PROSPECTS FOR CONTRACT RAIL RATES FROM KANSAS COUNTRY ELEVATORS

by

BRIAN J. MAYDEW

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L. O. Gerrson
Major Professor

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I. INTRODUCTION

The production and marketing of grain, particularly wheat, is an important component of the economy of Kansas. The farm value of wheat produced in Kansas in 1979 was over $1.5 billion.[1] Transportation is a vital component of the grain marketing system. The demand for grain at deficit points creates a derived demand for transportation services.

The availability and cost of transportation will, to a large degree, determine the geographic limits of markets accessible to each shipper. Transportation charges are major determinants of price differentials between surplus and deficit areas and even among competing surplus or deficit areas. The locations of storage, processing, and distribution facilities, and ultimately, the patterns of production in and among surplus areas are influenced by availability and cost of transportation.

The high volume and weight of grain in proportion to its value makes transportation a more significant marketing cost factor for grains than for many other commodities. Based on rail rates in effect at the beginning of 1981 (Ex Parte 386), transporting wheat from an average country elevator in Kansas (where it was worth approximately $3.75 per bushel) to a port on the Gulf of Mexico cost over $1.00 per bushel. Farm to elevator handling and movement costs, along with handling costs at elevators, added to rail rates totaled more than 25 percent of the value of wheat at Gulf port elevators. Ocean freight charges add further to the portion of delivered value at final destination which is encompassed in transportation and handling charges.

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[1]Kansas State Board of Agriculture, 63rd Annual Report and Farm Facts, (Topeka: State Printing Office, 1979), p. 134-135.

Grain merchants seek the best net price for grain, i.e., they sell where the market price, less the lowest possible transportation charge, is the highest. The merchants can then offer to buy grain at the net price, less a margin for non-transport marketing services. In this way, transportation charges are incorporated in grain prices. Indeed, they are the primary reason for different wheat prices at different locations. Country elevators base their price on the best net price available at terminals, ports, or mills. Terminal market prices are based on prices at mills or ports. Single-car rail shipments dominate intercity transport of Kansas wheat.

Historically, there has been a stable relationship in transport charges for wheat among origin-destination combinations. This stable relationship has resulted from public regulation of transportation and the responses of transportation firms to regulation. Thus, there has also been a stable relationship among wheat prices at different origins from which shipments go to a common destination. Competitive relationships among shippers and among carriers achieved a stability that may not have been present under unregulated transport conditions. It has been argued that regulation has dampened initiatives in seeking improved transportation alternatives both by carriers and shippers.

The single-car rail method of transporting grain has worked well in the past, but it is in the interest of producers and consumers alike to seek more efficient, less costly wheat transportation. Point-to-point trainload shipments, especially from corn and soybean producing areas, have demonstrated railroad cost economies. Individual contracts between shippers and carriers, only recently permitted, allow the tailoring of services and rates to provide specialized services to shippers and cost savings for carriers.

The "Staggers' Rail Act of 1980" substantially relaxed railroad regulation and provided greater opportunity for rate and service innovations including unit-train rates on wheat shipped from Kansas to export points. Multiple-car rates are basically in two forms. First, they appear as contract rates between individual shippers and carriers. Contract rates usually require a minimum annual volume of grain to be moved by a shipper in trainloads consisting of specified numbers of cars. Second, multiple-car, point-to-point, rates have been instituted as a part of the regular published tariffs of railroads for twenty-five to seventy-five car trains. Both contract rates and unit-train tariffs on wheat have reduced rates from specific origins to specific destinations, hence altering the structure of transport charges from Kansas origins to Gulf ports. While contracts between railroads and shippers involve other issues such as car utilization, service guarantees, switching arrangements, and guaranteed car supply, rate changes have had the principal impact on geographic price patterns for wheat. These changes will affect both the marketing options for grain merchants in the state and their transportation options. This paper is particularly concerned with the options now available to farmers and country elevators.

II. OBJECTIVES

The objectives of this study are:

1) To identify and specify changes in transportation regulations which have provided expanded opportunity for change in transportation charges for grain;
2) To identify the major changes that have occurred in transportation rates for wheat from Kansas origins to various markets since major rail deregulation occurred;
3) To examine the changes in mode of transportation and the savings in transport charges for wheat shipped from Kansas country elevators associated with the changes in transportation rates;
4) To test the hypothesis that wheat price differentials among markets and modes of transportation for Kansas wheat have changed to reflect changes in transport charges; and
5) To identify implications for Kansas grain merchants relative to changes in transport options discovered in objectives 1 through 4.

III. STUDY PROCEDURE

To reach the first objective, it is necessary to examine the history of transportation legislation and how current legislation differs from it. The history of transportation regulation can be found in transportation textbooks, while discussion of current legislation is available in several trade publications.

The sources of information on the changes in transportation rates used in this study were published freight tariffs, summaries of grain tariffs published by the Kansas City Board of Trade, the Contract Advisory Service of the Interstate Commerce Commission, and interviews with trade sources. The modal split for wheat transportation was found in the "Kansas City Grain Market Review."

Historical wheat flows to inland terminals in the state were obtained from a 1977 study by Kansas State University. The savings in transport charges for wheat shipped from Kansas country elevators associated with the current transportation system are based on the least-cost rail route to the Gulf of Mexico. These least cost routes were based on the transportation rates examined earlier and upon railroad mileages from selected origins to Gulf port destinations calculated from the 1980 Railroad Map of Kansas.

To test the hypothesis that price differentials have changed to reflect changes in transportation charges, four sets of prices quoted in the "Grain Market Review" were examined. These prices were used to calculate three price differentials or spreads. The first spread was the spread between the Gulf price and the price of wheat in Kansas City which arrived by rail. The second was the difference between the Gulf price and

the price for wheat delivered to Kansas City by truck. The third was the difference between the price of wheat delivered by rail and that delivered by truck to Kansas City.

The analysis in this study together with conclusions from previous studies will be used to identify the implications for Kansas grain shippers relative to their transportation and market alternatives.

IV. STUDY SETTING

How Transportation Charges Become Embodied in Grain Prices

Transportation charges are inherent in grain prices. Indeed, they are the primary reason for different wheat prices at different locations. Country elevators base their price to farmers on prices available at terminals or mills, less the transportation charge and a margin to cover handling. Inland terminal market prices are based on prices at mills or ports, less transportation and handling. In Kansas wheat markets, transportation charges are the main determinants of price differences, flow patterns, and modes of transportation. The level of the geographic price pattern on a particular day will reflect futures prices. For hard red winter wheat, the relevant price-basing point is the nearby Kansas City futures price. Table 1 shows that the primary reason wheat is worth less in Osborne than in Herington is the higher cost of transportation to Kansas City.

Table 1. Price of #2 HRW Wheat at Selected Points on July 8, 1981

	Kansas City	Herington	Osborne
	----------(dollars per bushel)----------		
Purchase Price	$4.38	$3.86	$3.73
Rail Rate to Kansas City		.24	.36
Gross Margin		.28	.29
		$4.38	$4.38

Transit Rate Structure

The transit rate structure used by railroads in moving wheat is a key element in geographic price relationships, in grain flow patterns, and transport mode selection. The transit system allows wheat to move from intermediate (transit) points at reduced rates if it arrived at those points by rail. Kansas City and other inland terminal cities in Kansas are transit points.

Rail rates from country elevators to transit points appear high relative to trucking costs, but these shipments develop inbound "billing" which can be used to qualify for reduced outbound rates. This system has given railroads an advantage in originating wheat at local points and transporting it through to final destination regardless of intermediate stops.

There are two ways the transit rate structure is applied. The first is the balance of the through rate method. This method is used in transporting wheat through Kansas inland terminals to the Gulf of Mexico. A country-origin shipper has a through rate quoted by the railroads for shipments from the origin to the Gulf. This rate remains the same even if the grain is stopped in transit for processing or storage. The balance of the through rate applying from a transit point to destination is determined by subtracting freight charges to the transit point from the through rate; hence, rates from transit point to destination will vary depending upon the origin specified on original billing. Table 2 compares Osborne and Herington using rail rates in effect on December 31, 1980 (Ex Parte 386).

Table 2. Balance of the Through Rate, Herington and Osborne, Kansas over Kansas City to the Gulf of Mexico, December 31, 1981

	Herington	Osborne
	(cents per bushel)	
Through Rate Origin to Gulf of Mexico	89	97
Flat Rate Origin to Kansas City	48.5	49.7
Balance of Through Rate Kansas City to Gulf of Mexico	40.5	47.3

The proportional rate method is similar to the balance of the through rate but, in the case of Kansas wheat, is applied mainly to wheat moving east from Kansas City. The proportional rate applies on outbound grain from a transit point and is the same regardless of origin of applicable billing. Railroad tariffs indicate whether proportional or balance of the through rates apply on specific movements. The proportional rate is used because it is simpler than the through rate concept. As an example, if grain from both Osborne and Herington was in Kansas City and moving to an eastern destination, the same outbound rate would apply. However, moving on to the Gulf, the grain from Herington would be worth 6.8 cents per bushel more because of the cheaper balance of the through rate. For inland terminal bids to country elevators, the balances are averaged over origins in the state. On December 31, 1980 the average was approximately 47 cents per bushel.[2]

[2]Based on a random sample of export rates of 63 origins out of a population of 323 from the "Grain Rate Book No. 45," Transportation Department, The Board of Trade, Kansas City, Missouri, Inc.

Mode of transportation on inbound movement can be a cause of wheat price differentials at intermediate locations. For example, there is frequently a discount for grain which is trucked to Kansas City relative to that which is transported by rail. The primary reason for the truck discount is the transit arrangement for outbound rail shipments described above. The balance of the through rate on rail grain from Kansas City to the Gulf of Mexico from Osborne, Kansas was 47.3 cents per bushel on December 31, 1980 (Table 3). The flat rate from Kansas City to the Gulf applied to all grain without previous rail movement was 87 cents per bushel. Thus, the previous railroad billing on wheat from Osborne was worth 39.7 cents per bushel (87-47.3) if the billing is to be used for rail shipment of wheat from Kansas City to a Gulf port for export. Because of outbound shipment disadvantage, grain received by truck is priced below grain received by rail. This is referred to as the truck (or billing) discount.

Table 3. Rail and Truck Rates, Herington and Osborne, Kansas over Kansas City to the Gulf of Mexico, December 31, 1981

	Herington		Osborne	
	Rail	Truck	Rail	Truck
	(cents per bushel)			
To Kansas City	48.5	26	49.7	36
Kansas City to Gulf	40.5	87	47.3	87
Total	89.0	113	97.0	123

Because of the practice of discounting trucked wheat, railroads can charge rates higher than truck rates for gathering grain from country points, but can still capture that traffic using lower balance or proportional rates out of the terminals. If all wheat delivered in Kansas City were moving to the Gulf for export, an average balance of the through rate subtracted from the flat rail rate from Kansas City to the Gulf may be expected to equal the truck discount.

In reality it is not this simple, however. The value of billing will depend upon the proportion of grain to be shipped to different destinations. Not all the grain moves to Gulf ports. Some goes to domestic flour mills and to other ports and some is used locally. Another reason for a higher price for wheat which arrives by rail comes when a shipper substitutes a car of grain moving to Kansas City for one which has been sold at another location. The inbound car can move to this new location without ever being unloaded. Grain trucked into Kansas City does not have this alternative.

Ignoring physical differences, if all grain were to be consumed at the terminal, there would be no reason for trucked grain to be discounted. Another factor to be considered is that wheat is only 74 percent flour. If flour from wheat milled in Kansas City is shipped out by rail and the by-products are used locally or shipped out by truck, mills will develop a billing credit. Thus, they can pay more for trucked grain than if the total weight to be shipped out was the same as weight received.

Another alternative for trucked grain at Kansas City and other terminals with water transportation is to move outbound by barge. The barge rate from Kansas City to the Texas Gulf in March 1981 was approximately 42 cents per bushel. This is another factor which serves to reduce

the truck discount. The truck-barge alternative to rail shipments is very viable, not only in the transportation market to the Gulf, but also in the market to eastern United States flour mills.[3]

As appears obvious from this example, historically grain which originated on rail must terminate on rail and grain which originated on truck must terminate on barge to be competitive at destinations to which barge transport is available.

The transit rate structure employed by railroads permits a somewhat unique wheat handling network. As farmers harvest their wheat, they haul most of it to the closest country elevator. Almost all these elevators are located on railroad lines. By using single-car railroad rates which employ transit privilege, elevators send wheat to inland terminals as it is sold by farmers or, if their elevators are full, as it arrives for storage. Inland terminals, located at Salina, Topeka, Hutchinson, Wichita, Atchison, and Kansas City provide space to supplement on-farm and country elevator storage.

In addition to storage, inland terminals provide alternative markets for a farmer's wheat. Rail rates employing transit privilege make it possible for country elevators to buy grain and simultaneously sell it in any of several markets even if the grain is already in an inland terminal elevator. If the grain is still in country elevators, single-car rates allow the managers to sell small quantities as they are purchased and ship to purchasers without worrying about hedging the grain on the futures market or about the price risk inherent in carrying it unhedged

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[3]Michael W. Babcock, "Potential Impact of Railroad Deregulation in the Kansas Wheat Market," Unpublished paper, Dept. of Econ., Kansas State University, February 1981, pp. 2-3.

while they accumulate volumes of grain large enough for a multiple-car shipments.

Kansas Wheat Flows

A 1977 study of grain flows conducted by Kansas State University showed that over 90 percent of the wheat produced in Kansas moved through a country elevator.[4] About 70 percent of the wheat shipped from these elevators went to inland terminal elevators in the state.[5] About 15 percent was shipped directly to Gulf ports for export, while 5 percent moved to flour mills in the state.[6] The remainder moved to locations outside the state, primarily to inland terminals in Oklahoma and Texas.[7]

Of the wheat shipped from Kansas terminal elevators, over 50 percent moved to the Texas Gulf for export while another 3 percent moved to Louisiana ports. Over 25 percent moved to Kansas and Missouri flour mills, while the rest (about 20 percent) moved primarily to eastern flour mills.[8] At least one-half of the wheat produced in Kansas is currently being exported from the Gulf of Mexico and most of this grain makes intermediate stops at country elevators and at inland terminals.

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[4]John H. Davis, "Kansas Grain Flows and Transportation Modes During 1977," Unpublished Masters Report, Kansas State University, 1980, p. 20.

[5]Ibid., p. 23.

[6]Ibid., p. 120.

[7]Ibid., pp. 133-136.

[8]Ibid., pp. 57-59.

V. TRANSPORTATION REGULATION

Grain transportation in Kansas relies on three of the five major transport modes--railroads, trucks, and barges. The modes are closely interdependent. Consequently, regulation or deregulation for one mode will have a direct effect on the other two.

Modes of Transportation

There are also many differences in the three modes of transportation. Railroads have the largest capital investment per firm and are the most highly regulated of the three modes of grain transportation. Railroads have their own rights-of-way and terminal facilities and are responsible for their maintenance.

But railroads have two distinct advantages in moving grain. First, railroads have no competition with other vehicles on rail lines. This permits the use of long trains which are able to carry large loads efficiently, as several locomotives are joined to pull a higher tonnage than would be possible using each locomotive individually. Finally, the low friction generated between steel rails and steel wheels enables trains to operate over long distances with relatively low energy costs. Steel on steel also produces low traction. This fact points to the importance of keeping a train moving once it has started.

A unit train meets this criterion. In addition to this, a unit train can match power with load more effectively. Once a unit train is loaded, it can move directly to its destination to be unloaded and returned without stopping in a railroad yard to classify individual cars or to assemble and dissemble efficient-sized trains.

Rights-of-way for trucks are publicly owned and maintained. A trucking firm can enter and exit from the transportation market much easier than could a railroad because of the lower initial investment. For this reason the trucking industry has a more competitive structure than the rail industry. Indeed, the reason for regulation of trucking was to control entry and provide more rate and service stability to the industry. Since motor carriers of grain are exempt from most regulation, we would expect them to be highly efficient in their operations reflecting the discipline of intense competition.

But trucks need to be more efficient because of inherent cost disadvantages relative to railroads. Since they share the highways with automobiles, trucks cannot safely be as long as trains. In addition, there is more friction between rubber and pavement than between steel and steel. Thus, trucks have higher operating costs which offset their lower terminal costs, especially on long hauls. On short hauls (under 200 miles) motor carriers provide viable competition with railroads for grain transportation.

Inland water transportation has the advantage, along with trucks, of public ownership and maintenance of right-of-way. It also has the ability to use large barge tows safely and has the advantage of the low operating costs inherent in water transportation.

Water transportation has several distinct disadvantages however. First, barge transportation is slow and circuitous. This circuity is especially evident in Kansas grain transportation, where the grain must move to the Mississippi River before going on to the Gulf ports. This not only raises mileage traveled for the same service, but also raises inventory costs in transit. Frozen rivers can close down barge transportation

and floods can do likewise. Drought can serve to reduce the size of loads which can navigate shallow river channels. Finally, water carriers can serve only a few points, so they must depend on other modes of transportation for assembly and distribution of freight. Barges provide intermodal competition for railroads on long hauls where water transportation is available. For example, rail rates, per hundredweight per mile for grain shipments north to south along the Mississippi River corridor, are, on the average, 50 percent of the rates for shipping the same grain west to east where little intermodal competition exists.[9]

Historical Look at Transportation Legislation

With this background into the transportation system for Kansas wheat, it is now possible to be more specific about its regulation.

According to Harper:

> "Government economic regulation of transportation is regulation of the business of transportation and includes control over entry into the business of for-hire transportation, control over exit from the business, regulation of rates and fares, regulation of carrier service, regulation of accounting practices, regulation of financial matters including security issues, control of mergers and consolidations, and, of course, the filing of numerous reports covering the activities of the regulated carriers."[10]

The regulatory principles which apply to transportation were conceived around the turn of the century. At that time, long distance transportation was dominated by railroads which require very high initial

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[9]Michael V. Martin, "U.S. Transportation Policy: Inland Waterways," Transportation Policy Primer, National Extension Transportation Task Force Publication No. 4, March, 1980, p. 73.

[10]Donald V. Harper, Transportation in America, Users, Carriers, Government, (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1978), p. 420.

investments to establish routes. It was the textbook case of a natural monopoly, much like utility companies. There was little economic justification for two railroads when one could do just as well. These railroads were publicly sanctioned and supported as monopoly enterprises which were protected from competitors producing substitute services and were in turn regulated to prevent abuse of monopoly power. The Interstate Commerce Commission (ICC) provides regulation and sanction for the three modes of grain transportation.

The laws in the United States created a transportation system which is based on a common carrier service. Common carriers receive the privilege to operate in the transportation business under public sanction in return for the promise of performing services fulfilling four basic duties: a) to carry all goods and persons offered, within the limits of facilities, equipment, and routes; b) to provide for safe delivery of goods and persons placed in their care; c) to treat all customers without discrimination; and d) to charge reasonable rates for these services.[11]

Under historic procedures, regulatory bodies reviewed rate proposals of common carriers to determine if the rates were reasonable. A certificate of public convenience and necessity was required before a common carrier can begin, change, or end transport services. This certificate shows that the applicant is fit, willing, and able to perform the services and that public convenience and necessity demand the change in service.

While this certification can serve to eliminate costly duplication of services which are not needed, it can also be used to limit entry of firms which are needed for public convenience and thus to preserve monopoly

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[11]Dudley F. Pegrum, Transportation: Economics and Public Policy, (Homewood, IL: Richard D. Irwin, Inc., 1973), p. 100.

profits of established firms. The problem of entry limitation was especially evident in the trucking industry which is not a natural monopoly.

While common carriers are important transportation providers, they are not the only for-hire carriers. Contract carriers contract with one or a few shippers to perform regular transportation services. The Interstate Commerce Commission also regulates these carriers, but they are not required to fulfill the four duties of a common carrier. Exempt for-hire carriers of agricultural commodities are also very important to grain transportation in the United States. Private carriers are non-transport businesses that haul their own freight.

Motor carriers may be common, contract, exempt, or private carriers. Unlike railroads, most motor carriers of grain are private or exempt carriers (carriers of agricultural commodities which retain "substantial identity" of the raw form). These two types of motor carriers are largely exempt from regulation.

Bulk commodities, (e.g., grain) are exempt from regulation when carried by water. Thus, market forces of supply and demand are allowed to operate more freely to determine barge rates and service conditions.

The basic objective of regulation has been to provide the public with adequate transportation service at a reasonable cost. It was feared that transportation, if left to itself, would not operate effectively and in the public interest because railroads would tend toward monopoly, while barge and truck lines could tend toward destructive competition.

The history of transportation regulation in the United States as it has affected wheat transport pertains largely to regulation of railroads. Railroad regulation will be reviewed here.

The main reason for regulation of railroads was to stop the malpractices of which railroads were accused. The latter part of the nineteenth century was a period of laissez-fare on the part of the government, and railroad managers exploited the situation. Railroads were charging high rates by exploiting their monopoly position. They were also charged with unjust discrimination in pricing and in service. Another complaint was railroad rates fluctuated so much that users were unable to plan their transportation costs in advance. This problem was especially prevalent when two or more railroads were competing in an area. The railroads recognized the problem this caused for them, so they began to fix rates among themselves and then divided the available traffic. Another way the railroads eliminated competition was by simply buying or merging with a competitor, thus creating a monopoly.[12]

These practices led to the "Granger Laws" which were enacted in Illinois, Iowa, Minnesota, and Wisconsin between 1871 and 1874.[13] These laws did not work well and in 1886, the Supreme Court held that a state could not control rates on interstate traffic. The next year, Congress enacted the Interstate Commerce Act which is still in force today, although many times amended. The Act, which covered all common carrier railroads: required reasonable rates, prohibited personal discrimination, required publication of rates, and established the Interstate Commerce Commission (ICC) to administer the law.[14]

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[12] see also Harper, pp. 421-426.

[13] Pegrum, p. 270.

[14] Ibid., pp. 276-277.

The Act of 1887 was most extensively modified by the Transportation Act of 1920. It added to the rate regulation powers of the ICC and gave the ICC power over railroad abandonments. Just because a rail line is unprofitable does not mean it can automatically be abandoned. A decision to abandon a rail line must "balance the interest" of the railroad and of the public being served. The Transportation Act of 1920 represented a slight departure from the earlier acts because it recognized the railroads' need for adequate revenue and thus empowered the ICC to set minimum as well as maximum rates. The Reed-Bulwinkle Act of 1948 legalized rate bureaus.[15]

Rate bureaus are associations of the common carriers operating in a certain area organized for the purpose of jointly determining rates. These rate bureaus request rate changes and publish rail tariff rates. The ICC must give final approval to these rates after a public review. The ICC has not permitted rates so low as to encourage cutthroat competition nor so high as to be an obvious abuse of monopoly power.

The reasons for regulation of motor carriers were much different than those for regulation of railroads. Regulation of trucks came not at the request of the public, but at the demand of truck operators who wanted to be protected from excessive competition and from the regulated railroads who demanded that their competitors be treated likewise.

The Motor Carrier Act of 1935 was the motor carrier equivalent of the Interstate Commerce Act of 1887, but since carriers of grain were given exemption from the Act, regulation has had relatively less impact on for-hire carriers of grain.

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[15]Harper, p. 420.

The Transportation Act of 1940 regulated water transportation for many of the same reasons that trucks were regulated. Once again, grain was an exempt commodity except under special conditions.

The Staggers Act

The Staggers Rail Act of 1980, which was signed into law on October 14, 1980, represents an attempt by Congress to relax some of the regulations on railroads and to allow them to respond to intermodal competition, while at the same time creating a new level of intramodal competition. While the term "deregulation" is often used to describe this Act, it does not mean that we now have a completely unregulated, competitive market. There are four provisions of the Staggers Act which differ substantially from previous legislation.

The first provision relates to reasonable rates. The reasonableness of railroad rates will be subject to review by the ICC only if two conditions exist. The first condition is that rates in question produce a ratio of revenue to variable costs of 1.6 or more in 1980 with increases in the ratio to 1.8 by 1984. The second condition is that the railroad which establishes the rate is "market dominant" (has no effective competition for the traffic). This means that even if a railroad has an actual monopoly, its rate would not be challenged unless it was greater than 160 percent of variable cost. The rate could be greater than this ratio if there was a competitor in the market. In addition, rates which do not cover out-of-pocket costs are now prohibited.

Secondly, shippers and carriers are now permitted to negotiate individual contracts for rates and services. These contracts can not be discriminatory and no more than 40 percent of any car type can be devoted

to agricultural contract service. This limit can be circumvented by requiring shippers to provide cars.

The third provision stimulates competition among railroads. Multi-carrier discussion of single line rates through rate bureaus are now prohibited. Even on joint rates, only railroads which actually carry traffic may participate in rate decisions after 1983.

Finally, rail abandonment procedures are expedited somewhat and more options are made available to the shippers on a potentially abandoned line. A special surcharge may be applied to light density lines to help carriers offset high costs. Communities may now purchase lines which are proposed for abandonment.

VI. TRANSPORTATION RATE CHANGES FOR WHEAT SHIPPED FROM KANSAS

The Staggers Act has caused and will continue to cause changes in railroad operations. It is the purpose of this chapter to examine the current changes and their implications for the future. Shippers will need to be able to react to these changes and find the lowest cost method of shipment available to them.

Volume Rates from Inland Terminals

One of the first reactions of railroads in Kansas to the Staggers Act was to publish minimum volume rates from Kansas City to the Gulf of Mexico. These rates applied to grain originated at Atchison, Topeka, and Kansas City. There were two basic types of volume rates. The first called for a 350,000 ton minimum annual volume at a rate of 78 cents per hundredweight (46.8 cents per bushel). The second called for a 150,000 ton minimum annual volume at a rate of 87 cents per hundredweight (52.2 cents per bushel).[16] These rates did not require the grain to have arrived at Kansas City by rail to receive the reduced rate, i.e., no previous billing was required.

Table 4 shows the average single-car transit balances for transporting wheat from Kansas City to the Gulf. The average transit balance on December 31, 1980 was 47 cents per bushel. This table shows that volume rates from Kansas City were not designed to capture a larger share of the rail market after grain had reached an inland terminal. Instead, it was an attempt by individual railroad companies to draw trucked grain from origins which were not located on the company's lines. It was also an

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[16]Statement by Vic Lewerenz, personal interview, May 5, 1981.

Table 4. Average Transit Balances from Kansas City to the Texas Gulf

Date	Through Rate	Gathering Rate	Transit Balance
	----------(cents per bushel)----------		
01/01/75	44.5	22.5	22.0
03/27/75	47.5	24.0	23.5
06/20/75	50.5	25.5	25.0
10/11/75	52.0	26.0	26.0
10/07/76	54.5	27.5	27.0
01/07/77	56.5	28.5	28.0
11/30/77	59.5	30.0	29.5
06/17/78	61.0	31.0	30.0
12/15/78	65.5	33.0	32.5
06/05/79	66.5	33.5	33.0
07/28/79	67.5	34.0	33.5
09/14/79	68.0	34.5	34.0
10/15/79	77.0	38.0	39.0
02/27/80	78.5	39.0	39.5
04/01/80	82.0	40.5	41.5
07/12/80	88.0	43.5	44.5
12/30/80	92.0	45.0	47.0

From a random sample of 63 Kansas points. Rates obtained from "Grain Rate Books Nos. 34-45 and appropriate Supplements", Transportation Department, The Board of Trade, Kansas City Missouri, Inc.

attempt by the railroads to capture a share of the truck-barge traffic by directly competing with barges for the available trucked grain in the market where railroads were most competitive. The distance to the Gulf by railroad from Kansas City is much shorter than the distance by barge so the railroads can compete effectively in this market, even though their costs per ton-mile are higher than for barges.

Influence on Transport Mode

Table 5 provides evidence that the railroads have accomplished their goal of more direct competition with barge movement. The lower half of the table, which compares shipments by year during the months of April, May and June, shows that the percentage of barge shipments during 1981 is the lowest since 1978. This reverses the historic trend of railroads losing traffic to barges. In 1981, the percentage of total traffic handled on barges is substantially lower than for the previous two years.

The primary reason for a truck discount at Kansas City on wheat to be shipped to the Gulf is now eliminated. Trucked grain is no longer at a disadvantage relative to grain which arrived by rail in subsequent rail transport to the Gulf.

A method of examining the effect of the volume rates to the Gulf on the Kansas City wheat market is to examine the mode of transport of Kansas City's receipts. If volume rail rates make trucks more competitive in the Kansas City market, we would expect to see more wheat moved into Kansas City by truck. Table 6 shows that this is the case. In the first four months after the volume rates went into effect, almost half of the wheat receipts at Kansas City were by truck. This compares to an annual four month average from 1975 to 1980 of less than 25 percent truck receipts and to a previous high of 40 percent in 1979.

Table 5. Wheat Shipments by Mode from Kansas City

Period and Mode	1975	1976	1977	1978	1979	1980	1981
January-December:	(000 bushels)						
Rail	70,191.1	50,524.4	48,582.7	62,223.8	50,516.8	37,560.6	
Truck	243.1	377.2	444.6	54.8	52.8	114.3	
Barge	11,989.4	12,250.1	15,638.2	13,794.8	16,192.3	14,079.4	
TOTAL	82,423.6	63,151.7	64,665.5	76,073.4	66,761.9	51,754.3	
	(percents)						
Rail	85.16%	80.00%	75.13%	81.79%	75.67%	72.57%	
Truck	.29	.60	.69	.07	.08	.22	
Barge	14.55	19.40	24.18	18.13	24.25	27.20	
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
April-June:	(000 bushels)						
Rail	11,562.2	9,643.2	8,392.0	16,234.1	7,591.3	4,680.5	12.652.1
Truck	.2	309.3	243.8	5.8	.9	29.3	0.0
Barge	3,347.2	3,715.7	5,187.1	2,586.0	5,667.1	5,306.9	2,274.4
TOTAL	14,909.7	13,668.2	13,822.9	18,825.9	13,259.3	10,017.0	14,926.8
	(percents)						
Rail	77.55%	70.55%	60.71%	86.23%	57.25%	46.73%	84.76%
Truck	.00	2.26	1.76	.03	.01	.29	.00
Barge	22.45	27.19	37.53	13.74	42.74	52.98	15.24
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 6. Wheat Receipts by Mode at Kansas City

Period and Mode	1975	1976	1977	1978	1979	1980	1981
January-December:				(000 bushels)			
Rail	100,180.00	101,907.60	82,071.00	75,048.00	71,875.10	71,909.90	
Truck	20,893.30	20,228.70	18,660.80	24,377.10	37,213.40	31,991.60	
TOTAL	121,073.30	122,136.30	100.731.80	99,425.10	109,088.50	103,901.50	
				(percents)			
Rail	82.74%	83.44%	81.47%	75.48%	65.89%	69.21%	
Truck	17.26	16.56	18.53	24.52	34.11	30.79	
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
January-April:				(000 bushels)			
Rail	20,449.00	23,451.30	21,664.60	15,371.90	12,626.80	19,160.4	9,171.60
Truck	3,590.80	4,166.20	4,427.60	5,815.80	8,387.90	7,074.10	9,083.10
TOTAL	24,039.80	27,617.50	26,092.20	21,187.70	21,014.70	26,234.50	18,254.70
				(percents)			
Rail	85.06%	84.91%	83.03%	72.55%	60.09%	73.04%	50.24%
Truck	14.94	15.09	16.97	27.45	39.91	26.96	49.76
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Mileage-Based Gathering Rates

Railroads instituted new gathering rates beginning in late April to compete directly with trucks for the traffic from country points to Kansas City. Previously, railroads had met truck competition, not directly, but by charging a relatively high gathering rate which would be offset by the lower balance of the through rate on later movements. Since both trucked grain and grain which originated by rail now had essentially the same rate on movements from Kansas City to the Gulf, the lower truck rates on movements from country points now were cutting into the railroads' share of this market.

Unlike previous rate changes, which merely adjust (usually upward) existing rates by a certain percentage, these new gathering rates were restructured and adjusted to a route-mileage base. The Union Pacific Railroad rates which became effective on April 25, 1981 are 25 cents per hundredweight for the first 100 miles and 1 cent per hundredweight for each additional mile.[17] These rates are now in effect from Kansas origins to Kansas City, Topeka, and Salina. A random sample of 15 Kansas origins showed that these new rates averaged over 30 percent less than the old through rates with a range from 53 percent to 8 percent less.

On May 10, 1981 the Missouri Pacific Railroad Company followed suit by publishing mileage-based gathering rates between Kansas points which would not be accorded transit, diversion, inspection, or reconsigning between the points (country to Kansas City). The freight bills may be used to support later proportional, flat or transit balance rates.[18] These rates

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[17] from Supplement No. 3 to "Grain Rate Book No. 45," Transportation Department, The Board of Trade, Kansas City, Missouri, Inc.

[18] Supplement No. 5.

averaged 31 percent less than the old gathering rates, with a range of 19 to 47 percent. At the same time the Missouri Pacific instituted 25-car export rates from Kansas country points which averaged 17 percent less than previous single-car through rates from country elevator locations in Kansas with a range of 14 to 26 percent less.

On May 27, 1981 Burlington Northern Incorporated published new gathering rates to Kansas City which were basically the same as the Union Pacific rates. These rates allowed for no inspection in transit and the freight bill applies only on subsequent movements via the Burlington Northern.[19] These rates averaged 23 percent less than previous single-car through rates with a range of 9 percent more to 40 percent less. The innovation of applying previous billing only to subsequent moves on the Burlington Northern was an attempt to keep the traffic that railroad originated.

On May 18, 1981, the Missouri-Kansas-Texas Railroad Company (MKT) published its new gathering rates to Kansas City which represented an average reduction of 35 percent from the previous gathering rates with a range of 22 to 47 percent. It also instituted 25-car rates from Kansas points which were 22 percent below single-car through rates with a range of 14 to 29 percent.[20]

The Cotton Belt joined the move to mileage-based rates to Kansas City on June 10. These rates did not allow transit or inspection in route, but the bills could be recorded at destination.[21] These gathering rates were

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[19]Supplement No. 6.

[20]Supplement No. 7.

[21]Supplement No. 9.

36 percent lower than previous rates with a range of 16 to 52 percent. The Cotton Belt also published 30-car export rates from Kansas points which were 19 percent less than single-car through rates with a range of 6 to 30 percent.[22]

The Atchison, Topeka and Santa Fe Railway Company used a different method of reducing rates. The Santa Fe's actions are an excellent example of what competition among railroads can mean. On April 18, 1981 it instituted new 30 and 60-car export rates on grain from Kansas points.[23] This was an attempt by the Santa Fe to meet the truck-barge competition in the old manner, with lower export rates, rather than by first meeting barge competition and then truck competition as separate markets. The multiple car rates averaged 20 percent less than previous single-car through rates on wheat with a range of 13 to 29 percent. The Santa Fe not only initiated unit-train rates from country points, but also was the first railroad to reduce its gathering rates. It reduced gathering rates on April 22 by an average of 8 percent, with a range of 7 to 9 percent. These rates were not based on mileage, but were adjustments to previous rates and did not allow for inspection in transit.

On June 11, following the lead of other railroads, the Santa Fe issued rates between Kansas points which were based on mileage. These rates did not allow for in-transit inspection, reconsignment or diversion, but the bills could be recorded for transit at destination.[24] These rates were still substantially higher than those of its competitors (see Table 8).

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[22]Supplement No. 10.

[23]Supplement No. 4.

[24]Supplement No. 13.

The Santa Fe then adjusted its rates on June 25 to meet those of its competitors mainly at those points served by other railroads.[25] An example at Concordia will help illustrate this.

Table 7. Rail Rates from Concordia to Kansas City

Railroad[1]	Distance	Old Rate	Mileage Rate	New Rate
	--miles--	-------- cents per hundredweight ---------		
UP	212	75	48	
MP	202	75	48	
AT	249	75	70	48

[1]Railroad abbreviations are as follows: UP = Union Pacific; MP = Missouri Pacific; AT = Atchison, Topeka and Santa Fe.

[25]Supplement No. 20.

The regression equations in Table 8 provide evidence that these new gathering rates were set to meet truck competition. Compare those equations with equations for truck costs for hauling grain estimated by various authors.

Truck costs = 6.7 + .088 (miles)[26]

Truck costs = 3.54 + .094 (miles) - .000045 (miles^2)[27]

While these equations are not equal, they are much closer than are the rail rate equations compared to the equations obtained from estimated variable rail costs.

Rail variable costs = 7.41 + .023 (miles)[28]

Rail variable costs = 5.65 + .031 (miles)[29]

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[26]from Table 24, L. Orlo Sorenson and Stephen W. Fuller, "Alternative Export-Wheat Distribution Systems for the Southern U.S. Plains," (Study No. DOT-FR-65104, for the Federal Railroad Administration, 1980), p. 24. Equations are of the form $y=a+bx+cx^2$ where "y" equals costs in cents per bushel for hauling grain and "x" equals miles traveled. Letter "a" represents the y intercept of the regression line and "b" and "c" represent slopes.

[27]Marc A. Johnson and Gary M. Mennem, "Market Area Sensitivity as a Measure of Railroad-Barge Competition in the Oklahoma-Kansas Wheat Transportation Market." Southern Journal of Agricultural Economics, 8(1976): p. 118.

[28]Thomas P. Drinka, C. Phillip Baumel, and John J. Miller, Estimating Rail Transport Costs for Grain and Fertilizer, University of Missouri-Columbia Agricultural Experiment Station Research Bulletin 1028, June 1978, p. 21.
equation estimated from Sioux City, Omaha, Dubuque, Keokuk and Kansas City, $R^2=.978$.

[29]Estimated by Michael Babcock from ICC, Bureau of Accoounts, Railroad Cost Scales 1977, (Washington, D.C.: U.S. Government Printing Office, 1979).

Table 8. Mileage Rates by Distance for Shipment of Wheat from Kansas Origins to Kansas City

MILES	RAILROAD[1]					
	UP	MP	BN	Cotton Belt	AT	MKT
	(cents per hundredweight)					
50	25	26	25	28	39	26
100	25	31	25	33	45	30
150	35	36	35	38	50	36
200	45	44	44	43	58	44
300	65	64	64	62	78	-
400	85	84	84	83	98	-
	280	285	277	287	368	136
	Regression Equations[2]					
	(cents per hundredweight)					
	10.200 +.182x	13.610 +.169x	10.590 +.186x	16.300 +.158x	27.100 +.170x	19.000 +.120x
	(cents per bushel)					
	6.120 +.109x	8.170 +.101x	6.350 +.122x	9.780 +.095x	16.260 +.102x	11.400 +.072x
R^2	(.980)	(.982)	(.957)	(.973)	(.985)	(.978)

[1]Railroad abbreviations are as follows: UP = Union Pacific; MP = Missouri Pacific; BN = Burlington Northern; AT = Atchison, Topeka and Santa Fe; MKT = Missouri-Kansas-Texas.

[2]Regression equations and R^2 were estimated using simple linear regression on the rates in the table. Regression equations are in the form $y=a+bx$ where "y" represents the rates in the table, "x" represents the miles, "a" represents the y-intercept of the regression line, and "b" represents the slope.

Influence on Transport Mode

Table 9 provides a check on the results of railroads' attempts at meeting truck competition for transporting grain to inland terminals in the state. Comparing the percentages in Table 9 with those in Table 6 shows that as a result of the railroads' new gathering rates, the historical modal division of truck and rail receipts at Kansas City has returned. Unlike the first four months of 1981 when almost half of the wheat receipts at Kansas City arrived by truck, in May and June (after new rail gathering rates were instituted) the historic division returned with the railroads carrying over two-thirds of the inbound wheat. The railroads have met the truck competition for carrying grain to Kansas City by the use of lower rates based on mileages.

Unit Train Rates from Inland Terminals

Inter-railroad competition has been the primary reason for the abundance of rate changes since the Staggers Act was implemented. While unilateral cutting of rates would increase a railroad's traffic and revenue, those rate cuts are almost certain to be followed by other railroads. In this case, revenue will be reduced to the entire railroad system, assuming that the traffic proportions will move back to previous levels. Thus, it seems irrational for railroads to cut rates. While this may be the case if all the railroads were competing in all the same markets, this is not the case if a railroad is only in one or two markets. Witness the MKT. In Kansas, it primarily runs from Kansas City south. Thus, it is not interested in traffic from country points and cannot capture much traffic at these points. For this reason, the MKT has been instrumental in minimum volume rates from Kansas City to the Gulf. As

Table 9. Wheat Receipts by Mode at Kansas City*

Period and Mode	1975	1976	1977	1978	1979	1980	1981
January-December:				(000 bushels)			
Rail	100,180.00	101,907.60	82,071.00	75,048.00	71,875.10	71,909.90	
Truck	20,893.30	20,228.70	18,660.80	24,377.10	37,213.40	31,991.60	
TOTAL	121,073.30	122,136.30	100.731.80	99,425.10	109,088.50	103,901.50	
				(Percents)			
Rail	82.74%	83.44%	81.47%	75.48%	65.89%	69.21%	
Truck	17.26	16.56	18.53	24.52	34.11	30.79	
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
May-June:				(000 bushels)			
Rail	12,455.50	21,693.90	16,905.30	12,325.20	10,017.30	10,539.70	11,622.90
Truck	3,288.50	4,164.80	3,274.00	5,142.10	5,234.20	3,784.3	5,249.90
TOTAL	15,744.00	25,858.70	20,179.30	17,467.30	15,251.50	14,324.00	16,872.80
				(Percents)			
Rail	79.11%	83.89%	83.78%	70.56%	65.68%	73.58%	68.89%
Truck	20.89	16.11	16.22	29.44	34.32	26.42	31.11
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 9. (continued)

Period and Mode	1975	1976	1977	1978	1979	1980	1981
January-June:	(000 bushels)						
Rail	32,904.50	45,145.20	38,569.90	27,697.10	22,644.10	29,700.10	20,794.50
Truck	6,879.30	8,331.00	7,701.60	10,957.90	13,622.10	10,858.40	14,333.00
TOTAL	39,783.80	53,476.20	46,271.50	38,655.00	36,266.20	40,558.50	35,127.50
	(Percents)						
Rail	82.71%	83.42%	83.36%	71.65%	62.44%	73.23%	59.20%
Truck	17.29	15.58	16.64	28.35	37.56	26.77	40.80
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

*May-June 1981 represents receipts after new gathering rates were instituted

other railroads match these minimum volume rates at Kansas City and other inland terminal cities, they try for some product differentiation at the same time. The Santa Fe instituted 30- or 60-car export rates. The Cotton Belt has 30-car export rates. The Missouri Pacific, Missouri-Kansas-Texas, and Kansas City Southern use 25-car export rates. The Burlington Northern has 60-car rates. The pattern of competition for multiple-car shipments from inland terminals has been this: very low rates for a huge minimum annual volume of grain (78 cents per hundredweight for 350,000 tons, 87 cents per hundredweight for 150,000 tons), followed by multiple-car rates which aren't as low (Santa Fe 30/60 car rates at 101 cents per hundredweight); these rates are then matched or lowered with a smaller unit shipment (25 cars). There are two ways to attract business--lower price or improved service. Improved service to shippers in the case of railroads is smaller unit shipments (25 vs 60 cars) or smaller annual volume (50,000 tons vs 350,000 tons).

Table 10 gives examples of some of the new rates out of inland terminals and illustrates these points. This is not to say that competition is the sole cause for rate reductions. It only means that rail deregulation provided the atmosphere for competitive rate cutting as well as cost saving efficiency.

Multiple car shipments utilize many operating economies. They 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.[30] For example, as compared to the

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[30] L. Orlo Sorenson, "Grain Transportation," syllabus prepared for U.S. Grain Marketing System Short Courses, Kansas State University, 1980, p. 36-37.

Table 10. Unit-train Rates from Kansas Inland Terminals to Texas Gulf Points

Date[1]	12-31-80	4-08-81	5-10-81	5-10-81	5-10-81	5-10-81	6-05-81
Railroad[2]	ALL	AT	MP	MKT	KCS	Cotton Belt	BN
Number of cars per shipment	1	30/60	25	25	25	30	60
Inland Terminal	Rates						
	(cents per hundredweight)						
Atchison	145	101	122				
Hutchinson	145	120	120				
Kansas City	145	101		101	101		101
Salina	146	126	126				
Topeka	145	101	122			101	
Wichita	133	115	108				98

[1]Date initiated

[2]Railroad abbreviations are as follows: AT = Atchison, Topeka and Santa Fe; MP = Missouri Pacific; MKT = Missouri-Kansas-Texas; KCS = Kansas City Southern; BN = Burlington Northern.

previous system of rail transportation to the Gulf, it has been estimated that an 80-car unit-train system running from inland terminals in the Southern Plains could reduce railroad variable costs from 30.2 cents per bushel to 19.7 cents per bushel.[31] If this is the case, cutting rates on multiple-car hauls may not only lower transportation costs to shippers but also increase profits to railroads by cutting their costs for providing essentially the same service. This is an example of the market place providing the signals for the least-cost, most efficient method of providing a service.

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[31]Sorenson and Fuller, p. 42.

VII. GRAIN TRANSPORTATION ISSUES FOR COUNTRY ELEVATOR SHIPPERS

Research at Midwestern universities has shown that unit trains are a more efficient means of long-distance grain transportation than are trains using single-car shipments.[32] These studies have looked at two possibilities: 1) using unit trains from existing inland terminals; and 2) using unit trains from inland terminals and subterminals, which are basically country elevators that have been upgraded to handle multiple-car shipments.

The Staggers Rail Act of 1980, which President Carter signed into law on October 14, 1980, provided the impetus for contract and unit-train rates for multiple-car shipments of wheat from Kansas to export points on the Gulf of Mexico. These reduced rates provide the incentive for shippers to use unit trains. Indeed, the current system of transporting wheat now employs unit trains from inland terminals to the Gulf of Mexico moving on published unit-train rates or contract rates.

Many country elevator managers are now considering the possibility of contracting for a reduced rail rate for volume shipments of wheat to the Gulf (a subterminal system). Contract rates present four types of risks not associated with unit train rates. First, they carry the risk of being undercut by subsequent published or contract rates. Second, if a shipper is not able to obtain the necessary volume of wheat required by the

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[32] Sorenson and Fuller, p. 7.
see also
Donald A. Hilger, and Bruce A. McCarl and J. William Uhrig, "Facilities Location: The Case of Grain Subterminals" American Journal of Agricultural Economics, 59(1977): 674-681.

contract, he faces substantial rate penalties. Third, a shipper is in effect locking himself into the market that his contract applies to. In the case of the Kansas wheat market, this is usually the Gulf export market. If the relationship between terminal prices and Gulf prices turns against him, he faces difficulties. Fourth, most existing contracts as of Fall, 1981 call for shippers to own or lease some of the cars which will move the grain called for in the contract.

But contract rates also present many opportunities for a shipper. The first is the opportunity to guarantee a lower transport charge than that of competitors--the inverse of the first risk. Another advantage is that of guaranteeing the number of cars needed. Most contracts carry a penalty for the railroad for failure to return a train within a given time period after loaded cars are presented for shipment. If a shipper already owns railroad cars, contract rates provide the opportunity to use these cars more efficiently. The greatest incentive for using contract or unit-train rates is the opportunity they provide to expand trade area and volume by passing transportation savings on to customers in the form of a higher price for delivered grain. This opportunity is most apparent in an area where on-farm grain storage is abundant since the research cited earlier has determined that a subterminal shipping export wheat from the Great Plains is not able to divert grain stored in a country elevator located on a rail line from shipment through an inland terminal.[33] However, a country elevator with substantially lower transportation charges may be able to attract a large percentage of this farm stored grain which was previously shipped by truck to inland terminals or other country elevators. Since

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[33]Sorenson and Fuller, pp. 32-36.

elevator income per bushel handled is normally constant, elevators have opportunities to increase profits by handling a larger volume of grain, provided that marginal costs do not rise to exceed unit revenue. Another opportunity for a subterminal is to retain part of the savings in transportation and still be more price competitive than before.

A country elevator shipper needs to answer many questions before considering entering into a contract. The first question is the cost of upgrading current facilities to handle volume shipments directly to destination. Sufficient railroad yard (siding) for handling the required number of cars is a prerequisite. High capacity train loading and truck unloading facilities are necessary since most multiple-car rates require loading a train in twenty-four hours. A further problem involves identification of the minimum annual volume of grain a railroad will require before considering a contract. This may vary greatly among carriers. Additional important questions are these: what percent of the required minimum annual volume is currently handled by the elevator; and, is there enough grain on farms and in neighboring elevators with no rail service to justify the additional investment? Other questions are: what will car ownership cost; what car lease arrangements are available; what margin is available on the additional grain to be handled; and what minimum margin is necessary for competitive rewards to resources employed? This last set of questions may only be answered on an individual basis. The answers will not be addressed in this paper; however, this makes them no less important to a management decision process.

Considerations which do apply to all shippers whether or not they are considering contract rates are: how have relative transportation charges among markets and among modes of transport changed following passage of the

Staggers Act; and, how do these changes reflect on marketing options which may include individually negotiated transportation service and rate contracts?

The following example illustrates the effect of railroad rate changes on transport options at Herington, Kansas in May, 1981. Assume that on May 5, the July wheat futures contract price is $4.00 per bushel. On May 5, trucked wheat of contract quality arriving in Kansas City was priced 20 cents per bushel below July futures; railed grain was 12 cents per bushel below; and the same quality wheat delivered at Gulf ports on the same day was priced 33 cents per bushel above July futures. Transport charges from Herington on the same date were 26 cents per bushel to Kansas City by truck, 49 cents by rail and 89 cents to the Gulf ports by rail. The Kansas City truck bid less transportation charges was the best alternative (Herrington net price, $3.54) as illustrated below:

	KC Truck	KC Rail	Gulf Rail
Destination price	$3.80	$3.88	$4.33
less transport charge	- .26	- .49*	- .89*
Herington net price	$3.54	$3.39	$3.44

* Ex Parte 386

A potential rail contract rate from Herington to a Gulf port of 68 cents per bushel would have provided a net Gulf Price at Herington of $3.65 on the same date, which is 11 cents per bushel higher than the next-best option, assuming all other conditions remain the same. This difference of 11 cents may be enough to compensate the shipper for risks

and other costs associated with the transportation contract if competitive transport conditions are relatively stable.

However, alternative charges may not be stable. Assume, for example that the rail rate from Herington to Kansas City is reduced to the level of truck charges and all other conditions remain the same. The contract gain over Kansas City rail is now only an unattractive 3 cents per bushel as illustrated below:

	KC Truck	KC Rail	Gulf Rail
Destination price	$3.80	$3.88	$4.33
less transport charge	- .26	- .26	- .68
Herington net price	$3.54	$3.62	$3.65

Historically, the net Gulf price at Herington has been about 5 cents per bushel higher than the net Kansas City rail price which in turn has been about 2 cents per bushel higher than the net Kansas City truck price.[34] Assuming a truck price in Kansas City of 37 cents per bushel below the July futures price with all other conditions the same as in the first example would approximate this historical situation as illustrated below:

	KC Truck	KC Rail	Gulf Rail
Destination price	$3.63	$3.88	$4.33
less transport charge	- .26	- .49	- .89
Herington net price	$3.37	$3.39	$3.44

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[34]Statement by Vic Lewerenz, personal interview, May 5, 1981.

In this case, a potential contract rail rate to the Gulf of 68 cents per bushel would net a Gulf price at Herington 26 cents per bushel higher than the next best option.

These illustrations show the effects of railroad reactions to the Staggers Act on a specific contract rate from Herington which initially appeared advantageous. After contract rail rates to the Gulf from Kansas City which required no prior billing became available, the bid for grain trucked to Kansas City from Herington increased relative to the Kansas City rail bid and the Gulf rail bid for Herington. This caused the net truck price to increase until it was higher than both the net rail price and the net single-car Gulf price. Thus, the net Gulf price from using a contract rate was no longer as superior to alternative net prices.

Mileage-based rail gathering rates based on trucking costs further eroded the initial savings of the potential contract rate. If similar rate and price changes were occuring at other inland terminals and country points in Kansas, it would now be more difficult for local elevators to pass on enough transport cost savings to make feasible multiple-car shipments direct to the Gulf.

The remainder of this paper will examine whether these circumstances are happening throughout the state since the relative positions of country elevator marketing and transportation options depends upon changes in transportation costs and upon intermarket price spreads.

VIII. SAVINGS OF NEW RAIL RATES FOR COUNTRY ELEVATOR SHIPPERS

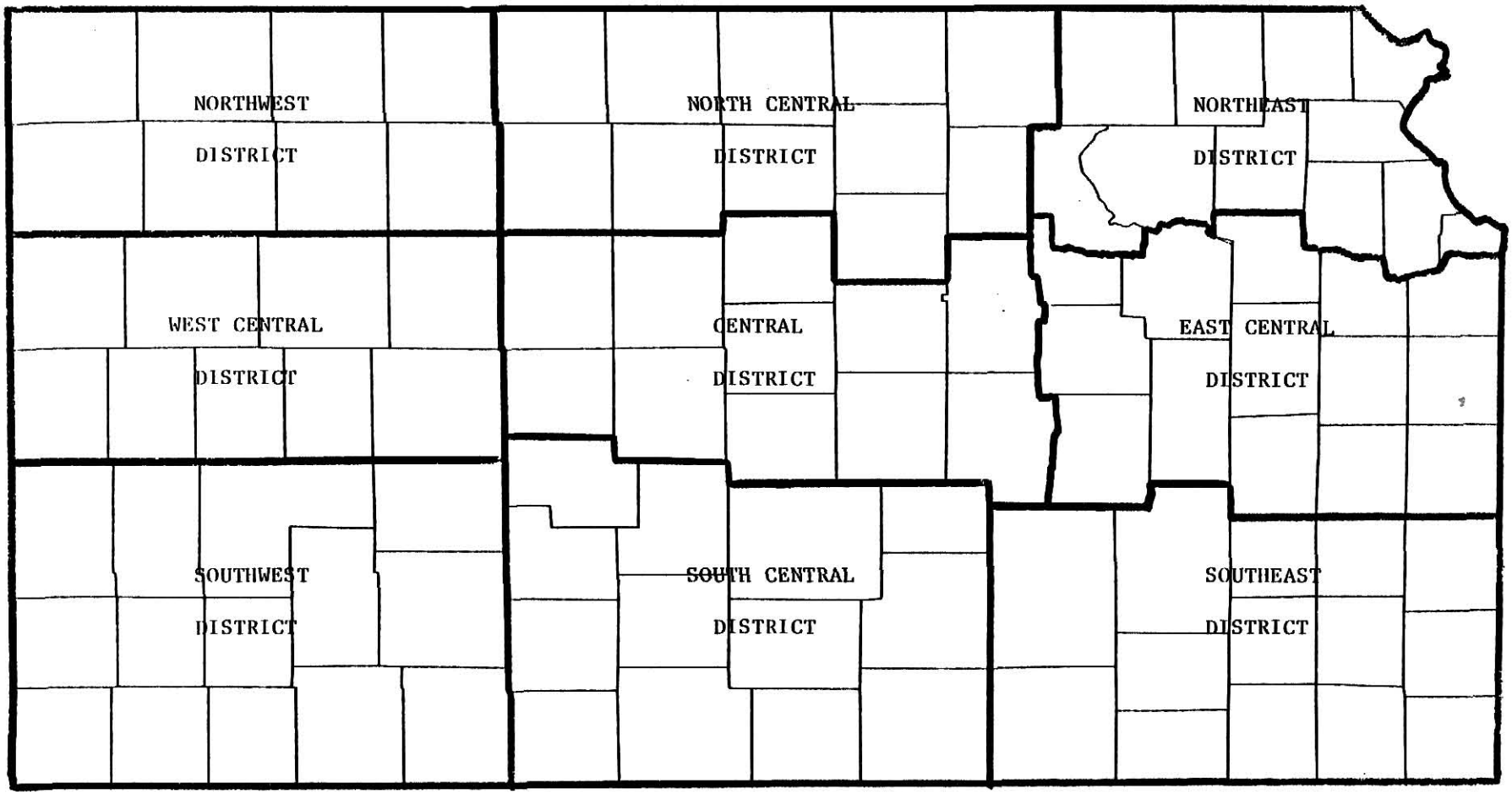
To examine the effects of new rail rates on transport charges for wheat shipments from country elevators to the Gulf, a sample of elevators from each crop reporting district in Kansas was examined. Figure 1 shows the nine crop reporting districts in Kansas. These districts provide a ready means for selecting a statewide sample by location. Within each district five cities were selected; first, to represent the rail lines in a district and second, to represent locations within a district.

Gathering Rates and Multiple-Car Rates from Inland Terminals

The single-car export rate (Ex Parte 386) for each country elevator was used as a base to compare with the combination of new gathering rates and multiple-car rates from inland terminals to the Gulf. Under the rail transit system in effect before deregulation, country points had export rates which would remain the same no matter which inland terminal in the state the grain stopped at in transit. If grain was bound for export, a shipper-owner could be indifferent as to which inland terminal grain was routed through.

After deregulation, rate differences require a shipper to calculate the least-cost route to the Gulf based on both the multiple-car rate from inland terminals to the Gulf and upon the transport charge from origin to the inland terminal. For example, assume a shipper located on the Missouri Pacific Railroad had a single-car export rate of 172 cents per hundredweight before deregulation. Assume also that after deregulation, the shipper can utilize a unit-train shipment from Kansas City at 87 cents per hundredweight or Wichita at 98 cents per hundredweight enroute to the

Figure 1. Kansas Crop Reporting Districts.



Gulf. Assume also that the shipper's rail rate to Kansas City is 92 cents per hundredweight and to Wichita is 60 cents per hundredweight. The shipper's least-cost route to the Gulf under the present system would be 158 cents per hundredweight, utilizing a unit train from Wichita. Under the transit balance system, both routes would have identical rates. Thus, it is necessary to include both unit-train rates from inland terminals and single-car gathering rates to terminals to calculate post-deregulation rates through all inland terminals to compare with prior single-car export rates.

Table 11 shows a representative sample of each crop reporting district and its single-car rail rate to the Gulf both before and after deregulation. The rates in this table and throughout the rest of this paper are quoted as published, ignoring any subsequent fuel surcharges. The first rate in the table is the old export rate (Ex Parte 386) for each country point. The remainder of the rates are based on single-car rates to terminals available and on multiple-car rail rates from the terminals to the Gulf. For all terminals except Kansas City, the best published unit-train rate in effect on July 1 was used (see Table 10). For Kansas City, however, a volume rate of 87 cents per hundredweight was used. In Kansas City, the volume rates apply to any shipper who can generate the minimum annual volume required. In other cities a contract rate only applies to a specific shipper, generally one who has already generated the volume for the rate in Kansas City. Kansas City has had these rates for a longer time than have other terminal cities, thus they are more widely used. If Kansas City's rate was 101 cents per hundredweight as published, very little grain would flow through Kansas City under post-deregulation rates. Kansas City's current receipts do not deviate substantially from historical

Table 11. Rail Rates for Export Wheat from Country Elevator Points through Various Inland Terminals

Origins	Railroad[1]	Rates				Change[3]	
			New Rates Routed Through				
		Old[2] Export	Kansas City	Topeka	Salina	Amount	Percent
		(cents per hundredweight)					
Northwest:							
Colby	BN,UP	188	170	171	172	-18	- 9.57
Hill City	UP	172	157	158	159	-15	- 8.72
Hoxie	UP	187	164	164	165	-23	-12.30
Norcatur	BN	176	167	NA	NA	- 9	- 5.11
Norton	BN	175	167	NA	NA	- 8	- 4.57
District Average		179.6				-14.6	- 8.05
North Central:							
Beloit	MP,UP	158	138	139	151	-20	-12.66
Concordia	AT,BN,MP	154	135	135	155	-19	-12.34
Kirwin	MP	171	151	193	NA	-20	-11.70
Minneapolis	AT,UP	154	132	132	151	-22	-14.29
Plainville	UP	159	150	151	152	- 9	- 5.66
District Average		159.2				-18	-11.33
Northeast:							
Frankfort	MP,UP	148	119	126	NA	-29	-19.59
Marysville	UP	158	122	126	NA	-36	-22.78
Sabetha	UP	158	131	131	NA	-27	-17.09
Valley Falls	AT	145	112	126	NA	-33	-22.76
Willis	MP	148	116	NA	NA	-32	-21.62
District Average		151.4				-31.4	-20.77

Table 11. (continued)

Origins	Railroad[1]	Rates						Change[3]	
			New Rates Routed Through						
		Old[2] Export	Kansas City	Topeka	Salina	Hutch-inson	Wichita	Amount	Percent
		(cents per hundredweight)							
West Central:									
Leoti	MP	172	179	181	178	172	158	-21	-12.21
Ness City	AT	158	173	175	NA	167	152	- 6	- 3.80
Scott City	AT,MP	171	168*	168*	168*	168	154	-17	- 9.94
Sharon Springs	UP	192	178	179	180	NA	NA	-14	- 7.29
Wakeeney	UP	175	157	157	159	NA	NA	-18	-10.29
District Average		173.6						-15.2	- 8.71
Central:									
Great Bend	AT	154	149*	149*	149*	149*	145	- 9	- 5.84
Hoisington	MP	154	151	153	155	149	133	-21	-13.64
Kanopolis	MP,UP	146	136	137	151	146	129	-17	-11.64
Marquette	MP	145	139	136	150	146	131	-14	- 9.66
Russell	UP	159	145	145	151	NA	NA	-14	8.81
District Average		151.6						-15	- 9.92
East Central:									
Centerville	MKT	143	115	NA	NA	NA	NA	-28	-19.58
Council Grove	MP	145	123	132	155	NA	NA	-22	-15.17
Osage City	AT,MP	145	120	127	157	155	133	-25	-17.24
Paola	BN,MP	145	112	132	166	NA	138	-33	-22.76
Strong City	AT	145	125	146	NA	NA	143	-20	-13.79
District Average		144.6						-25.6	-17.71

Table 11. (continued)

Origins	Railroad[1]	Rates						Change[3]	
			New Rates Routed Through						
		Old[2] Export	Kansas City	Topeka	Salina	Hutch-inson	Wichita	Amount	Percent
		(cents per hundredweight)							
Southwest:									
Bucklin	StLSW	154	155	NA	NA	NA	NA	-	-
Dodge City	AT	158	153*	153*	NA	153*	152	- 6	- 3.80
Meade	StLSW	148	163	NA	NA	NA	NA	-	-
Satana	AT	148	150*	150*	NA	150*	150*	-	-
Syracuse	AT	172	160*	160*	NA	160*	160*	-12	- 6.98
District Average		156						- 3.4	- 2.16
South Central:									
Anthony	AT,MP	123	NA	NA	NA	NA	124	-	-
Coldwater	AT	145	NA	NA	NA	138*	138*	- 7	- 4.83
Haven	MP	145	143	157	159	144	123	-22	-15.17
Pratt	AT,StLSW	154	145	NA	NA	140*	140*	-14	- 9.09
Stafford	AT,MP	154	159	NA	NA	140*	129	-25	-16.23
District Average		144.2						-13.6	- 9.06
Southeast:									
El Dorado	AT,MP	133	131	NA	NA	NA	123	-10	- 7.52
Humbolt	AT	143	122	NA	NA	NA	150	-21	-14.69
Parsons	MKT	129	121	NA	NA	NA	NA	- 8	- 6.20
Pittsburg	AT,BN,MP	133	120	NA	NA	NA	NA	-13	- 9.77
Yates Center	MP	133	122	NA	NA	NA	127	-11	- 8.27
District Average		134.2						-12.6	- 9.29

* New single-car export rate.

NA = The railroad does not pass through a terminal or the cost is prohibitive.

[1]Abbreviations as follows: AT = Atchison, Topeka and Santa Fe; BN = Burlington Northern; MKT = Missouri-Kansas-Texas; MP = Missouri Pacific; StLSW = St. Louis and Southwestern; UP = Union Pacific.

[2]Old Export is the single-car export rate on December 31, 1980 (Ex Parte 386).

[3]Difference between "old export" and minimum charge routing incorporating volume rates from inland terminals and mileage based gathering rates to inland terminals.

levels (see Table 9). The rate of 87 cents per hundredweight will result in grain flows, based on minimum rail transport charges, from country elevators to inland terminals which approximate historical flow patterns.

The rates from country points to terminals were based on the least-cost mileage scale of railroad rates available to that shipper and upon railroad mileage calculated from the 1980 Railroad Map of Kansas. Both the least-cost mileage scale and the terminals available to a shipper are functions of the railroad line or lines the shipper is located on. It was assumed that grain could bypass a terminal city and continue to another with no rate penalty. This was especially important in relation to Hutchinson and Wichita. In other words, each rate in the table represents the lowest available railroad charge for transporting wheat from country points, through inland terminals, and finally to the Gulf.

The lowest post-deregulation rate was subtracted from the old export rate to arrive at differences or transportation savings for country elevators using new railroad rates. This difference was divided by the old export rate to arrive at a percentage change. The old export rates, differences, and percentage changes were averaged by reporting district to give an indication of which areas in Kansas have benefited more from railroad rate changes on export wheat.

These figures are based on railroad shipments. Due to the new environment, trucks may be used to bypass any highly circuitous rail route. Trucking short distances to an inland terminal is likely to become more important, but since rail gathering rates are based on trucking costs, rail shipments serve as an adequate method of comparison.

Because of relative scarcity of alternative transport, it was feared that some country points which are in the western part of the state would

be relative losers from deregulation. This sample tends to confirm that hypothesis because export rates from western origins are reduced less than rates from eastern origins. Gathering rates based upon trucking costs rather than rail variable costs will favor points closer to terminals since trucking costs are generally lower than rail variable costs for short distances and higher for longer distances. The ability of trucks to compete more effectively in the new environment adds to the advantage of being close to a terminal.

Table 11 shows that it is not just the distance from terminals which is important, but the distance from Kansas City. This phenomenon could be temporary or lasting. The problem of making a dynamic market appear static could be the cause for this observation. New multiple-car rates have come first to Kansas City. These rates are then followed by comparable rates at other terminals. Thus, rates from inland terminals to the Gulf at the point in time chosen are lower at Kansas City than at other terminals. Another point to be made is that the Southwest district is practically the sole domain of the Santa Fe Railroad. The Santa Fe has tried to compete with new single-car export rates from country points while keeping its gathering rates relatively high where it has no intramodal competition to force it to match lower gathering rates of another railroad. As firms react to this, more trucking from the Southwest may force the Santa Fe to get its gathering rates more in-line with those of other railroads.

Multiple-Car Rates from Country Elevators

Table 11 shows that country elevators have benefited from the use of unit trains from inland terminals to the Gulf. It is now necessary to determine if country elevators would benefit from the use of multiple-car

shipments from country points direct to the Gulf. Table 12 shows the savings in rail rates which would be associated with a subterminal system. The country points and their old export rates are identical to those in Table 11. The best new single-car rate represents the lowest rate found in Table 11 for each point. The multiple-car rate is based upon the best published unit-train rate available to each shipper. This rate was subtracted from the best single-car rate to arrive at a difference or savings which could be realized through the use of unit-trains from country points, i.e., a subterminal system. This difference was divided by the new single-car rate to arrive at a percentage change. All numbers were then averaged by district to give an indication of which sections of the state have potential gain from the use of a subterminal system.

Assuming that railroads will be prepared to contract for rates which have the same geographic relationship as existing unit-train rates, the southern part of Kansas has the greatest potential gain from a subterminal system utilizing contract rates. This is to be expected, since this area is located closer to the Gulf market than are inland terminals. Direct rail shipments from southern Kansas to the Gulf would be more efficient than circuitous shipments through inland terminals which are not located between the origin and the Gulf. The reduction in rail costs associated with this efficiency could then be reflected in lower rail charges for direct Gulf shipments. The Southwest district may be especially interested in unit-train service due to their relative disadvantage in using single-car mileage rates (see Table 11).

It is imperative to note that the savings associated with a subterminal system may, unlike the savings asociated with unit-train rates from inland terminals, be linked to reorganization costs which will more than

Table 12. Potential Transportation Cost Savings Using Multiple-Car Rates from Country Origins

Origin	Railroad[1]	Rates			Rate Difference[3]	
		Old Export[2]	Best new 1-car rate	Multiple-car rate (25-30)	Amount	Percent
		(cents per hundredweight)				
Northwest:						
Colby	BN,UP	188	170	-	-	-
Hill City	UP	172	157	172*	+15	+9.55
Hoxie	UP	187	164	172*	+ 8	+4.88
Norcatur	BN	176	167	166*	- 1	- .60
Norton	BN	175	167	166*	- 1	- .60
District Average		179.6	165	169	5.25	+3.35
North Central:						
Beloit	MP,UP	158	138	130	- 8	-5.80
Concordia	AT,BN,MP	154	130	130	0	0
Kirwin	MP	171	151	143	- 8	-5.30
Minneapolis	AT	154	132	130	- 2	-1.52
Plainville	UP	159	150	-	-	-
District Average		159.2	140.2	133.25	-4.5	-3.16
Northwest:						
Frankfort	MP,UP	148	119	123	- 4	-3.36
Marysville	UP	158	122	-	-	-
Sabetha	UP	158	131	-	-	-
Valley Falls	AT	145	112	101	-11	-9.82
Willis	MP	148	116	122	+ 6	+5.17
District Average		151.2	120	115.33	-.33	- .43

Table 12. (continued)

Origin	Railroad[1]	Rates			Rate Difference[3]	
		Old Export[2]	Best new 1-car rate	Multiple-car rate (25-30)	Amount	Percent
		(cents per hundredweight)				
West Central:						
Leoti	MP	172	158	146	-12	-7.59
Ness City	AT	158	152	137	-15	-9.87
Scott City	AT,MP	171	154	142	-12	-7.79
Sharon Springs	UP	192	178	172*	- 6	-3.37
Wakeeny	UP	175	157	172*	+15	+9.55
District Average		173.6	159.8	153.8	- 6	-3.81
Central:						
Great Bend	AT	154	145	130	-15	-10.34
Hoisington	MP	154	133	131	- 2	-1.49
Kanopolis	MP,UP	146	136	128	- 8	-5.88
Marquette	MP	145	132	126	- 6	-4.55
Russell	UP	159	145	-	-	-
District Average		151.6	138.2	128.75	-7.75	-5.56
East Central:						
Centerville	MKT	143	115	101	-14	-12.17
Council Grove	MP	145	123	120	- 3	-2.44
Osage City	AT,MP	145	120	120	0	0
Paola		145	113	101	-12	-10.62
Strong City	AT	145	125	110	-15	-12.00
District Average		144.6	119.2	110.4	-8.8	-7.45

Table 12. (continued)

Origin	Railroad[1]	Rates			Rate Difference[3]	
		Old Export[2]	Best new 1-car rate	Multiple-car rate (25-30)	Amount	Percent
		(cents per hundredweight)				
Southwest:						
Bucklin	StLSW	154	154	127	-27	-17.53
Dodge City	AT	158	152	133	-19	-12.50
Meade	StLSW	148	148	137	-11	- 7.43
Satana	AT	148	150	138	-12	- 8.00
Syracuse	AT	172	160	148	-12	- 7.50
District Average		156	152.8	136.6	-16.2	-10.59
South Central:						
Anthony	AT,MP	123	124	102	-21	-17.07
Coldwater	AT	145	138	121	-17	-12.32
Haven	MP	145	123	118	- 5	- 4.07
Pratt	AT,StLSW	154	140	125	-15	-10.71
Stafford	AT,MP	154	129	126	- 3	- 2.33
District Average		144.2	130.8	118.4	-12.2	- 9.30
Southeast:						
El Dorado	AT,MP	133	123	108	-15	-12.20
Humbolt	AT	143	122	101	-21	-17.21
Parsons	MKT	129	121	101	-20	-16.53
Pittsbury	AT,MP	133	120	95	-25	-20.83
Yates Center	MP	133	122	108	-14	-11.48
District Average		134.2	121.6	102.6	-19	-15.65

*Rate to Pacific Northwest

[1]Abbreviations as follows: AT = Atchison, Topeka and Santa Fe; BN = Burlington Northern; MKT = Missouri, Kansas, Texas; MP = Missouri Pacific; StLSW = St. Louis and Southwestern; UP = Union Pacific.

[2]Old export is the single-car rate on December 31, 1980 (Ex Parte 386).

[3]Difference between best new single-car rate from Table 11 and 25-30 multiple-car rate.

offset benefits. It is up to an individual elevator operator to calculate his costs before deciding to upgrade to a subterminal status. Undoubtedly, some country elevators can already handle a sufficient volume of grain expediently enough to use unit-train rates. These operators must then decide whether the additional risks associated with contract rates will be offset by the advantages.

IX. EFFECTS OF CHANGES IN TRANSPORT CHARGES ON WHEAT PRICE DIFFERENTIALS

To test the hypothesis that wheat price differentials among markets and mode of transportation for Kansas wheat have changed to reflect changes in transport charges, three price differentials or spreads were examined. The first spread was the spread between the Gulf price for wheat and the price for wheat delivered to Kansas City by rail (Gulf-rail spread). The second price differential examined was the difference between the Gulf price and the price in Kansas City for wheat delivered by truck (Gulf-truck spread). The third spread was the difference between the price of wheat delivered by rail to Kansas City and the price of wheat delivered by truck (truck discount).

Kansas City is used as a representative of the inland terminal cities for three reasons. First, Kansas City draws wheat from a much broader origin area of Kansas than do other terminals.[35] Second, multiple-car rates have been in effect from Kansas City longer than in other terminal areas. Finally, price quotations for wheat are more readily available in greater detail for Kansas City than for other terminal locations.

Definitions of Price Differentials

To define these three price differentials, four sets of wheat market prices quoted in the "Kansas City Grain Market Review" were examined. The first of these sets is prices quoted for contracts for future delivery (futures price) of wheat at Kansas City . The second is the set of market prices for wheat for current delivery to Gulf of Mexico ports (Gulf price). The third is the set of prices for current delivery to Kansas City by rail

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[35]Davis, p. 49.

(rail price), and the fourth is the set of prices for wheat for current delivery by truck to Kansas City (truck price).

The futures price is quoted as an opening and closing price for each day in addition to the high and low for the day for a designated quantity and quality of grain specified in a uniform contract (5000 bushels of No. 2 Hard Red Winter Wheat). The reported high Gulf price is quoted as a "basis". A basis is not an actual price, but an addition or subtraction from a base price. In the case of hard red winter wheat, this base is the Kansas City wheat futures market price for the nearest delivery month. This basis can be added to the designated futures contract price to obtain an actual price for the same day. For example, if the Kansas City futures price for No. 2 hard red winter wheat of ordinary protein content were $4.00 per bushel and the Gulf basis were +50 cents per bushel, the Gulf price would be $4.50 per bushel for wheat with the same characteristics. The price for wheat which arrived in Kansas City by truck is quoted as a range of prices (high and low) which were bid for wheat of various qualities at the time the futures market closed each day (1:15 p.m.).

Market prices for wheat delivered to Kansas City by rail are quoted in much greater detail than for trucked grain. First, prices are quoted as a nominal range of prices paid for each grade (No. 1, No. 2, etc.) of wheat. Nominal prices are not prices which were actually paid during a day, but represent an estimate of what would have been paid for each class of wheat if it had been sold. Second, prices for cash wheat which arrives by rail are quoted as a range of nominal bases for wheat of several different protein contents. These nominal bases can be used to remove any difference in price which resulted from differences in protein content and from movements of the futures prices during the day.

A. Gulf-Rail Spread

Definition of the spreads required selection of the appropriate data from among the several parameters available. Since the Gulf price was quoted as a basis for the highest bid for wheat of ordinary protein content, it was necessary to use the rail and truck prices which most closely corresponded with the Gulf price to determine the Gulf-rail and Gulf-truck spreads.

The Gulf-rail spread was defined as the (highest) Gulf basis quoted minus the highest basis for ordinary protein wheat delivered to Kansas City by rail on the same day. Ordinary protein wheat was used for the Kansas City-Gulf comparison because this is the type exported most often. Domestic millers will usually pay a higher premium than foreign millers for wheat that has a protein content above ordinary. As a result, the export market receives a disproportionate amount of ordinary protein wheat. The high end of the basis range of prices for wheat of this type delivered to Kansas City by rail was used to calculate this spread. The range of prices quoted for a given protein content is usually the result of two factors. The first is different grades and the second is billing (paid-in freight) on a car of wheat. Since the Gulf price is quoted as the best price bid for ordinary protein wheat which arrives at the Gulf by rail, it is reasonable to assume it is the highest grade (No. 1). The transit rate structure for shipments to the Gulf prior to deregulation made billing on these shipments worth more than for other movements, so it is once again reasonable to use the highest price for wheat of ordinary protein content delivered by rail to Kansas City to compare with the Gulf price.

B. Gulf-Truck Spread

Truck prices were quoted as a closing range, so the futures price at the daily close was subtracted from the highest closing truck price to arrive at a truck basis. This truck basis was subtracted from the Gulf basis to arrive at a daily Gulf-truck spread. Since the truck-barge method of transporting wheat to the Gulf of Mexico represents one of the best markets for wheat arriving in Kansas City by truck, the highest truck price was used to compute the Gulf-truck spread. Since the truck price is not quoted as a nominal price, it represents actual prices bid during the day. These prices could be for various grades, quantities, and protein contents. The highest price would normally be bid for No. 1 grade, truckload or greater quantities, and for high protein content. Both grade and quantity correspond to the Gulf bid. These factors, in addition to possibility of later barge shipment to the Gulf, point to a definition of the Gulf-truck spread as the Gulf basis minus the highest truck basis arrived at earlier.

For example, assume the closing futures price is $4.00 per bushel and the Gulf basis is +50 cents per bushel. Assume the range of truck prices at the time the futures market closed on the same day is $3.60 per bushel to $3.80 per bushel. The high truck basis would be -20 cents per bushel. Subracting the high truck basis from the Gulf basis would result in a Gulf-truck spread of 70 cents per bushel.

C. Truck Discount

For the truck-rail spread or truck discount, it was necessary to deviate from the obvious course of subtracting the truck basis used for the Gulf-truck spread from the highest rail basis for ordinary protein wheat

used for the Gulf-rail spread. Although these two classifications of wheat by transport mode competed indirectly for the Gulf market prior to deregulation, the competition between trucked wheat and wheat shipped by rail which carried little or no billing was more direct after deregulation. The current transportation atmosphere emphasizes this point. The present situation dictates that wheat carrying substantial billing be shipped to eastern domestic mills where transit billing still applies, rather than to the Gulf, since unit-train and contract rates now in effect from inland terminals to the Gulf do not require the grain to have arrived by rail. Now, the lower bids on the basis of billing for wheat which arrived by rail will be made for wheat which moves to the Gulf. These lower bids will be made for wheat which moved into inland terminals under the new mileage-based gathering rates cited earlier. Thus, the truck discount is defined as the lowest price for wheat of ordinary protein content which arrived by rail minus the high truck price for wheat used in the Gulf-truck spread.

The truck discount is of such importance in the current transportation atmosphere that it must be defined in this manner. Trucked wheat now competes directly with wheat which was shipped by rail on new mileage-based gathering rates to fill unit trains bound for the Gulf export market. These rates do not carry a transit privilege and will not reduce the price charged for transporting the wheat to the Gulf from an inland terminal. Thus, the truck discount to be concerned with is not the difference between the high truck bid and the highest bid for wheat of ordinary protein content, but the difference between the highest truck bid and the lowest bid for ordinary protein wheat which arrived in Kansas City by rail.

After these price differentials were defined, the appropriate prices quoted in the "Grain Market Review" each Wednesday from 1975 through July,

1981 were manipulated to obtain weekly spreads. Wednesday's prices were selected to minimize the uncertainties which can be reflected in prices quoted on Monday or Friday and to reduce the job of data collection. Weekly spreads were averaged for monthly spreads to facilitate presentation. A smaller sample of monthly spreads obtained from daily spreads did not differ substantially from the monthly spreads obtained from weekly prices. The monthly averages before and after changes in transport charges resulting from the Staggers Act were examined by setting a dummy variable equal to zero from 1975 through November, 1980 and equal to one from December, 1980 to July, 1981. The autoregression procedure from the Statistical Analysis System (SAS) was used to remove the time trend and the significant autoregressive parameters for each spread and test whether the dummy variable was significant for each spread. A T-value of one was used as the critical value for the autoregressive parameters. A printout of the data used for the analyses is presented in Appendix Table 1.

The above-defined Gulf-rail spread, Gulf-truck spread, and truck discount are shown in Figures 2-4 as monthly spreads from 1975 through July, 1981. Trend lines, which incorporate a dummy variable to test the hypothesis that the spreads have changed to reflect changes in transport charges which have been instituted as reactions of railroads to the Staggers Act, are included in the figures.

Analysis of Price Spreads

The savings in transport charges (Table 12) for shipping wheat from Kansas origins to the Gulf of Mexico using unit trains from inland terminals must be reflected in the prices received by country elevators to provide an incentive for greater wheat movement to unit-train

FIGURE 2
SPREAD BETWEEN GULF WHEAT PRICE AND KANSAS CITY RAIL BID
BY MONTH FROM 1975 TO 1981

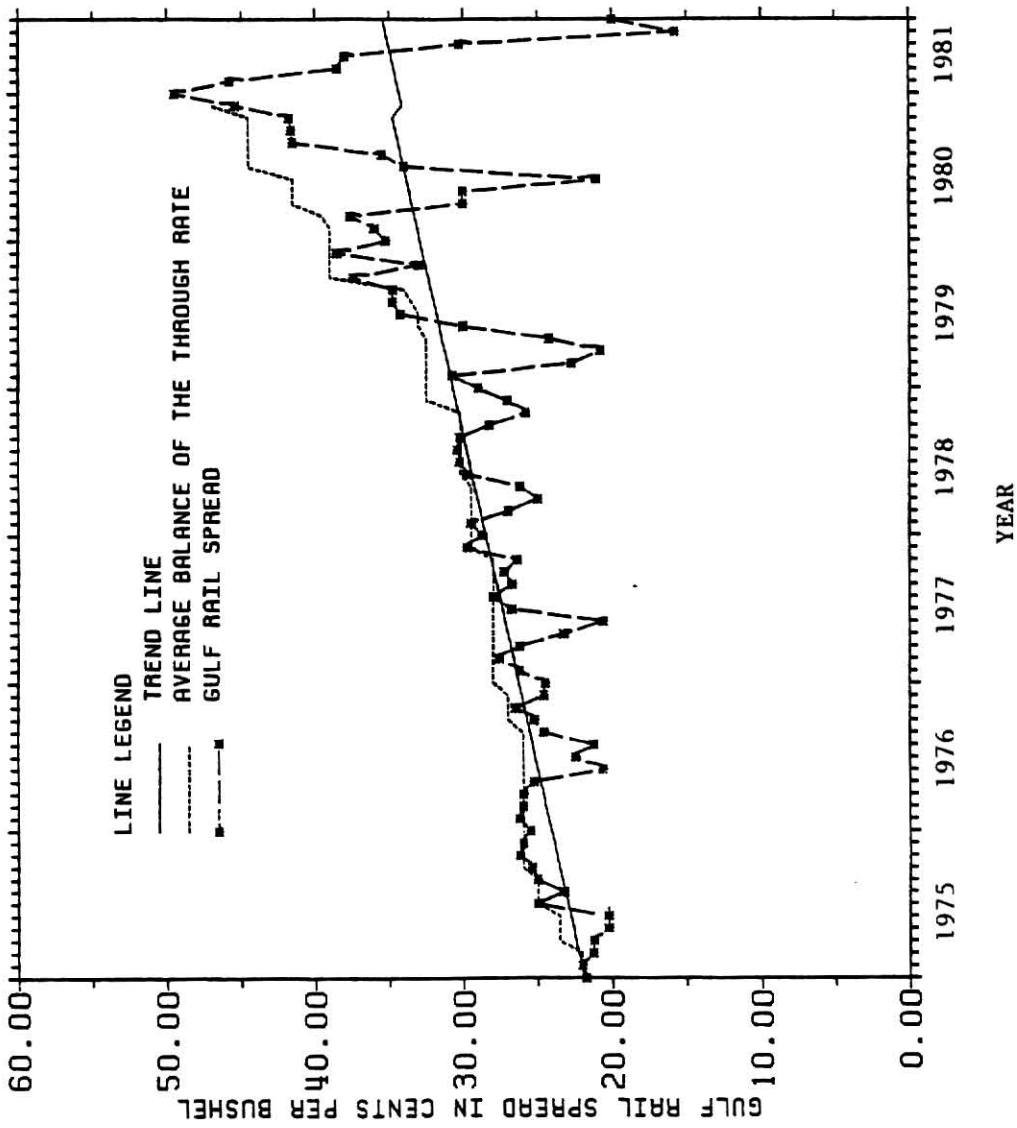


FIGURE 3
SPREAD BETWEEN GULF WHEAT PRICE AND KANSAS CITY TRUCK BID BY MONTH FROM 1975 TO 1981

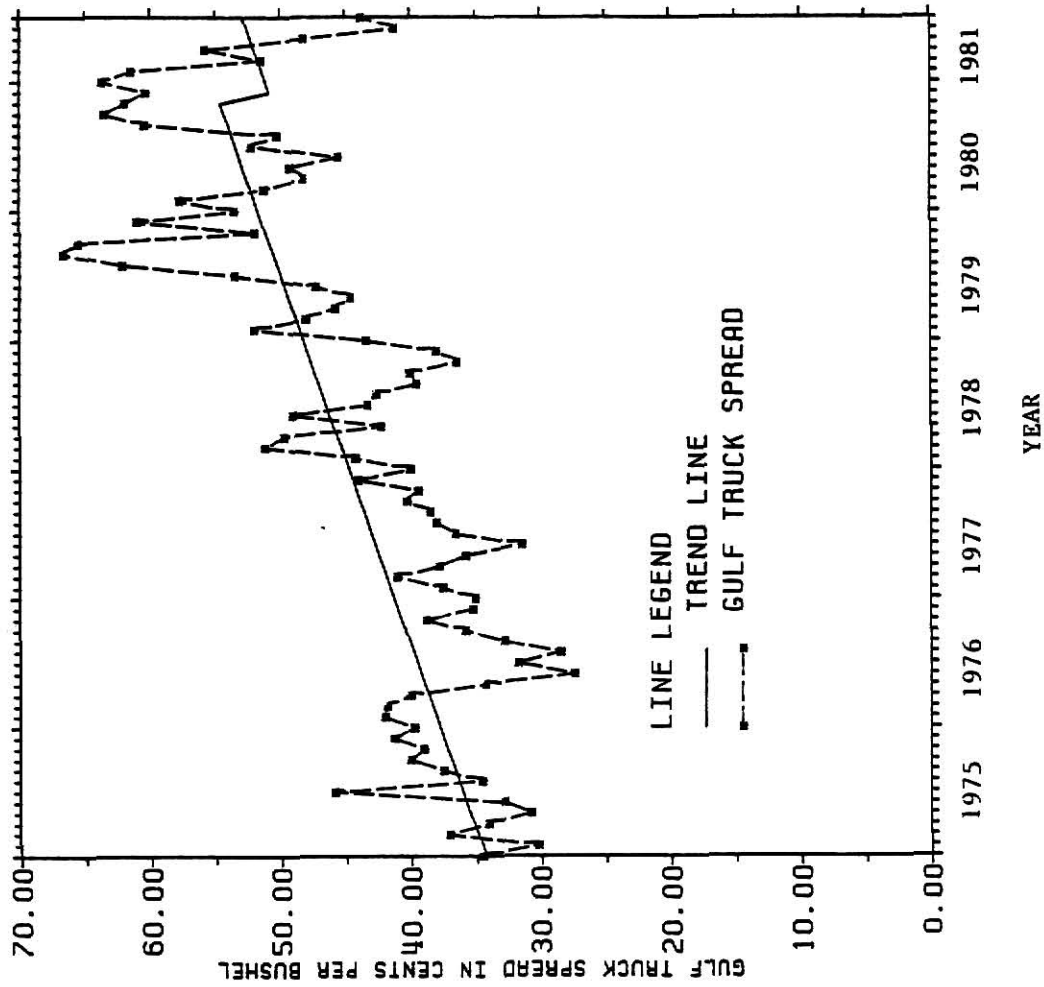
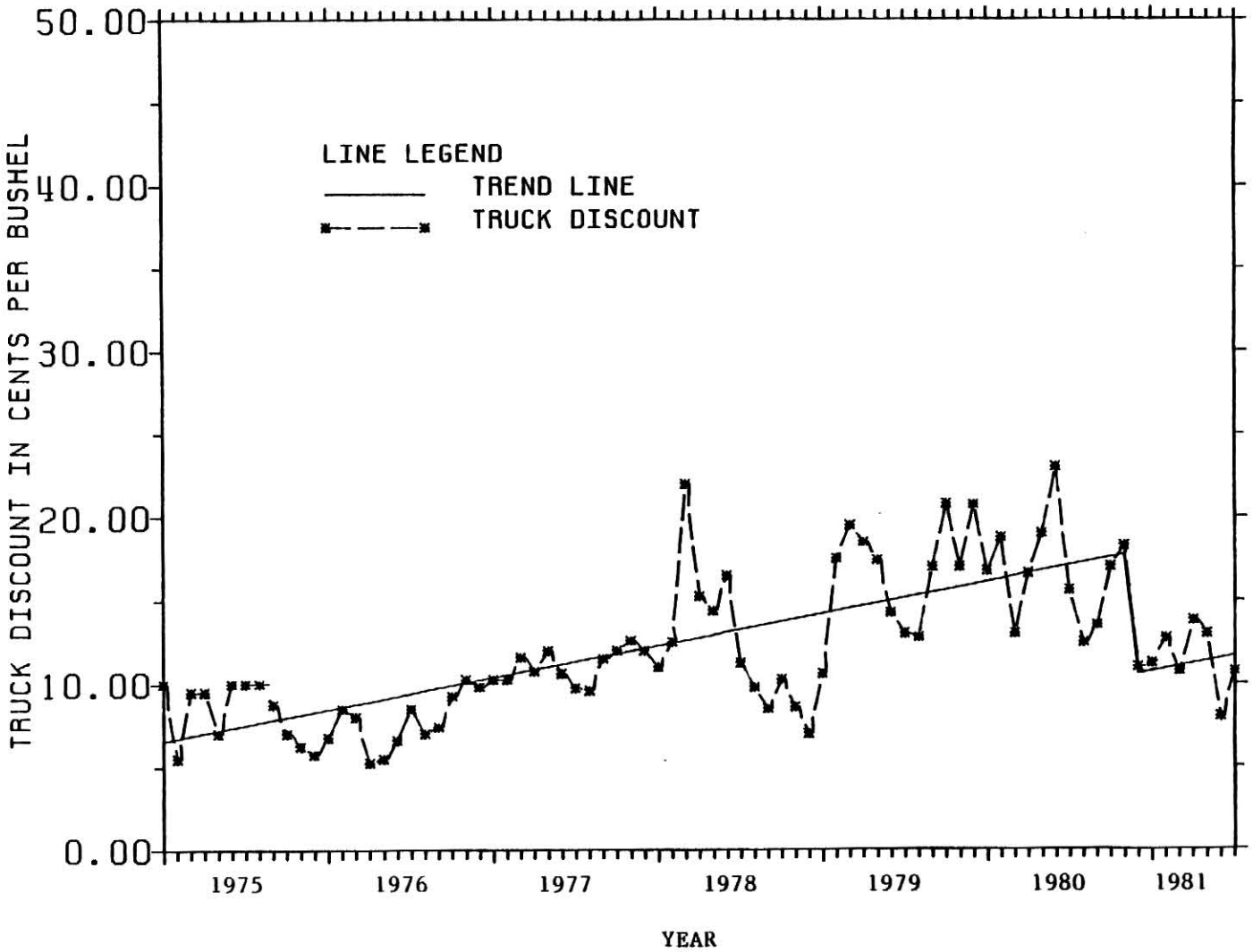


FIGURE 4
KANSAS CITY TRUCK DISCOUNT
BY MONTH FROM 1975 TO 1981



transshipment points. This is the primary reason to examine the price differentials defined earlier. If these transport savings are not being returned to country elevators, there will be an additional incentive to that shown in Table 12 to initiate unit-train shipments from country elevators.

A. Gulf-Rail Spread

The Gulf-rail spread defined in this paper historically (until 1981) represented the charge for transporting wheat from Kansas City to the Gulf of Mexico by rail. Under the transit rate system, this charge was an average balance of the through rate from Kansas origins.

Figure 2 shows the monthly average of the Gulf price minus the highest price for wheat of ordinary protein content which arrived at Kansas City by rail. The dotted line represents the average balance of the through rate to the Gulf (from Table 4). This figure shows that the primary difference between the price of wheat at Kansas City and at the Gulf is transportation costs. Figure 2 illustrates another point as well. The price of wheat in Kansas City does not always correspond perfectly with the Gulf price less transportation charges. Many times during the year, other markets, primarily mills, will bid more for wheat in Kansas City than will Gulf exporters. This is especially evident in the months just prior to harvest. An explanation of this is that flour millers have a more consistent demand for wheat throughout the year and thus prior to harvest may need to bid more for the limited supply of wheat to satisfy their demand. Exporters, on the other hand, may be willing to delay shipments until after the new crop arrives.

After contract rates became available for trainload shipments of wheat from Kansas City to the Gulf, the Gulf-rail spread as defined no longer represents the transport charge between Kansas City and the Gulf. Now, the highest bids for wheat of ordinary protein content on the basis of billing will not be made for wheat which will move to the Gulf. The highest bids in Kansas City will be made for wheat which was inbound on an old transit rate from which the billing will apply to a later proportional or transit balance rate to Southeastern flour mills. Billing will not reduce a multiple-car rate to the Gulf. Thus, after deregulation, the spread as defined earlier does not represent the charge for transporting wheat from Kansas City to the Gulf, but an examination of this spread will provide a check for examination of other price spreads.

The rail transport charge from Kansas City to the Gulf has not changed due to the Staggers Act. The last average balance of the through rate (Ex Parte 386) approximately equals the best volume rate of 78 cents per hundredweight. Since the higher rail bids for wheat of ordinary protein content in Kansas City now represent bids for wheat moving on pre-deregulation rail rates, and the transport charge from Kansas City to the Gulf has not changed, the Gulf-rail spread as defined should not change either. Assuming Gulf bids less transportation charges, set terminal elevator prices and set a floor on mill prices, a higher Gulf-rail spread would indicate a partial retention of reduced gathering rates by terminal merchants in the form of a lower bid for wheat delivered to Kansas City. A higher Gulf-rail spread would provide an additional incentive (to that in Table 12) to country elevator operators for multiple-car shipments direct to the Gulf. A lower Gulf-rail spread would provide less incentive.

An examination of the spread between the rail price for wheat at the Gulf and Kansas City as defined earlier is presented in Appendix Table 2. Using the SAS autoregressive procedure, the Gulf-rail spread before and after the Staggers Act was examined using a dummy variable. After the time trend and the significant autoregressive parameters were removed, this dummy variable was not significant. This result conforms to expectations since the real savings in rail rates came not between Kansas City and the Gulf, but between country points and Kansas City.

Industry representatives have asserted that these savings on gathering rates are being passed back to country elevators. They assert that the Kansas wheat market is too competitive to allow an inland terminal merchant to increase his margin by retaining any transport savings. An examination of country elevator bids relative to terminal bids would shed more light on the subject, but the new gathering rates have not been in effect long enough to make this possible.

B. Gulf-Truck Spread

An alternative is to examine the spread between the Gulf price and the price for wheat arriving in Kansas City by truck. Since wheat moving on multiple-car rates from Kansas City to the Gulf was first gathered by trucks, if the transportation savings in this market was passed back to country elevators, it would be reasonable to assume that the savings on rail gathering rates would not be retained. Unlike the savings in the rail transport market, the transport savings for wheat which was gathered into inland terminals by truck came between the inland terminals and the Gulf. This was a result of the multiple-car rail rates which did not require a previous rail shipment. Thus, these savings should be reflected in the

Gulf-truck spread which represents the cost for moving wheat which originated on trucks from Kansas City to the Gulf. The Gulf-truck spread was examined in the same manner as the Gulf-rail spread.

Unfortunately, this analysis was inconclusive (see Appendix Table 3). The dummy variable is only significant at the .28 level. Even if it was significant, it could be a result of lower barge rates rather than lower rail rates. Barge rates from Kansas City to the Gulf have dropped from 200 percent to 135 percent of tariff (42 cents to 28 cents per bushel) since December. Still, the extent to which lower barge rates are a reaction to general market conditions or a reaction to increased railroad competition is not known.

The level of significance of the dummy variable for the Gulf-truck spread must be weighed against industry claims and against the increase in truck receipts at inland terminals which came as a result of unit-train shipments from inland terminals to the Gulf. The truck bid at Kansas City had to rise relative to the Gulf bid (lower Gulf-truck spread) to provide a price incentive for trucking wheat to inland terminals to fill unit-trains. An examination of the truck discount provides another method for checking reactions of terminal prices to reduced transport charges.

C. Truck Discount

Since the Gulf-rail spread has not changed, and the Gulf-truck spread has dropped, the truck discount should also drop. An increase in the truck price relative to the rail price for wheat at Kansas City would indicate that the savings in transport charges, from Kansas City to the Gulf for wheat that originated on truck, that are being passed on to truckers of wheat are not offset by lower prices for wheat which originated on rail.

In other words, transportation rate savings are being passed on to country elevator operators. Thus, the savings in transport charges associated with a subterminal system must be compared to current transport charges (as in Table 12) and not to previous transport charges.

The transit rate structure employed by railroads resulted in a truck discount in Kansas City (see Figure 4). The truck discount represented the additional cost of transporting wheat which arrived in Kansas City by truck relative to that which arrived by rail, to its final destination. When multiple-car rates from Kansas City to the Gulf became effective, the primary reason for a truck discount in the Gulf portion of the Kansas City wheat movement was eliminated. Trucked grain is no longer at a rail rate disadvantage relative to that which arrived by rail if it is moving on to the Gulf. If these savings are being returned to shippers that truck wheat to Kansas City, this should be reflected in the truck discount. But the truck discount should not be completely eliminated. Rail transit privilege remains for wheat shipments to Southeastern flour mills and is the railroads attempt to compete with barges for this market in the absence of an opportunity to compete directly as in the Gulf transportation market.

The truck discount at Kansas City was examined in the same manner as the Gulf-rail spread. The truck discount is now substantially lower than it was before the Staggers Act. The dummy variable is significant at the .0001 level of significance (see Appendix Table 4). This tends to confirm that transportation savings are being passed back to country elevators.

The Gulf-rail spread analysis indicates that inland terminal merchants have not increased margins to offset the savings in rail transport charges from country elevators to inland terminals. The drop in the Gulf-truck spread represents the savings in rail rates to the Gulf

which were passed on to shippers of wheat which used the truck mode for transportation of wheat to inland terminals. The truck discount analysis confirms both these points.

Thus, it is reasonable to assume that the reductions in single-car rail rates on shipments of wheat from Kansas origins to the Gulf of Mexico are being passed on to country elevators. Furthermore, any reduction in rail rates available from the use of multiple-car shipments from country elevators directly to the Gulf must be recognized as only the reduction below current single-car rates and not as a reduction of pre-deregulation rates.

The truck discount analysis also shows that inland terminals at Kansas City are bidding relatively more for trucked wheat than they were prior to multiple-car rates to the Gulf. This higher truck bid will provide an additional incentive for truckers of wheat to ship to inland terminals. Thus, it will be more difficult for a country elevator to top the best net inland terminal bid for the trucked grain available for handling an additional volume of wheat profitably.

X. RESULTS AND CONCLUSIONS

The Staggers Act gives shippers the opportunity to contract with railroads for low-cost volume rail rates. In reference to the Kansas wheat market, extreme caution is recommended. There are six reasons for this recommendation. The first two reasons apply only to contract rates and the remaining four apply to both contract rates and unit-train tariff rates from country points. First, rail rates are changing so rapidly that a contract rate which appears advantageous when agreed to, may be actually higher than a newer single-car rate. Second, the levels and variations of intermarket spreads show the difficulties for country elevators attempting to sell to a single market for the highest net price. A reduced rail contract rate which involves a tie-in to the Gulf market will substantially reduce market options. Even if the average level of the net bid at the Gulf was greater than the average net price at inland terminals, variations in this spread may cause a country elevator contractor to sell at the Gulf market for a lower net price than is available at an inland terminal.

Third, most terminals handle a larger volume of wheat than do potential subterminals, so rates based on volume will initially favor inland terminals. The greater degree of intermodal and intramodal competition at the terminals provides a further reason for lower export rates at inland terminals than at country elevators. The new gathering rates based on distance now make terminal volume rates directly competitive with country volume rates. For example, assume a country elevator with a transport charge of 50 cents per hundredweight to the nearest inland terminal has a unit-train rate of $1.50 per hundredweight to the

Gulf. If the terminal's best rate to the Gulf drops below $1.00 per hundredweight, there is no incentive in transport charges for using a unit-train directly from the country elevator to the Gulf.

Unit trains from subterminals have worked well in the Corn Belt, but the Kansas wheat market is substantially different.[36] Kansas has a better rail system to country points than Iowa, hence, Kansas shippers are less likely to rely on truck movements, which reduces a subterminal's cost opportunity for benefits through reduced marketing costs. Research in the Southern Plains has shown that the volume of wheat required for a subterminal must be drawn from areas with no rail service, for example, off the farm or from a country elevator with no rail service.[37] Few areas meet that criterion in Kansas. In contrast, a system utilizing unit trains from terminals (the current system) will draw from both areas with rail service and those without. Consequently, a shipper contemplating upgrading his elevator to a subterminal status is primarily concerned with the truck bid at inland terminals. He must be able to top this bid at his elevator less his margin and the respective transportation costs in order to draw the extra volume needed for a lower rail rate. Assuming a constant difference between the rail bid of a potential subterminal and that of the primary inland terminal competitor, it follows that if the truck bid relative to the rail bid rises at the inland terminal, it will be more difficult to pull this trucked grain from the terminal. The truck discount is now substantially lower than it was before the Staggers Act. Thus, it will now be much harder for potential subterminals to compete with

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[36]see Sorenson and Fuller, p. 8.

[37]Sorenson and Fuller, pp. 32-36.

inland terminals for trucked grain than it was before deregulation. Now inland terminals are just as willing to buy grain which arrives by truck, to fill their volume shipments to the Gulf, as they are to buy grain which arrives by rail.

Fifth, existing studies indicate that a subterminal system will require new investment in elevator facilities and railroad siding at subterminal points to accommodate unit trains. Subterminals must also accumulate larger inventories of grain for trainload shipments than commonly occur at country elevators. Additional investment in physical capital and working capital each increase costs and result in new patterns of risk of operating losses.

Finally, the study of Sorenson and Fuller showed that the largest savings relative to the old single-car system came from a system of unit trains operating out of inland terminals. This system saved approximately 6.7 cents per bushel while the 50-80 car system saved 8.7 cents and the 20-50-80 car system saved 9.6 cents.[38] The current system is comparable to the 80 car alternative, so it must be used as a starting point. While 9.6 cents per bushel may justify the risks noted above, 2.9 cents may not.

This does not mean that a subterminal system will never be feasible in Kansas. If rail rates reverse their trend since deregulation and begin rising relative to competitive modes, a point may be reached to make an alternative system practical. Conversely, if the newly found competition among railroads causes many rail lines in the state to become unprofitable and subsequently results in their abandonment, the atmosphere for a subterminal system may become extremely favorable.

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[38]Ibid., p. 1-2.

Both of these senarios are possible. Based on current events, however, the probability of extensive contract rates from Kansas country elevators to Gulf of Mexico ports is not high.

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APPENDIX TABLE 1
KANSAS CITY TRUCK DISCOUNT AND SPREADS BETWEEN GULF WHEAT PRICE AND KANSAS CITY RAIL OR TRUCK BID

NO	MONTH	YEAR	GRSPR	GTSPR	TDIS	BAL	DUMY
1	1	75	21.75	34.50	10.00	22.0	0
2	2	75	22.00	30.25	5.50	22.0	0
3	3	75	21.25	37.00	9.50	22.0	0
4	4	75	21.20	34.00	9.50	23.5	0
5	5	75	20.25	30.75	7.00	23.5	0
6	6	75	20.25	32.75	10.00	23.5	0
7	7	75	25.00	45.80	10.00	25.0	0
8	8	75	23.25	34.50	10.00	25.0	0
9	9	75	25.00	37.50	8.75	25.0	0
10	10	75	25.40	40.00	7.00	26.0	0
11	11	75	26.25	39.00	6.25	26.0	0
12	12	75	26.00	41.25	5.75	26.0	0
13	1	76	25.50	39.75	6.75	26.0	0
14	2	76	26.25	42.00	8.50	26.0	0
15	3	76	26.00	41.80	8.00	26.0	0
16	4	76	26.00	40.00	5.25	26.0	0
17	5	76	25.25	34.25	5.50	26.0	0
18	6	76	20.60	27.40	6.60	26.0	0
19	7	76	22.50	31.75	8.50	26.0	0
20	8	76	21.25	28.50	7.00	26.0	0
21	9	76	24.60	32.80	7.40	26.0	0
22	10	76	25.25	35.75	9.25	27.0	0
23	11	76	26.50	38.75	10.25	27.0	0
24	12	76	24.60	35.20	9.80	27.0	0
25	1	77	24.50	35.00	10.25	28.0	0
26	2	77	26.25	37.50	10.25	28.0	0
27	3	77	27.60	41.00	11.60	28.0	0
28	4	77	26.25	37.75	10.75	28.0	0
29	5	77	23.25	35.75	12.00	28.0	0
30	6	77	20.60	31.40	10.60	28.0	0
31	7	77	26.75	36.50	9.75	28.0	0
32	8	77	28.00	38.00	9.60	28.0	0
33	9	77	26.75	38.50	11.50	28.0	0
34	10	77	27.25	40.25	12.00	28.0	0
35	11	77	26.40	39.40	12.60	28.0	0
36	12	77	29.75	44.00	12.00	29.5	0
37	1	78	28.75	40.00	11.00	29.5	0
38	2	78	29.50	44.25	12.50	29.5	0
39	3	78	27.00	51.20	22.00	29.5	0
40	4	78	25.00	49.75	15.25	29.5	0
41	5	78	26.20	42.20	14.40	29.5	0
42	6	78	29.75	49.00	16.50	30.2	0
43	7	78	30.25	43.25	11.25	30.2	0
44	8	78	30.40	42.60	9.80	30.2	0
45	9	78	30.25	39.50	8.50	30.2	0
46	10	78	28.25	40.00	10.25	30.2	0
47	11	78	25.80	36.40	8.60	30.2	0

APPENDIX TABLE 1
KANSAS CITY TRUCK DISCOUNT AND SPREADS BETWEEN GULF WHEAT PRICE AND KANSAS CITY RAIL OR TRUCK BID

NO	MONTH	YEAR	GRSPR	GTSPR	TDIS	BAL	DUMY
48	12	78	27.00	38.00	7.00	32.5	0
49	1	79	29.00	43.40	10.60	32.5	0
50	2	79	30.75	52.00	17.50	32.5	0
51	3	79	22.75	48.00	19.50	32.5	0
52	4	79	20.75	45.75	18.50	32.5	0
53	5	79	24.20	44.60	17.40	32.5	0
54	6	79	30.00	47.25	14.25	33.0	0
55	7	79	34.25	53.50	13.00	33.0	0
56	8	79	34.80	62.20	12.80	33.5	0
57	9	79	34.75	66.75	17.00	34.0	0
58	10	79	37.40	65.60	20.80	39.0	0
59	11	79	33.00	52.00	17.00	35.0	0
60	12	79	38.50	61.00	20.75	39.0	0
61	1	80	35.25	53.50	16.75	39.0	0
62	2	80	36.00	57.75	18.75	39.0	0
63	3	80	37.60	51.20	13.00	39.5	0
64	4	80	30.00	48.20	16.60	41.5	0
65	5	80	30.00	49.25	19.00	41.5	0
66	6	80	21.00	45.50	23.00	41.5	0
67	7	80	34.00	52.20	15.60	44.5	0
68	8	80	35.50	50.25	12.50	44.5	0
69	9	80	41.50	60.50	13.50	44.5	0
70	10	80	41.60	63.60	17.00	44.5	0
71	11	80	41.75	62.00	18.25	44.5	0
72	12	80	45.40	60.40	11.00	47.0	1
73	1	81	49.50	63.75	11.25	.	1
74	2	81	45.75	61.50	12.75	.	1
75	3	81	38.50	51.50	10.75	.	1
76	4	81	38.00	55.80	13.80	.	1
77	5	81	30.25	48.25	13.00	.	1
78	6	81	15.75	41.25	8.00	.	1
79	7	81	20.00	43.75	10.75	.	1

APPENDIX TABLE 2
TEST FOR SIGNIFICANCE OF UNIT TRAIN RATES ON THE SPREAD BETWEEN
GULF WHEAT PRICE AND KANSAS CITY RAIL BID

DEPENDENT VARIABLE = GRSPR GULF RAIL SPREAD

ORDINARY LEAST SQUARES ESTIMATES

VARIABLE	DF	B VALUE
INTERCPT	1	21.03668
MO	1	0.1894155
DUMY	1	0.05620482

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	25.9608	1.000000	|********************|
1	17.1534	0.660742	|************* |
2	7.58193	0.307461	|****** |
3	0.743435	0.028637	|* |
4	-3.14636	-0.121197	| **| |
5	-6.40094	-0.246562	| *****| |
6	-8.573	-0.330228	| *******| |
7	-8.10877	-0.312346	| ******| |
8	-8.38306	-0.322912	| ******| |
9	-6.14066	-0.236536	| *****| |
10	-2.24388	-0.086433	| **| |
11	2.45538	0.094580	| |** |
12	7.24197	0.278958	| |****** |

PRELIMINARY MSE= 12.95173

ESTIMATES OF THE AUTOREGRESSIVE PARAMETERS

LAG	COEFFICIENT	STD DEVIATION	T RATIO
1	-0.76058327	0.10811830	-7.034732
2	0.17852502	0.10803795	1.652466
12	-0.19159091	0.08145984	-2.351568

SSE	853.5576
DFE	76
MSE	11.76313
ROOT MSE	3.429741
R-SQUARE	0.2291

APPENDIX TABLE 2
TEST FOR SIGNIFICANCE OF UNIT TRAIN RATES ON THE SPREAD BETWEEN GULF WHEAT PRICE AND KANSAS CITY RAIL BID

VARIABLE	DF	B VALUE	STD DEVIATION	T RATIO	APPROX PROB	
INTERCPT	1	21.6823086117	1.16531820237	18.606	0.0001	
MU	1	0.1839024707	0.04192095646	4.387	0.0001	SLOPE
DUMY	1	-0.80656558	2.66775615602	-0.302	0.7632	DUMMY

APPENDIX TABLE 3
TEST FOR SIGNIFICANCE OF UNIT TRAIN RATES ON THE SPREAD BETWEEN
GULF WHEAT PRICE AND KANSAS CITY TRUCK BID

DEPENDENT VARIABLE = GTSPR GULF TRUCK SPREAD

ORDINARY LEAST SQUARES ESTIMATES

VARIABLE	DF	B VALUE
INTERCPT	1	30.80788
MO	1	0.3462796
DUMY	1	-3.67699

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	38.3928	1.000000	|********************|
1	24.7966	0.645867	|************* |
2	16.7575	0.436474	|********* |
3	8.51756	0.221853	|**** |
4	2.85013	0.074236	|* |
5	-3.7651	-0.098068	**| |
6	-6.12467	-0.159526	***| |
7	-7.02175	-0.182892	****| |
8	-10.5622	-0.275108	******| |
9	-10.37	-0.270102	*****| |
10	-6.47395	-0.168624	***| |
11	-1.08855	-0.028353	*| |
12	3.95097	0.102909	| ** |

PRELIMINARY MSE= 21.81285

ESTIMATES OF THE AUTOREGRESSIVE PARAMETERS

LAG	COEFFICIENT	STD DEVIATION	T RATIO
1	-0.64930654	0.0848384C	-7.653451
12	-0.12131901	0.08483949	-1.430001

SSE	1534.954
DFE	76
MSE	20.19677
ROOT MSE	4.494081
R-SQUARE	0.2699

APPENDIX TABLE 3
TEST FOR SIGNIFICANCE OF UNIT TRAIN RATES ON THE SPREAD BETWEEN GULF WHEAT PRICE AND KANSAS CITY TRUCK BID

VARIABLE	DF	B VALUE	STD DEVIATION	T RATIO	APPROX PROB	
INTERCPT	1	33.9548002999	1.5185865291C	22.354	C.0001	
MO	1	0.2908196158	0.05670494995	5.129	0.0001	SLOPE
DUMY	1	-4.0549965	3.7CEE4CC3913	-1.093	C.2777	DUMMY

APPENDIX TABLE 4
TEST FOR SIGNIFICANCE OF UNIT TRAIN RATES ON THE
KANSAS CITY TRUCK DISCOUNT

DEPENDENT VARIABLE = TDIS TRUCK DISCOUNT

ORDINARY LEAST SQUARES ESTIMATES

VARIABLE	DF	B VALUE
INTERCPT	1	6.221559
MD	1	0.1617055
DUMY	1	-7.01783

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	7.82992	1.000000	|**********|
1	3.74725	0.478581	|********** |
2	1.19785	0.152984	|*** |
3	-0.349688	-0.04466C	*| |

PRELIMINARY MSE= 5.925152

ESTIMATES OF THE AUTOREGRESSIVE PARAMETERS

LAG	COEFFICIENT	STD DEVIATION	T RATIO
1	-0.49704655	0.09903760	-5.018766
3	0.12070671	0.09903760	1.218736

SSE	453.75CE
DFE	76
MSE	5.970931
ROOT MSE	2.443545
R-SQUARE	0.4367

VARIABLE	DF	B VALUE	STD DEVIATION	T RATIO	APPROX PROB	
INTERCPT	1	6.401668795842	0.851965CE53E	7.514	C.CCC1	
MD	1	0.1592679247C	0.0208943771B	7.623	C.C001	SLOPE
DUMY	1	-7.2982417	1.59161365324	-4.585	C.CC01	DUMMY

PROSPECTS FOR CONTRACT RAIL RATES FROM KANSAS COUNTRY ELEVATORS

by

BRIAN J. MAYDEW

B.S., Kansas State University, 1975

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The objectives of this study are:

1) To identify and specify regulatory changes which provided options for changes in transportation charges for grain;
2) To identify the major changes that have occurred in transportation rates for wheat from Kansas origins to various markets since major rail deregulation occurred;
3) To examine the changes in mode of transportation and the savings in transport charges for wheat shipped from Kansas country elevators associated with the changes in transportation rates;
4) To test the hypothesis that wheat price differentials among markets and modes of transportation for Kansas wheat have changed to reflect changes in transport charges; and
5) To identify implications for Kansas grain merchants relative to changes in transport options discovered in objectives 1 through 4.

The "Staggers' Rail Act of 1980" provided options for changes in transportation rates for grain. These options now include trainload shipments of wheat moving under unit-train or contract rates from inland terminals and/or subterminals. Other options are trucking wheat or transporting wheat by rail on non-transit gathering rates to a point which utilizes trainload shipments.

The use of mileage-based non-transit gathering rates combined with trainload shipments of wheat from inland terminals has substantially reduced the transport charge for moving wheat from country origins in Kansas to the Gulf of Mexico. An examination of wheat price differentials indicated that these reductions in rail rates were passed on to shippers from country points.

Thus, the potential savings in transport charges associated with trainload shipments of wheat from country elevators in Kansas must be compared to present rates, not to pre-deregulation rates. When examined in this light, the potential savings available through the use of unit-train rates from country points do not appear to justify the cost of upgrading a potential subterminal's faciltities to handle unit trains. The additional risks inherent in contracting for trainload shipments of wheat currently outweigh potential benefits.

Contract rail rates which involve tie-ins to specific markets, such as the Gulf, substantially reduce the marketing options for shippers. When prices at the Gulf decrease relative to inland terminal prices, a shipper may find himself locked into a market which has a lower net price than alternative markets. Futhermore, truck prices for wheat at inland terminals have risen relative to rail prices. Thus, a potential subterminal will find difficulty in bidding trucked wheat away from inland terminals.

Therefore, volume contract rail rates from country elevators in Kansas to the Gulf of Mexico are not favorable in the current wheat transportation atmosphere.