75	3.52	3.65	3.95	3.56	3.48
1990	32	25	4.7100	4.3600	3.52	3.80	3.61	3.67	3.87	3.76	3.72	3.75	3.81	3.60	3.72	4.00	3.64	3.54
1980	33	22	4.7600	4.3800	3.49	3.79	3.58	3.64	3.83	3.74	3.69	3.78	3.78	3.55	3.73	3.99	3.62	3.52
1980	34	30	4.7000	4.3200	3.46	3.75	3.54	3.57	3.79	3.71	3.62	3.74	3.74	3.52	3.69	3.92	3.58	3.48
1980	35	27	4.6500	4.3400	3.44	3.73	3.55	3.57	3.77	3.70	3.61	3.70	3.76	3.51	3.69	3.95	3.59	3.46
1980	36	10	4.8500	4.4800	3.56	3.89	3.71	3.74	3.93	3.85	3.80	3.85	3.92	3.68	3.81	4.09	3.72	3.62
1950	37	14	4.8700	4.4400	3.56	3.89	3.74	3.77	3.93	3.85	3.85	3.86	3.93	3.70	3.87	4.10	3.69	3.62
1980	38	18	4.9300	4.4900	3.60	3.93	3.78	3.86	3.97	3.88	3.89	3.88	3.93	3.76	3.92	4.11	3.73	3.65
1980	39	13	5.0500	4.6300	3.76	4.05	3.90	3.97	4.10	4.00	4.00	4.03	4.08	3.87	4.07	4.27	3.86	3.78
1980	40	14	4.9800	4.6000	3.67	4.02	3.91	3.95	4.07	3.98	4.03	4.03	4.06	3.85	4.06	4.21	3.84	3.80

YEAR	WEEK	GF_BASIS	GULFBIO	KC_CASH	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1980	41	24	5.0900	4.630	3.70	4.02	3.92	4.01	4.08	4.01	4.05	4.03	4.05	3.90	4.09	4.24	3.85	3.80
1980	42	19	5.1700	4.680	3.82	4.14	4.02	4.13	4.19	4.25	4.13	4.13	4.18	4.02	4.23	4.36	3.96	3.90
1980	43	20	5.3000	4.930	4.00	4.32	4.18	4.26	4.40	4.35	4.27	4.28	4.31	4.16	4.34	4.55	4.16	4.04
1980	44	21	5.2550	4.905	4.00	4.33	4.18	4.28	4.39	4.31	4.30	4.30	4.35	4.16	4.36	4.56	4.16	4.07
1980	45	30	5.3700	4.960	4.08	4.38	4.22	4.30	4.44	4.35	4.37	4.32	4.38	4.19	4.42	4.61	4.21	4.11
1980	46	41	5.3800	4.900	4.00	4.33	4.21	4.27	4.38	4.33	4.32	4.36	4.33	4.19	4.41	4.55	4.17	4.11
1980	47	38	5.3500	4.950	4.04	4.38	4.19	4.26	4.42	4.35	4.30	4.42	4.38	4.18	4.40	4.58	4.19	4.10
1980	48	40	5.2500	4.850	3.96	4.28	4.09	4.14	4.33	4.25	4.20	4.30	4.28	4.08	4.28	4.50	4.10	4.01
1980	49	21	5.2000	4.780	3.85	4.17	4.05	4.10	4.23	4.18	4.17	4.23	4.18	4.04	4.23	4.42	4.03	3.94
1980	50	28	4.8600	4.380	3.51	3.85	3.72	3.76	3.88	3.84	3.83	3.83	3.77	3.69	3.88	4.08	3.65	3.61
1980	51	36	5.0800	4.600	3.70	4.06	3.93	3.97	4.06	4.04	4.05	4.02	3.94	3.93	4.05	4.26	3.87	3.82
1980	52	34	4.9500	4.500	3.56	3.92	3.78	3.83	3.94	3.89	3.92	3.89	3.83	3.77	3.92	4.14	3.72	3.67
1980	53	34	5.1200	4.680	3.72	4.08	3.94	3.99	4.12	4.05	4.09	4.06	4.01	3.92	4.09	4.32	3.88	3.83
1981	1	39	5.2000	4.640	3.79	4.15	4.00	4.06	4.21	4.11	4.18	4.12	4.10	3.97	4.17	4.41	3.94	3.89
1981	2	43	5.2500	4.680	3.85	4.19	3.99	4.07	4.24	4.10	4.13	4.12	4.15	4.04	4.14	4.42	3.95	3.88
1981	3	42	5.1600	4.630	3.77	4.10	3.92	3.98	4.16	4.05	4.07	4.05	4.06	3.91	4.11	4.33	3.88	3.81
1981	4	45	4.9800	4.420	3.61	3.93	3.76	3.82	3.98	3.88	3.91	3.88	3.87	3.74	3.94	4.15	3.69	3.65
1981	5	45	5.0000	4.470	3.61	3.95	3.78	3.86	4.02	3.90	3.93	4.00	3.91	3.78	3.97	4.19	3.73	3.67
1981	6	45	4.8900	4.400	3.56	3.86	3.66	3.75	3.93	3.80	3.86	3.89	3.95	3.68	3.85	4.10	3.67	3.55
1981	7	47	4.9500	4.440	3.59	3.91	3.73	3.79	3.99	3.88	3.93	3.97	3.99	3.71	3.93	4.14	3.73	3.62
1981	8	50	4.9500	4.500	3.63	3.95	3.73	3.82	4.02	3.91	3.91	3.92	4.04	3.74	3.95	4.17	3.77	3.63
1981	9	37	4.7300	4.220	3.39	3.73	3.51	3.61	3.79	3.69	3.70	3.70	3.83	3.53	3.74	3.95	3.53	3.41
1981	10	35	4.6700	4.220	3.37	3.72	3.45	3.55	3.77	3.65	3.63	3.70	3.80	3.45	3.68	3.92	3.50	3.43
1981	11	37	4.8000	4.390	3.53	3.87	3.57	3.70	3.93	3.82	3.84	3.82	3.99	3.58	3.80	4.08	3.65	3.60
1981	12	36	4.7800	4.400	3.60	3.88	3.57	3.72	3.94	3.81	3.80	3.81	3.99	3.58	3.79	4.10	3.67	3.70
1981	13	42	4.7900	4.430	3.58	3.88	3.55	3.70	3.93	3.91	3.80	3.80	3.96	3.58	3.79	4.10	3.66	3.62
1981	14	42	4.8700	4.500	3.70	3.98	3.67	3.78	4.00	3.92	3.85	3.92	3.96	3.68	3.86	4.15	3.77	3.70
1981	15	48	4.8800	4.430	3.63	3.94	3.71	3.75	3.95	3.87	3.83	3.85	3.92	3.68	3.85	4.10	3.71	3.64
1981	16	59	5.0700	4.520	3.69	4.02	3.93	4.00	4.05	3.97	4.06	3.97	4.00	3.90	4.04	4.22	3.83	3.75
1981	17	47	4.7900	4.380	3.60	3.84	3.63	3.72	3.77	3.79	3.80	3.83	3.83	3.62	3.75	4.10	3.71	3.60
1981	18	33	4.8200	4.360	3.63	3.85	3.70	3.79	3.93	3.82	3.87	3.92	3.85	3.67	3.81	4.09	3.70	3.62
1981	19	33	4.6700	4.180	3.51	3.74	3.53	3.63	3.82	3.68	3.74	3.84	3.73	3.54	3.66	3.99	3.57	3.51
1981	20	36	4.6800	4.380	3.58	3.91	3.53	3.62	4.00	3.84	3.70	3.92	3.85	3.55	3.63	4.07	3.78	3.68
1981	21	35	4.6600	4.350	3.63	3.92	3.58	3.66	3.99	3.85	3.70	3.98	3.93	3.56	3.62	4.05	3.73	3.64
1981	22	32	4.5650	4.290	3.51	3.87	3.52	3.58	3.88	3.79	3.67	3.87	3.88	3.53	3.59	4.04	3.67	3.56
1981	23	33	4.6725	4.270	3.62	3.92	3.59	3.69	3.88	3.90	3.74	4.00	4.02	3.61	3.71	4.06	3.69	3.52
1981	24	36	4.6350	4.260	3.65	3.90	3.57	3.71	3.95	3.83	3.72	3.92	3.97	3.62	3.65	4.03	3.72	3.54
1981	25	38	4.5150	4.140	3.42	3.75	3.49	3.57	3.83	3.76	3.62	3.80	3.81	3.47	3.55	3.89	3.49	3.40
1981	26	25	4.5400	4.130	3.42	3.71	3.49	3.56	3.83	3.60	3.61	3.70	3.92	3.48	3.55	3.89	3.49	3.50
1981	27	30	4.7325	4.340	3.62	3.87	3.66	3.71	3.93	3.83	3.80	3.81	4.10	3.68	3.74	4.05	3.68	3.68
1981	28	25	4.5300	4.170	3.47	3.71	3.44	3.50	3.80	3.57	3.62	3.67	3.89	3.50	3.52	3.87	3.53	3.56
1981	29	23	4.5700	4.230	3.51	3.76	3.51	3.58	3.84	3.72	3.67	3.73	4.02	3.53	3.57	3.95	3.61	3.59
1981	30	22	4.5475	4.230	3.48	3.76	3.45	3.56	3.82	3.72	3.69	3.75	4.00	3.50	3.58	3.93	3.60	3.54
1981	31	21	4.4950	4.200	3.37	3.70	3.46	3.49	3.76	3.65	3.67	3.72	3.95	3.44	3.53	3.85	3.56	3.50
1981	32	34	4.6375	4.190	3.33	3.70	3.48	3.60	3.75	3.64	3.65	3.69	3.98	3.56	3.63	3.85	3.56	3.52
1981	33	50	4.7000	4.140	3.42	3.74	3.59	3.63	3.76	3.69	3.75	3.74	3.94	3.57	3.67	3.92	3.57	3.52
1981	34	54	4.6125	4.080	3.37	3.69	3.52	3.55	3.69	3.63	3.68	3.67	3.90	3.49	3.60	3.88	3.54	3.46
1981	35	34	4.6100	4.090	3.35	3.69	3.50	3.55	3.70	3.63	3.66	3.64	3.88	3.48	3.58	3.88	3.50	3.42
1981	35	36	4.6450	4.190	3.46	3.75	3.54	3.59	3.78	3.70	3.72	3.71	3.98	3.54	3.63	3.92	3.59	3.52

YEAR	WEEK	GF_BASIS	GULFBID	KC_CASH	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1981	37	36	4.6675	4.21	3.48	3.75	3.56	3.60	3.80	3.71	3.72	3.71	3.96	3.55	3.66	4.00	3.59	3.51
1981	38	35	4.6775	4.22	3.50	3.77	3.54	3.60	3.82	3.73	3.72	3.83	3.98	3.56	3.64	4.01	3.61	3.64
1981	39	31	4.6125	4.23	3.45	3.77	3.52	3.56	3.81	3.72	3.66	3.74	3.98	3.49	3.59	3.95	3.64	3.59
1981	40	25	4.5550	4.22	3.49	3.80	3.51	3.56	3.82	3.75	3.66	3.71	4.00	3.50	3.58	4.00	3.63	3.60
1981	41	21	4.5900	4.31	3.52	3.85	3.54	3.61	3.85	3.80	3.70	3.77	4.04	3.55	3.62	4.05	3.66	3.60
1981	42	19	4.5375	4.25	3.51	3.82	3.51	3.57	2.84	3.77	3.71	3.76	4.01	3.52	3.58	4.02	3.63	3.58
1981	43	34	4.7300	4.34	3.55	3.86	3.67	3.73	3.91	3.82	3.83	3.90	4.09	3.72	3.70	4.07	3.73	3.65
1981	44	36	4.7800	4.41	3.58	3.91	3.69	3.73	3.96	3.87	3.85	3.95	4.12	3.71	3.77	4.07	3.77	3.68
1981	45	36	4.7600	4.38	3.58	3.94	3.69	3.74	3.98	5.93	3.35	3.95	4.18	3.70	3.75	4.13	3.81	3.73
1981	46	47	4.8900	4.47	3.73	4.02	3.79	3.85	4.03	4.01	3.94	4.04	4.25	3.80	3.85	4.21	3.91	3.81
1981	47	35	4.8600	4.45	3.71	4.00	3.77	3.84	4.02	3.99	3.93	4.02	4.23	3.78	3.83	4.20	3.89	3.79
1981	48	35	4.9175	4.54	3.78	4.07	3.83	3.91	4.09	4.05	4.00	4.08	4.30	3.84	3.90	4.27	3.95	3.85
1981	49	41	4.7950	4.40	3.64	3.94	3.70	3.77	3.96	3.90	3.82	3.88	4.08	3.71	3.77	4.18	3.73	3.68
1981	50	41	4.6425	4.09	3.49	3.80	3.52	3.60	3.82	3.75	3.70	3.74	3.92	3.55	3.59	4.04	3.59	3.55
1981	51	38	4.4300	4.10	3.27	3.59	3.31	3.40	3.60	3.54	3.48	3.54	3.74	3.34	3.39	3.83	3.40	3.33
1981	52	43	4.5850	4.20	3.41	3.75	3.47	3.56	3.75	3.70	3.63	3.70	3.93	3.49	3.55	3.99	3.57	3.48
1982	1	48	4.7400	4.35	3.64	3.91	3.61	3.72	3.96	3.86	3.80	3.86	4.11	3.66	3.71	4.18	3.76	3.65
1982	2	56	4.7375	4.36	3.66	3.90	3.55	3.65	3.88	3.87	3.74	3.86	4.07	3.60	3.68	4.13	3.71	3.62
1982	3	54	4.6750	4.24	3.55	3.80	3.48	3.58	3.81	3.80	3.68	3.79	3.99	3.53	3.62	4.10	3.63	3.53
1982	4	54	4.6625	4.23	3.52	3.81	3.52	3.61	3.81	3.80	3.71	3.80	4.02	3.54	3.64	4.04	3.63	3.56
1982	5	57	4.7375	4.31	3.60	3.85	3.57	3.68	3.86	3.83	3.81	3.85	4.05	3.62	3.70	4.08	3.67	3.59
1982	6	52	4.6750	4.28	3.55	3.83	3.54	3.65	3.84	3.79	3.76	3.80	4.03	3.59	3.65	4.07	3.66	3.58
1982	7	56	4.6775	4.26	3.52	3.89	3.65	3.73	3.84	3.84	3.82	3.82	4.00	3.67	3.70	4.05	3.63	3.54
1982	8	58	4.5875	4.17	3.55	3.78	3.52	3.60	3.74	3.74	3.76	3.76	3.89	3.54	3.60	3.95	3.54	3.44
1982	9	62	4.5850	4.23	3.56	3.82	3.57	3.65	3.76	3.79	3.77	3.76	3.98	3.57	3.64	3.99	3.60	3.50
1982	10	64	4.5950	4.27	3.60	3.84	3.60	3.69	3.80	3.81	3.79	3.79	4.00	3.63	3.68	4.03	3.61	3.57
1982	11	62	4.5475	4.23	3.51	3.79	3.52	3.61	3.75	3.76	3.71	3.74	3.93	3.55	3.62	3.98	3.55	3.47
1982	12	63	4.5900	4.26	3.57	3.85	3.58	3.65	3.83	3.81	3.76	3.80	3.97	3.59	3.67	4.01	3.70	3.61
1982	13	67	4.6425	4.24	3.57	3.85	3.59	3.67	3.81	3.82	3.79	3.82	3.96	3.61	3.69	4.00	3.70	3.63
1982	14	65	4.6500	4.28	3.61	3.87	3.62	3.70	3.82	3.84	3.84	3.85	4.00	3.64	3.72	4.02	3.73	3.65
1982	15	58	4.6075	4.29	3.60	3.85	3.57	3.65	3.80	3.80	3.83	3.81	3.95	3.59	3.68	4.00	3.67	3.60
1982	16	53	4.5900	4.28	3.56	3.85	3.57	3.65	3.80	3.79	3.83	3.80	3.96	3.59	3.68	4.00	3.68	3.60
1982	17	57	4.6200	4.28	3.54	3.87	3.59	3.69	2.81	3.82	3.86	3.81	3.97	3.62	3.70	4.03	3.72	3.62
1982	18	70	4.6000	4.30	3.45	3.85	3.57	3.65	3.79	3.80	3.79	3.79	3.95	3.57	3.65	3.98	3.67	3.60
1982	19	85	4.6150	4.21	3.52	3.88	3.59	3.69	3.82	3.81	3.75	3.81	3.98	3.61	3.73	4.00	3.71	3.62
1982	20	85	4.6425	4.32	3.57	3.88	3.59	3.70	3.84	3.81	3.74	3.82	3.97	3.62	3.71	4.04	3.71	3.63
1982	21	71	4.4250	4.09	3.50	3.68	3.39	3.49	3.62	3.62	3.55	3.62	3.75	3.42	3.53	3.80	3.52	3.42
1982	22	60	4.2275	4.04	3.30	3.48	3.18	3.28	3.51	3.42	3.35	3.47	3.58	3.21	3.30	3.71	3.35	3.19
1982	23	55	4.1825	4.06	3.41	3.57	3.16	3.25	3.64	3.53	3.34	3.54	3.60	3.18	3.26	3.71	3.47	3.35
1982	24	66	4.2900	4.19	3.47	3.63	3.21	3.33	3.71	3.58	3.45	3.57	3.78	3.28	3.36	3.95	3.55	3.46
1982	25	60	4.2600	3.84	3.25	3.53	3.22	3.27	3.49	3.50	3.46	3.55	3.63	3.25	3.32	3.75	5.37	3.32
1982	26	58	4.2000	3.81	3.08	3.37	3.11	3.20	3.30	3.33	3.34	3.35	3.42	3.10	3.25	3.57	3.20	3.13
1982	27	40	3.9500	3.65	3.00	3.16	2.91	3.00	3.15	3.12	3.13	3.13	3.28	2.95	3.35	3.37	3.01	2.92
1982	28	43	4.1100	3.68	3.14	3.30	3.09	3.16	3.34	3.30	3.31	3.27	3.45	3.13	3.19	3.54	3.18	3.10
1982	29	46	4.1875	3.85	3.22	3.27	3.14	3.22	3.35	3.33	3.37	3.33	3.53	3.18	3.26	3.62	3.22	3.18
1982	30	48	4.1225	3.72	3.12	3.30	3.10	3.18	3.26	3.26	3.32	3.27	3.44	3.13	3.23	3.54	3.17	3.08
1982	31	54	4.1450	3.67	3.09	3.25	3.08	3.15	3.28	3.22	3.30	3.24	3.39	3.09	3.16	3.51	3.15	3.06
1982	32	49	4.0225	3.59	2.92	3.11	2.94	2.99	3.17	3.07	3.20	3.09	3.28	2.98	2.95	3.40	3.03	2.98
1982	33	54	4.2200	3.74	3.16	3.35	3.20	3.24	3.37	3.32	3.42	3.35	3.53	3.19	3.25	3.62	3.28	3.13

YEAR	WEEK	GF_BASIS	GULF810	KC_CASH	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1982	34	50	4.2200	3.76	3.19	3.36	3.20	3.24	3.38	3.32	3.42	3.35	3.55	3.20	3.25	3.64	3.29	3.17
1982	35	39	4.2225	3.77	3.15	3.36	3.19	3.23	3.41	3.31	3.41	3.34	3.57	3.19	3.25	3.64	3.28	3.14
1982	36	32	4.1550	3.75	3.16	3.34	3.16	3.20	3.39	3.28	3.39	3.33	3.54	3.15	3.20	3.57	3.24	3.13
1982	37	37	4.1975	3.79	3.14	3.37	3.20	3.23	3.40	3.32	3.41	3.37	3.56	3.18	3.23	3.61	3.27	3.13
1982	38	34	4.1425	3.73	3.17	3.34	3.14	3.19	3.39	3.28	3.37	3.39	3.52	3.13	3.19	3.54	3.23	3.10
1982	39	32	4.0650	3.69	3.13	3.30	3.11	3.16	3.35	3.23	3.35	3.33	3.49	3.09	3.17	3.55	3.22	3.08
1982	40	38	4.0550	3.64	3.08	3.26	3.09	3.14	3.29	3.23	3.33	3.28	3.46	3.08	3.15	3.48	3.15	3.03
1982	41	43	4.0875	3.65	3.10	3.27	3.07	3.14	3.24	3.19	3.31	3.24	3.45	3.06	3.16	3.45	3.15	3.03
1982	42	45	3.9700	3.57	2.96	3.17	2.97	3.04	3.17	3.11	3.20	3.20	3.35	2.98	3.02	3.37	3.09	2.98
1982	43	48	3.9550	3.55	3.00	3.17	3.03	3.06	3.17	3.13	3.22	3.23	3.40	3.01	3.06	3.38	3.07	2.96
1982	44	49	4.0725	3.71	3.09	3.31	3.15	3.18	3.30	3.25	3.34	3.28	3.53	3.15	3.20	3.52	3.20	3.10
1982	45	50	4.1175	3.78	3.16	3.33	3.18	3.22	3.33	3.28	3.37	3.30	3.57	3.18	3.22	3.52	3.24	3.13
1982	46	54	4.1825	3.86	3.24	3.44	3.23	3.29	3.39	3.37	3.44	3.37	3.66	3.25	3.32	3.63	3.31	3.22
1982	47	58	4.4000	4.01	3.39	3.60	3.41	3.47	3.58	3.54	3.62	3.47	3.83	3.43	3.48	3.80	3.49	3.37
1982	48	57	4.3250	3.91	3.30	3.49	3.30	3.35	3.49	3.42	3.51	3.47	3.70	3.30	3.35	3.69	3.40	3.31
1982	49	51	4.2500	3.97	3.31	3.50	3.29	3.33	3.52	3.42	3.49	3.50	3.72	3.28	3.33	3.70	3.38	3.31
1982	50	55	4.3050	3.94	3.30	3.52	3.29	3.35	3.50	3.45	3.53	3.48	3.72	3.30	3.37	3.74	3.38	3.30
1982	51	63	4.4200	3.99	3.38	3.58	3.34	3.46	3.54	3.52	3.60	3.53	3.80	3.41	3.46	3.75	3.47	3.35
1982	52	64	4.4400	4.00	3.42	3.60	3.38	3.47	3.56	3.53	3.64	3.55	3.80	3.41	3.48	3.74	3.51	3.46
1983	1	68	4.4250	3.99	3.37	3.56	3.36	3.42	3.52	3.49	3.61	3.51	3.75	3.36	3.42	3.65	3.47	3.40
1983	2	70	4.4825	3.98	3.36	3.60	3.44	3.54	3.56	3.58	3.62	3.55	3.80	3.46	3.54	3.74	3.55	3.43
1983	3	69	4.4850	3.99	3.40	3.53	3.39	3.41	3.54	3.53	3.58	3.52	3.72	3.38	3.49	3.74	3.52	3.42
1983	4	68	4.4775	3.99	3.42	3.57	3.42	3.46	3.58	3.54	3.58	3.56	3.75	3.40	3.50	3.75	3.53	3.43
1983	5	64	4.4850	4.03	3.44	3.60	3.40	3.48	3.61	3.57	3.56	3.64	3.79	3.42	3.52	3.79	3.53	3.47
1983	6	57	4.4325	4.03	3.39	3.60	3.37	3.45	3.58	3.56	3.52	3.65	3.79	3.39	3.47	3.78	3.55	3.46
1983	7	57	4.4950	4.09	3.44	3.68	3.43	3.51	3.66	3.65	3.59	3.72	3.85	3.45	3.54	3.87	3.61	3.53
1983	8	59	4.4300	4.06	3.43	3.67	3.47	3.49	3.65	3.65	3.60	3.72	3.98	3.44	3.50	3.83	3.58	3.50
1983	9	68	4.5050	4.12	3.43	3.70	3.50	3.53	3.67	3.68	3.62	3.74	3.89	3.45	3.52	3.84	3.60	3.55
1983	10	69	4.5175	4.11	3.55	3.75	3.53	3.57	3.68	3.73	3.69	3.81	3.91	3.53	3.56	3.85	3.63	3.59
1983	11	64	4.5125	4.15	3.53	3.76	3.54	3.56	3.72	3.72	3.66	3.78	3.92	3.53	3.56	3.89	3.63	3.60
1983	12	56	4.5550	4.24	3.61	3.81	3.58	3.64	3.78	3.80	3.71	3.82	4.00	3.59	3.61	3.98	3.68	3.64
1983	13	60	4.5700	4.22	3.61	3.82	3.57	3.65	3.75	3.82	3.72	3.82	4.00	3.59	3.61	3.95	3.69	3.63
1983	14	60	4.5925	4.22	3.66	3.87	3.61	3.70	3.79	3.85	3.76	3.87	4.04	3.64	3.66	3.98	3.73	3.68
1983	15	63	4.6175	4.22	3.70	3.90	3.65	3.74	3.84	3.89	3.80	3.89	4.09	3.66	3.67	4.00	3.76	3.72
1983	16	58	4.4200	4.13	3.45	3.74	3.44	3.54	3.70	3.70	3.60	3.71	3.90	3.44	3.46	3.87	3.57	3.61
1983	17	56	4.4775	4.19	3.65	3.83	3.54	3.64	3.79	3.80	3.72	3.81	4.01	3.55	3.57	3.99	3.68	3.73
1983	18	68	4.3925	4.12	3.53	3.70	3.38	3.52	3.65	3.65	3.58	3.66	3.84	3.45	3.44	3.88	3.53	3.59
1983	19	56	4.2100	3.98	3.34	3.58	3.24	3.36	3.53	3.52	3.44	3.52	3.70	3.31	3.32	3.74	3.41	3.47
1983	20	54	4.2500	4.01	3.38	3.60	3.28	3.37	3.56	3.55	3.48	3.56	3.73	3.33	3.35	3.78	3.46	3.49
1983	21	56	4.2300	4.04	3.42	3.62	3.36	3.45	3.53	3.63	3.49	3.64	3.81	3.42	3.40	3.71	3.49	3.49
1983	22	56	4.1550	4.01	3.36	3.53	3.11	3.20	3.51	3.42	3.36	3.44	3.62	3.18	3.22	3.70	3.41	3.45
1983	23	58	4.1325	3.99	3.36	3.52	3.11	3.17	3.51	3.50	3.32	3.43	3.65	3.15	3.20	3.70	3.43	3.45
1983	24	45	4.0300	3.97	3.37	3.53	3.10	3.16	3.52	3.48	3.31	3.54	3.56	3.13	3.22	3.74	3.43	3.43
1983	25	45	4.0725	3.81	3.23	3.40	3.13	3.16	3.40	3.32	3.29	3.38	3.49	3.27	3.23	3.56	3.32	3.31
1983	26	43	4.0100	3.78	3.20	3.35	3.08	3.14	3.34	3.29	3.33	3.41	3.45	3.17	3.18	3.53	3.23	3.28

APPENDIX G

WEEKLY GULF RAIL RATES

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1977	1	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	2	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	3	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	4	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	5	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	6	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	7	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	8	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	9	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	10	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	11	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	12	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	13	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	14	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	15	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	16	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	17	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	18	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	19	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	20	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	21	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	22	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	23	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	24	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	25	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	26	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	27	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	28	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	29	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	30	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	31	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	32	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	33	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	34	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	35	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	36	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	37	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	38	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	39	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	40	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	41	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	42	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	43	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	44	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	45	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	46	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	47	75.5	57.5	62	59	59	59	57.5	59.5	54.5	63.5	50	54.0	69.5	70
1977	48	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74
1977	49	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74
1977	50	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74
1977	51	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74
1977	52	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74
1978	1	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74
1978	2	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74
1978	3	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74
1978	4	79.5	60.5	65	62	62	62	60.5	62.5	57.5	67.0	52	56.5	73.0	74

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1978	5	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	6	79.5	60.5	65.0	62.0	62.0	62.0	60.9	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	7	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	8	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	9	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	10	79.5	60.5	65.0	62.0	62.0	62.0	60.9	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	11	79.5	60.9	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	12	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	13	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	14	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.9	73.0	74
1978	15	79.5	60.5	65.3	62.0	62.0	62.0	60.5	62.5	97.5	67.0	52.0	56.5	73.0	74
1978	16	79.5	60.9	65.0	62.0	62.0	62.0	60.5	62.9	57.5	67.0	52.0	56.5	73.0	74
1978	17	75.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.9	73.0	74
1978	18	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	19	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	97.5	67.0	52.0	56.5	73.3	74
1978	20	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	21	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	22	79.9	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.5	73.0	74
1978	23	79.5	60.5	65.0	62.0	62.0	62.0	60.5	62.5	57.5	67.0	52.0	56.9	73.0	74
1978	24	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	99.5	69.5	54.5	59.0	76.0	77
1978	25	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	55.5	69.5	54.5	59.0	76.0	77
1978	26	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	65.5	54.9	59.0	76.0	77
1978	27	83.0	63.0	67.5	64.0	64.0	64.0	63.0	69.0	59.5	69.5	54.9	59.0	76.0	77
1978	28	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.9	54.5	59.0	76.0	77
1978	29	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	99.5	69.5	54.5	55.0	76.0	77
1978	30	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.9	55.0	76.0	77
1978	31	83.0	63.0	67.9	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.5	59.0	76.0	77
1978	32	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.5	59.0	76.0	77
1978	33	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.5	59.0	76.0	77
1978	34	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.5	55.0	76.0	77
1978	35	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.9	55.0	76.0	77
1978	36	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	65.5	54.5	59.0	76.0	77
1978	37	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	65.5	54.5	59.0	76.0	77
1978	38	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.5	59.0	76.0	77
1978	39	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	55.5	69.5	54.5	59.0	76.0	77
1978	40	83.0	63.0	67.5	64.0	64.0	54.0	63.0	65.0	59.5	69.5	54.5	59.0	76.0	77
1978	41	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.5	59.0	76.0	77
1978	42	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.5	59.0	76.0	77
1978	43	83.0	63.0	67.5	64.0	64.0	64.0	63.0	69.0	59.5	69.5	54.5	59.0	76.0	77
1978	44	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	55.5	69.5	54.5	59.0	76.0	77
1978	45	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	99.5	69.5	54.5	59.0	76.0	77
1978	46	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	65.5	54.5	59.0	76.0	77
1978	47	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	95.5	69.5	54.5	59.0	76.0	77
1978	48	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	55.5	65.5	54.5	99.0	76.0	77
1978	49	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	59.5	69.5	54.9	59.0	76.0	77
1978	50	83.0	63.0	67.5	64.0	64.0	64.0	63.0	65.0	99.5	69.5	54.5	59.0	76.0	77
1978	51	55.5	67.5	72.5	68.5	68.5	68.5	67.5	65.5	64.0	74.5	58.3	63.5	81.9	82
1978	52	88.5	67.5	72.5	68.5	68.9	68.5	67.5	69.5	64.0	74.5	58.3	63.9	81.5	82
1979	1	85.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	55.0	63.9	81.5	82
1979	2	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82
1979	3	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82
1979	4	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.9	98.0	63.5	81.5	82
1979	5	88.5	67.5	72.5	68.5	68.5	68.9	67.5	69.9	64.0	74.5	58.0	63.5	81.5	82
1979	6	88.9	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82
1979	7	88.5	67.5	72.5	68.5	68.5	68.5	67.5	65.5	64.0	74.5	58.0	63.5	81.5	82
1979	8	58.9	67.9	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1979	9	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	10	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	11	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	12	98.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	13	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	14	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	15	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	16	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	92.0
1979	17	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	18	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	19	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	20	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	21	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	22	88.5	67.5	72.5	68.5	68.5	68.5	67.5	69.5	64.0	74.5	58.0	63.5	81.5	82.0
1979	23	89.5	68.5	73.0	69.5	69.5	69.5	68.5	70.0	65.0	75.5	59.0	64.0	82.5	83.0
1979	24	89.5	68.5	73.0	69.5	69.5	69.5	68.5	70.0	65.0	75.5	59.0	64.0	82.5	83.0
1979	25	89.5	68.5	73.0	69.5	69.5	69.5	68.5	70.0	65.0	75.5	59.0	64.0	82.5	83.0
1979	26	89.5	68.5	73.0	69.5	69.5	69.5	68.5	70.0	65.0	75.5	59.0	64.0	82.5	83.0
1979	27	89.5	68.5	73.0	69.5	69.5	69.5	68.5	70.0	65.0	75.5	59.0	64.0	82.5	83.0
1979	28	91.0	69.5	74.0	70.5	70.5	70.5	69.5	71.0	65.5	76.5	59.5	65.0	83.5	84.0
1979	29	91.0	69.5	74.0	70.5	70.5	70.5	69.5	71.0	65.5	76.5	59.5	65.0	83.5	84.0
1979	30	91.0	69.5	74.0	70.5	70.5	70.5	69.5	71.0	65.5	76.5	59.5	65.0	83.5	84.0
1979	31	92.0	70.0	75.0	71.5	71.5	71.5	70.0	72.0	66.5	77.0	60.0	66.0	84.5	85.0
1979	32	92.0	70.0	75.0	71.5	71.5	71.5	70.0	72.0	66.5	77.0	60.0	66.0	84.5	85.0
1979	33	52.0	70.0	75.0	71.5	71.5	71.5	70.0	72.0	66.5	77.0	60.0	66.0	84.5	85.0
1979	34	92.0	70.0	75.0	71.5	71.5	71.5	70.0	72.0	66.5	77.0	60.0	66.0	84.5	85.0
1979	35	92.0	70.0	75.0	71.5	71.5	71.5	70.0	72.0	66.5	77.0	60.0	66.0	84.5	85.0
1979	36	92.0	70.0	75.0	71.5	71.5	71.5	70.0	72.0	66.5	77.0	60.0	66.0	84.5	85.0
1979	37	92.0	70.0	75.0	71.5	71.5	71.5	70.0	72.0	66.5	77.0	60.0	66.0	84.5	85.0
1979	38	93.0	71.0	76.0	72.0	72.0	72.0	71.0	72.5	67.0	78.0	61.0	66.5	85.5	86.0
1979	39	93.0	71.0	76.0	72.0	72.0	72.0	71.0	72.5	67.0	78.0	61.0	66.5	85.5	86.0
1979	40	93.0	71.0	76.0	72.0	72.0	72.0	71.0	72.5	67.0	78.0	61.0	66.5	85.5	86.0
1979	41	93.0	71.0	76.0	72.0	72.0	72.0	71.0	72.5	67.0	78.0	61.0	66.5	85.5	86.0
1979	42	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	43	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	44	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	45	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	46	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	47	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	48	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	49	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	50	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	51	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1979	52	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1980	1	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1980	2	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1980	3	103.0	78.5	84.5	80.0	80.0	80.0	78.5	80.5	74.5	86.5	68.0	74.0	95.0	95.5
1980	4	104.0	79.5	85.0	81.0	81.0	81.0	79.5	81.5	75.0	87.5	68.5	74.5	96.0	97.0
1980	5	104.0	79.5	85.0	81.0	81.0	81.0	79.5	81.5	75.0	87.5	68.5	74.5	96.0	97.0
1980	6	104.0	79.5	85.0	81.0	81.0	81.0	79.5	81.5	75.0	87.5	68.5	74.5	96.0	97.0
1980	7	104.0	79.5	85.0	81.0	81.0	81.0	79.5	81.5	75.0	87.5	68.5	74.5	96.0	97.0
1980	8	104.0	79.5	85.0	81.0	81.0	81.0	79.5	81.5	75.0	87.5	68.5	74.5	96.0	97.0
1980	9	106.5	81.0	97.0	82.5	82.5	82.5	81.0	83.0	76.5	89.5	70.0	76.0	98.0	98.5
1980	10	106.5	81.0	87.0	82.5	82.5	82.5	81.0	83.0	76.5	89.5	70.0	76.0	98.0	98.5
1980	11	106.5	81.0	87.0	82.5	82.5	82.5	81.0	83.0	76.5	89.5	70.0	76.0	98.0	98.5
1980	12	106.5	81.0	87.0	82.5	82.5	82.5	81.0	83.0	76.5	89.5	70.0	76.0	98.0	98.5

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1980	13	106.5	81.0	87.0	82.5	82.5	82.5	81.0	83.0	76.5	69.5	70.0	76.0	98.0	98.5
1980	14	108.5	82.5	88.5	84.5	84.5	84.5	82.5	85.0	78.5	91.0	71.5	77.5	100.0	100.5
1980	15	108.5	82.5	88.5	84.5	84.5	84.5	82.5	85.0	78.5	51.0	71.5	77.5	100.0	100.5
1980	16	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	17	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	18	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	52.5	72.0	78.5	101.0	101.5
1980	19	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	20	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	21	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	22	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	23	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	52.5	72.0	78.5	101.0	101.5
1980	24	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	25	110.0	83.5	89.5	85.5	85.5	55.5	83.5	86.0	75.0	92.5	72.0	78.5	101.0	101.5
1980	26	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	27	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	28	110.0	83.5	89.5	85.5	85.5	85.5	83.5	86.0	79.0	92.5	72.0	78.5	101.0	101.5
1980	29	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	30	117.5	89.5	96.0	91.0	51.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	31	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	32	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	33	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	34	117.5	89.5	96.0	91.0	51.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	35	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	36	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	37	117.5	89.5	96.0	91.0	51.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	38	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	39	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	40	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	41	117.5	89.5	96.0	91.0	51.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	42	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	43	117.5	59.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	44	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	45	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	46	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	47	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	48	117.5	59.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	49	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	50	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	58.5	77.0	84.0	108.0	107.5
1980	51	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	52	117.5	89.5	96.0	91.0	91.0	91.0	89.5	91.5	84.5	98.5	77.0	84.0	108.0	107.5
1980	53	123.0	93.5	101.0	96.0	96.0	96.0	93.5	96.5	88.5	104.0	81.0	88.0	113.5	114.0
1981	1	123.0	93.5	101.0	96.0	96.0	96.0	93.5	96.5	88.5	104.0	81.0	88.0	113.5	114.0
1981	2	123.0	93.5	101.0	96.0	96.0	96.0	93.5	96.5	88.5	104.0	81.0	88.0	113.5	114.0
1981	3	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	4	124.5	94.5	102.0	97.0	57.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	5	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	6	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	7	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	8	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	9	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	10	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	11	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	12	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	13	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	14	124.5	94.5	102.0	97.0	97.0	97.0	94.5	97.5	89.5	105.0	81.5	89.0	115.0	115.5
1981	15	123.0	93.5	100.5	96.0	56.0	96.0	93.5	96.5	88.5	103.5	80.5	88.0	113.5	114.0

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1981	16	123.0	93.5	86.0	80.5	56	96.0	93.5	96.5	88.5	86.0	80.5	61.0	113.5	114.0
1981	17	123.0	93.5	86.0	80.5	96	96.0	93.5	96.5	88.5	86.0	80.5	61.0	113.5	114.0
1981	18	98.0	66.5	86.0	80.5	74	66.5	93.5	69.0	54.0	86.0	80.5	61.0	81.5	86.5
1981	19	98.0	66.5	86.0	80.5	74	66.5	93.5	69.0	54.0	86.0	80.5	61.0	81.5	86.5
1981	20	98.0	66.5	86.0	80.5	74	66.5	93.5	69.0	54.0	86.0	80.5	61.0	81.5	86.5
1981	21	98.0	66.5	86.0	80.5	74	66.5	76.0	69.0	54.0	86.0	76.0	61.0	81.5	86.5
1981	22	98.0	66.5	86.0	80.5	74	66.5	76.0	69.0	54.0	86.0	76.0	61.0	81.5	86.5
1981	23	98.0	66.5	86.0	80.5	74	66.5	76.0	69.0	54.0	86.0	76.0	61.0	81.5	86.5
1981	24	98.0	66.5	86.0	80.5	74	66.5	76.0	69.0	54.0	86.0	76.0	61.0	81.5	86.5
1981	25	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	26	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	27	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	28	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	29	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	30	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	31	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	32	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	33	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	34	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	35	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	36	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	37	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	38	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	39	104.0	69.0	86.0	80.5	77	69.0	76.0	71.0	54.0	86.0	76.0	61.0	86.0	91.0
1981	40	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	41	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	42	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	43	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	44	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	45	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	46	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	47	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	48	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	49	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	50	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	51	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1981	52	104.0	69.0	92.5	86.5	77	69.0	81.5	71.0	54.0	92.5	86.5	65.5	86.0	91.0
1982	1	104.0	69.0	96.5	90.5	77	69.0	85.5	71.0	54.0	96.5	90.5	68.5	86.0	91.0
1982	2	104.0	69.0	96.5	90.5	77	69.0	85.5	71.0	54.0	96.5	90.5	68.5	86.0	91.0
1982	3	104.0	69.0	96.5	90.5	77	69.0	85.5	71.0	54.0	96.5	90.5	68.5	86.0	91.0
1982	4	104.0	69.0	96.5	90.5	77	69.0	85.5	71.0	54.0	96.5	90.5	68.5	86.0	91.0
1982	5	104.0	69.0	96.5	90.5	77	69.0	85.5	71.0	54.0	96.5	90.5	68.5	86.0	91.0
1982	6	104.0	69.0	96.5	90.5	77	69.0	85.5	71.0	54.0	96.5	90.5	68.5	86.0	91.0
1982	7	104.0	69.0	80.5	74.0	77	69.0	60.5	71.0	54.0	81.0	90.5	68.5	86.0	91.0
1982	8	83.5	69.0	80.5	74.0	77	69.0	60.5	71.0	54.0	81.0	90.5	52.5	86.0	91.0
1982	9	83.5	61.0	80.5	74.0	73	63.0	60.5	71.0	54.0	81.0	90.5	52.5	86.0	91.0
1982	10	83.5	61.0	80.5	74.0	73	63.0	60.5	71.0	54.0	81.0	70.5	52.5	86.0	91.0
1982	11	83.5	61.0	80.5	74.0	73	63.0	60.5	71.0	54.0	81.0	70.5	52.5	86.0	91.0
1982	12	83.5	61.0	80.5	74.0	73	63.0	60.5	71.0	54.0	81.0	70.5	52.5	86.0	91.0
1982	13	83.5	61.0	80.5	74.0	73	63.0	60.5	71.0	54.0	81.0	70.5	52.5	86.0	91.0
1982	14	83.5	61.0	80.5	74.5	61	63.0	60.5	67.0	54.0	81.0	70.5	53.0	78.0	79.0
1982	15	83.5	61.0	80.5	74.5	61	63.0	60.5	67.0	54.0	81.0	70.5	53.0	78.0	79.0
1982	16	83.5	61.0	80.5	74.5	61	63.0	60.5	67.0	54.0	81.0	70.5	53.0	78.0	79.0
1982	17	83.5	61.0	80.5	74.5	61	63.0	60.5	67.0	54.0	81.0	70.5	53.0	78.0	79.0
1982	18	83.5	61.0	80.5	74.5	61	63.0	60.5	67.0	54.0	81.0	70.5	53.0	78.0	79.0
1982	19	83.5	61.0	80.5	74.5	61	63.0	60.5	67.0	54.0	81.0	70.5	53.0	78.0	79.0

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1982	20	83.5	61.0	80.5	74.5	61.0	63.0	60.5	67.0	54	81.0	70.5	53.0	78.0	79.0
1982	21	83.5	61.0	80.5	74.5	61.0	63.0	60.5	67.0	54	81.0	70.5	53.0	78.0	79.0
1982	22	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	70.5	52.5	78.0	83.0
1982	23	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	70.5	52.5	78.0	83.0
1982	24	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	25	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	26	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	27	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	28	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	29	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	30	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	31	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	32	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	33	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	34	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	35	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	36	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	37	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	38	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	39	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	40	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	41	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	42	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	43	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	44	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	45	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	46	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.5	54	84.0	73.5	52.5	78.0	83.0
1982	47	83.5	64.0	83.5	77.5	64.0	66.0	63.5	70.0	54	84.0	73.0	53.0	78.0	83.0
1982	48	83.5	66.0	85.0	79.0	66.0	66.0	65.5	72.0	54	86.0	75.5	53.0	80.0	84.5
1982	49	83.5	66.0	85.0	79.0	66.0	66.0	65.5	72.0	54	86.0	75.5	53.0	80.0	84.5
1982	50	83.5	66.0	85.0	79.0	66.0	66.0	65.5	72.0	54	86.0	75.5	53.0	80.0	84.5
1982	51	83.5	66.0	85.0	79.0	66.0	66.0	65.5	72.0	54	86.0	75.5	53.0	80.0	84.5
1982	52	83.5	66.0	85.0	79.0	66.0	66.0	65.5	72.0	54	86.0	75.5	53.0	80.0	84.5
1983	1	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	2	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	3	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	4	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	5	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	6	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	7	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	8	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	9	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	10	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	11	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	12	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	13	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	14	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	15	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	16	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	17	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	18	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	19	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	20	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	21	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	22	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8
1983	23	84.0	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65.0	49.5	71.6	75.8

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1983	24	84	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65	49.5	71.6	75.8
1983	25	84	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65	49.5	71.6	75.8
1983	26	84	59.5	77.5	67.8	59.5	59.5	56.5	64.5	48	69.5	65	49.5	71.6	75.8

APPENDIX H

WEEKLY KANSAS CITY RAIL RATES

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1977	1	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	2	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	3	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	4	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	5	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	6	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	7	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	8	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	9	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	10	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	11	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	12	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	13	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	14	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	15	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	16	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	17	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	18	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	19	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	20	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	21	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	22	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	23	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	24	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	25	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	26	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	27	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	28	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	29	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	30	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	31	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	32	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	33	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	34	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	35	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	36	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	37	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	38	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	39	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	40	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	41	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	42	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	43	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	44	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	45	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	46	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	47	45.0	28.5	44	36.5	22.0	30.5	34.5	34.5	30.5	42.5	48.5	19	37.5	42.5
1977	48	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5
1977	49	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5
1977	50	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5
1977	51	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5
1977	52	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5
1978	1	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5
1978	2	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5
1978	3	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5
1978	4	47.5	30.0	46	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20	39.5	44.5

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1978	5	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	6	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	7	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	8	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	9	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	10	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	11	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	12	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	13	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	14	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	15	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	16	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	17	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	18	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	19	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	20	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	21	47.5	30.0	46.0	38.0	23.5	22.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	22	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	23	47.5	30.0	46.0	38.0	23.5	32.0	36.5	36.5	32.0	44.5	50.5	20.0	39.5	44.5
1978	24	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	25	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	26	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	27	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	28	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	29	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	30	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	31	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	32	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	33	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	34	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	35	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	36	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	37	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	38	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	39	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	40	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	41	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	42	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	43	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	44	49.0	31.0	47.5	39.5	24.5	33.0	35.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	45	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	46	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	47	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	48	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	49	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	50	49.0	31.0	47.5	39.5	24.5	33.0	38.0	38.0	33.0	46.5	53.0	20.5	41.0	46.5
1978	51	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1978	52	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	1	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	2	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	3	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	4	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	5	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	6	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	7	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	8	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1979	9	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	10	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	11	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	12	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	13	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	14	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	15	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	16	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	17	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	18	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	19	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	20	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	21	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	22	52.5	33.5	51.0	42.5	26.0	35.5	40.5	40.5	35.5	50.0	56.5	22.0	44.0	50.0
1979	23	53.0	33.5	51.5	43.0	26.5	35.5	41.0	41.0	35.5	50.5	57.0	22.5	44.5	50.5
1979	24	53.0	33.5	51.5	43.0	26.5	35.5	41.0	41.0	35.5	50.5	57.0	22.5	44.5	50.5
1979	25	53.0	33.5	51.5	43.0	26.5	35.5	41.0	41.0	35.5	50.5	57.0	22.5	44.5	50.5
1979	26	53.0	33.5	51.5	43.0	26.5	35.5	41.0	41.0	35.5	50.5	57.0	22.5	44.5	50.5
1979	27	53.0	33.5	51.5	43.0	26.5	35.5	41.0	41.0	35.5	50.5	57.0	22.5	44.5	50.5
1979	28	54.0	34.0	52.5	43.5	27.0	36.0	41.5	41.5	36.0	51.0	58.0	23.0	45.0	51.0
1979	29	54.0	34.0	52.5	43.5	27.0	36.0	41.5	41.5	36.0	51.0	58.0	23.0	45.0	51.0
1979	30	54.0	34.0	52.5	43.5	27.0	36.0	41.5	41.5	36.0	51.0	58.0	23.0	45.0	51.0
1979	31	54.5	34.5	53.0	44.0	27.0	36.5	42.0	42.0	36.5	51.5	58.5	23.0	45.5	51.5
1979	32	54.5	34.5	53.0	44.0	27.0	36.5	42.0	42.0	36.5	51.5	58.5	23.0	45.5	51.5
1979	33	54.5	34.5	53.0	44.0	27.0	36.5	42.0	42.0	36.5	51.5	58.5	23.0	45.5	51.5
1979	34	54.5	34.5	53.0	44.0	27.0	36.5	42.0	42.0	36.5	51.5	58.5	23.0	45.5	51.5
1979	35	54.5	34.5	53.0	44.0	27.0	36.5	42.0	42.0	36.5	51.5	58.5	23.0	45.5	51.5
1979	36	54.5	34.5	53.0	44.0	27.0	36.5	42.0	42.0	36.5	51.5	58.5	23.0	45.5	51.5
1979	37	54.5	34.5	53.0	44.0	27.0	36.5	42.0	42.0	36.5	51.5	58.5	23.0	45.5	51.5
1979	38	55.0	35.0	53.5	44.5	27.5	37.0	42.5	42.5	37.0	52.0	59.0	23.5	46.0	52.0
1979	39	55.0	35.0	53.5	44.5	27.5	37.0	42.5	42.5	37.0	52.0	59.0	23.5	46.0	52.0
1979	40	55.0	35.0	53.5	44.5	27.5	37.0	42.5	42.5	37.0	52.0	59.0	23.5	46.0	52.0
1979	41	55.0	35.0	53.5	44.5	27.5	37.0	42.5	42.5	37.0	52.0	59.0	23.5	46.0	52.0
1979	42	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	43	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	44	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	45	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	46	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	47	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	48	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	49	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	50	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	51	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1979	52	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1980	1	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1980	2	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1980	3	59.5	38.0	58.0	48.0	29.5	40.0	46.0	46.0	40.0	56.5	64.0	25.0	50.0	56.5
1980	4	60.5	38.0	58.5	48.5	30.0	40.5	46.5	46.5	40.5	57.0	64.5	25.5	50.5	57.0
1980	5	60.5	38.0	58.5	48.5	30.0	40.5	46.5	46.5	40.5	57.0	64.5	25.5	50.5	57.0
1980	6	60.5	38.0	58.5	48.5	30.0	40.5	46.5	46.5	40.5	57.0	64.5	25.5	50.5	57.0
1980	7	60.5	38.0	58.5	48.5	30.0	40.5	46.5	46.5	40.5	57.0	64.5	25.5	50.5	57.0
1980	8	60.5	38.0	58.5	48.5	30.0	40.5	46.5	46.5	40.5	57.0	64.5	25.5	50.5	57.0
1980	9	61.5	39.0	60.0	49.5	30.5	41.5	47.5	47.5	41.5	58.5	66.0	26.0	51.0	58.5
1980	10	61.5	39.0	60.0	49.5	30.5	41.5	47.5	47.5	41.5	58.5	66.0	26.0	51.0	58.5
1980	11	61.5	39.0	60.0	49.5	30.5	41.5	47.5	47.5	41.5	58.5	66.0	26.0	51.0	58.5
1980	12	61.5	39.0	60.0	49.5	30.5	41.5	47.5	47.5	41.5	58.5	66.0	26.0	51.0	58.5

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1980	13	61.5	39.0	60.0	49.5	30.5	41.5	47.5	47.5	41.5	58.5	66.0	26.0	51.0	58.5
1980	14	62.5	39.5	61.0	50.5	31.0	42.5	48.5	48.5	42.5	59.5	67.0	26.5	52.0	59.5
1980	15	62.5	39.5	61.0	50.5	31.0	42.5	48.5	48.5	42.5	59.5	67.0	26.5	52.0	59.5
1980	16	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	17	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	18	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	19	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	20	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	21	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	22	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	23	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	24	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	25	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	26	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	27	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	28	63.5	40.0	61.5	51.0	31.5	43.0	49.0	49.0	43.0	60.0	68.0	26.5	53.0	60.0
1980	29	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	30	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	31	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	32	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	33	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	34	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	35	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	36	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	37	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	38	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	39	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	40	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	41	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	42	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	43	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	44	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	45	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	46	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	47	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	48	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	49	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	50	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	51	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	52	68.0	43.0	66.0	54.5	33.5	46.0	52.0	52.0	46.0	64.0	72.5	28.5	57.0	63.5
1980	53	71.5	45.5	69.0	57.5	35.0	48.0	54.5	54.5	48.0	67.5	76.0	28.5	59.5	67.5
1981	1	71.5	45.5	69.0	57.5	35.0	48.0	54.5	54.5	48.0	67.5	76.0	28.5	59.5	67.5
1981	2	71.5	45.5	69.0	57.5	35.0	48.0	54.5	54.5	48.0	67.5	76.0	28.5	59.5	67.5
1981	3	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	4	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	5	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	6	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	7	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	8	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	9	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	10	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	11	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	12	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	13	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	14	72.5	46.0	70.0	58.5	35.5	48.5	55.5	55.5	48.5	68.0	76.5	30.0	60.0	68.0
1981	15	71.5	45.5	69.0	57.5	35.0	48.0	54.5	54.5	48.0	67.5	76.0	29.5	60.0	67.5

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1901	16	71.5	45.5	63.0	52.0	35	48.0	50.5	54.5	40.0	63.0	76.0	27.5	60.0	67.5
1981	17	71.5	45.5	63.0	52.0	21	40.0	50.5	35.0	48.0	63.0	76.0	27.5	46.5	50.5
1981	18	71.5	45.5	63.0	52.0	21	31.0	50.5	35.0	48.0	63.0	76.0	27.5	46.5	50.5
1901	19	71.5	43.5	63.0	52.0	21	31.0	50.5	35.0	31.5	53.5	76.0	27.5	46.5	50.5
1901	20	71.5	43.5	63.0	52.0	21	31.0	50.5	35.0	31.5	53.5	76.0	27.5	46.5	50.5
1981	21	50.5	43.5	63.0	52.0	21	31.0	50.5	35.0	31.5	53.5	76.0	27.5	46.5	50.5
1981	22	58.5	43.5	63.0	52.0	21	31.0	50.5	35.0	31.5	53.5	76.0	27.5	46.5	50.5
1981	23	58.5	43.5	63.0	52.0	21	31.0	35.0	35.0	31.5	53.5	52.0	27.5	46.5	50.5
1981	24	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	25.5	46.5	50.5
1981	25	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	25.5	46.5	50.5
1981	26	58.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1981	27	58.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1981	28	58.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1981	29	58.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1981	30	58.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1981	31	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1981	32	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1901	33	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1981	34	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	20.0	46.5	50.5
1901	35	58.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	25.5	46.5	50.5
1901	36	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	25.5	46.5	50.5
1981	37	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	25.5	46.5	50.5
1981	38	58.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	25.5	46.5	50.5
1981	39	50.5	43.5	59.5	45.0	21	31.0	35.0	35.0	31.5	53.5	52.0	25.5	46.5	50.5
1981	40	62.5	31.0	57.0	48.0	23	33.5	30.0	38.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	41	62.5	31.0	53.0	44.5	23	33.5	35.0	38.0	33.5	57.0	56.0	21.5	50.0	54.0
1901	42	62.5	31.0	53.0	44.5	23	33.5	35.0	38.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	43	62.5	31.0	53.0	44.5	23	33.5	35.0	38.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	44	62.5	31.0	53.0	44.5	23	33.5	35.0	38.0	33.5	57.0	56.0	21.5	50.0	54.0
1901	45	62.5	31.0	53.0	44.5	23	33.5	25.0	30.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	46	62.5	31.0	53.0	44.5	23	33.5	35.0	30.0	33.5	57.0	56.0	21.5	50.0	54.0
1901	47	62.5	31.0	53.0	44.5	23	33.5	35.0	38.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	48	62.5	31.0	53.0	44.5	23	33.5	35.0	30.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	49	62.5	31.0	53.0	44.5	23	33.5	35.0	38.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	50	62.5	31.0	53.0	44.5	23	33.5	35.0	38.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	51	62.5	31.0	53.0	44.5	23	33.5	35.0	30.0	33.5	57.0	56.0	21.5	50.0	54.0
1981	52	62.5	31.0	53.0	44.5	23	33.5	35.0	30.0	33.5	57.0	56.0	21.5	50.0	54.0
1982	1	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	58.5	22.5	52.0	56.5
1902	2	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	50.5	22.5	52.0	56.5
1982	3	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	50.5	22.5	52.0	56.5
1982	4	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	58.5	22.5	52.0	56.5
1982	5	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	58.5	22.5	52.0	56.5
1982	6	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	58.5	22.5	52.0	56.5
1982	7	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	50.5	22.5	52.0	56.5
1982	0	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	58.5	22.5	52.0	56.5
1982	9	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	50.5	22.5	52.0	56.5
1982	10	65.5	32.5	55.0	50.5	24	35.0	39.5	39.5	34.0	59.5	50.5	22.5	52.0	56.5
1982	11	65.5	32.5	55.0	50.5	31	35.0	39.5	39.5	34.0	59.5	58.5	22.5	52.0	56.5
1982	12	65.5	32.5	55.0	50.5	25	35.0	39.5	30.5	34.0	59.5	58.5	22.5	46.5	56.5
1982	13	65.5	32.5	55.0	50.5	25	35.0	39.5	30.5	34.0	55.5	55.5	22.5	46.5	56.5
1982	14	65.5	32.5	55.0	50.5	25	35.0	39.5	38.5	34.0	59.5	58.5	22.5	46.5	56.5
1982	15	65.5	32.5	55.0	50.5	25	35.0	39.5	30.5	34.0	59.5	58.5	22.5	46.5	56.5
1982	16	65.5	32.5	55.0	50.5	25	35.0	39.5	30.5	34.0	59.5	50.5	22.5	46.5	56.5
1982	17	65.5	32.5	55.0	50.5	25	35.0	39.5	38.5	34.0	59.5	58.5	22.5	46.5	56.5
1982	18	65.5	32.5	55.0	50.5	25	35.0	39.5	30.5	34.0	59.5	50.5	22.5	46.5	56.5
1982	19	65.5	32.5	55.0	50.5	25	35.0	39.5	38.5	34.0	59.5	50.5	22.5	46.5	56.5

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWNEE	SHERIDAN	THOMAS
1982	20	65.5	32.5	55.0	50.5	25.0	35	39.5	38.5	34.0	59.5	58.5	22.5	46.5	56.5
1982	21	65.5	32.5	55.0	50.5	25.0	35	39.5	38.5	34.0	59.5	58.5	22.5	46.5	56.5
1982	22	65.5	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	23	65.5	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	24	65.5	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	25	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	26	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	27	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	28	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	29	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	30	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	31	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	32	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	33	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	34	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	35	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	36	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	37	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	38	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	40.5	56.5
1982	39	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	19.0	46.5	56.5
1982	40	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	41	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	42	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	43	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	44	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	45	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	46	56.0	32.5	71.0	58.5	25.0	35	39.5	38.5	34.0	59.5	58.5	31.0	46.5	56.5
1982	47	57.0	32.5	71.0	50.5	24.5	34	39.5	38.5	35.5	59.5	58.0	18.5	46.0	50.5
1982	48	57.0	32.5	71.0	50.5	24.5	34	39.5	38.5	35.5	59.5	58.0	18.5	46.0	50.5
1982	49	57.0	32.5	71.0	50.5	24.5	34	39.5	38.5	35.5	59.5	58.0	18.5	46.0	50.5
1982	50	57.0	32.5	71.0	50.5	24.5	34	39.5	38.5	35.5	59.5	58.0	18.5	46.0	50.5
1982	51	57.0	32.5	71.0	50.5	24.5	34	39.5	38.5	35.5	59.5	58.0	18.5	46.0	50.5
1982	52	57.0	32.5	71.0	50.5	24.5	34	39.5	38.5	35.5	59.5	58.0	18.5	46.0	50.5
1983	1	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	2	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	3	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	4	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	5	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	6	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	7	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	8	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	9	57.5	33.0	53.5	50.5	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	10	57.5	33.0	53.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	11	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	12	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	13	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	14	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	15	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	16	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	17	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	18	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	19	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	20	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	21	57.5	33.0	51.5	49.0	24.5	35	40.0	39.0	36.0	51.5	59.0	18.5	47.0	51.0
1983	22	57.5	33.0	51.5	51.0	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0
1983	23	57.5	33.0	53.5	51.0	24.5	35	40.0	39.0	36.0	53.5	59.0	18.5	47.0	51.0

YEAR	WEEK	CHEYENNE	CLOUD	FINNEY	FORD	MARSHALL	MITCHELL	PRATT	RUSSELL	SALINE	SCOTT	SEWARD	SHAWHEE	SHERIDAN	THOMAS
1983	24	57.5	33	53.5	51	24.5	35	40	39	36	53.5	59	18.5	47	51
1983	25	57.5	33	53.5	51	24.5	35	40	39	36	53.5	59	18.5	47	51
1983	26	57.5	33	53.5	51	24.5	35	40	39	36	53.5	59	18.5	47	51

ANALYSIS OF INTER-MARKET PRICE SPREADS FOR KANSAS WHEAT: 1977 - 1983

by

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B. S., Kansas State University, 1982

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Agricultural Economics

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1984

This study examines the price spreads between fourteen Kansas elevators, the Kansas City terminal market, and the Gulf of Mexico export market from January 1977 to June 1983. Spatial equilibrium theory states that prices at two spatially separated markets should not differ by more than transfer costs, but may be less than transfer costs. The most significant transfer cost for movement of Kansas wheat to deficit areas is the cost of transportation. Thus, transportation cost influences heavily how inter-market price spreads behave.

Rail is the primary mode for wheat shipments from Kansas elevators. The regulatory environment for railroads changed with the passage of the Staggers Rail Act of 1980. The rate structure present before the regulatory change was based on the transit system with rates set by rate bureaus. The new regulatory environment encouraged a more market-oriented transportation industry. Over the same time period which the new rail transportation regulations took effect, the overall wheat market was such that transportation services were not in high demand. Consequently, railroads introduced new types of rail rates which were lower, but which provided less services to the shipper. These rates included minimum-volume or multi-car rates and mileage-based gathering rates; contract rates also became more prevalent. Export and domestic rail rates for wheat shipment rose steadily through early 1981 and then declined in an irregular pattern over the balance of the study period depending on the specific location.

The price spread between each of the local elevators and both the Gulf market and Kansas City cash market followed the trend of the relevant rail rate for the specific price spread. Analysis of the price spread supports the idea that a local elevator price follows more closely one market′s price as compared to another market's price. There is no evidence to suggest grain merchants have retained transport savings on a statewide basis.

The price spread between the Gulf and Kansas City exhibited two characteristics: 1) it generally does not exceed the average transport cost from Kansas City to the Gulf, and 2) the spread narrows in the fourth quarter of the crop year because of domestic bidding at Kansas City.

The price disadvantage truck grain incurs at Kansas City relative to rail grain declined substantially after the new types of rail rates were instituted. This truck discount also increased throughout the crop year.

Multiple regression is used to explain non-transportation related transfer costs. Wheat protein content and premium, commercial storage utilization, and volume of wheat used are relevant explanatory variables, although the results are inconclusive regarding their effect.

Pricing performance of the Kansas wheat market is examined. Multiple regression of adjusted destination prices on origin prices indicates strong relationships between the two prices; most locations appear to have non-transportation transfer costs that are a function of the wheat price. The differential between origin price and adjusted destination price is not random, but is normally distributed. The conclusion is made that Kansas wheat prices are efficient.

Price spreads among selected markets are examined to determine changes in geographical price relationships. A change in the effective cost of transporting wheat from Kansas origins has changed how prices at some study locations compare to each other. This applies across the state and within regions of the state.

Based on the analysis described above, implications are discussed for wheat producers and grain merchants. Producers should be concerned with the effect on the relative price they receive for their wheat. Grain merchants have experienced a change in their transportation environment and subsequently have had to adjust to a potentially more risky situation.