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ABSTRACT

A case study approach is used to document shifts in HRS wheat marketing patterns based on changes in relative freight rates. The scenario details how changes in freight rates can affect movements of grain from two regions to one market destination.

I. Introduction

Recent legislation affecting the transportation industry has been towards increased rate flexibility. Railroads in particular have been granted considerable pricing freedom since passage of the Staggers Rail Act in 1980. The Act also granted railroads the liberty to contract individually with shippers and receivers.

Rate flexibility and the ability to contract has allowed railroads, and shippers and receivers to respond in a more timely fashion to changes in market signals. These factors have permitted country grain shippers (country elevators) in North Dakota to penetrate nontraditional markets and/or increase shipments to previously little-used markets.

The purpose of this paper is to analyze shifts in regional HRS wheat marketing patterns that coincided with the terms of three railroad contracts. Specifics on the contracts are not available because of confidentiality, but factors such as origin (region), term and destination are available. Additionally, country elevator board prices (prices paid to farmers) are

analyzed. The data base used in this paper does not lend itself to analysis by statistical techniques. Rather, it will be demonstrated how HRS wheat prices and shipments changed during the period the rail contracts were in effect.

II. Background

Because confidentiality precludes obtaining detailed information concerning rail contracts, little is known about specific items contained in the contracts that are addressed in this paper. However, the Interstate Commerce Commission (ICC), under authority provided in the Staggers Act, publishes summaries of rail contracts. Three contracts were filed with the ICC by the Burlington Northern railroad (BN) concerning wheat movements from North Dakota to the PNW in February 1985. Duration of the three contracts was roughly February 6 to April 30, 1985. Together the contracts called for a minimum volume of 1,040 carloads or about 3.5 million bushels. Country elevators that participated in the contracts were located in the eastern part of the state.[1]

III. Marketing Patterns

North Dakota has a comprehensive data base concerning grain shipments from country elevators to various market destinations. Country elevator personnel report, on a monthly basis, grain shipments by commodity, month, mode and destination. These movements can be further aggregated by elevator, county, crop reporting district (CRD), railroad and line segment. These data will be used to demonstrate how marketing patterns from certain regions in North Dakota changed during the terms of the contracts.

Country elevators in North Dakota primarily ship to three markets, Duluth/Superior (DS), Minneapolis/St. Paul (MSP) and the Pacific Northwest (PNW) - (Table 1). DS receives the most grain while MSP and the PNW are second and third, respectively.

TABLE 1. NORTH DAKOTA GRAIN AND OILSEED SHIPMENTS BY DESTINATION.

Year	MSP	DS	PNW	MISC	TOTAL
			(000 bu.)		
1975-76	104,900 (33%)	152,514 (48%)	22,031 (7%)	40,840 (13%)	320,285 (100%)
1976-77	109,620 (36%)	128,044 (42%)	20,823 (7%)	47,425 (16%)	305,912 (100%)
1977-78	85,231 (24%)	192,925 (54%)	29,031 (8%)	51,417 (14%)	358,604 (100%)
1978-79	93,353 (20%)	250,653 (55%)	46,413 (10%)	65,814 (14%)	456,233 (100%)
1979-80	119,711 (25%)	230,544 (48%)	46,954 (10%)	78,856 (17%)	476,065 (100%)
1980-81	81,487 (20%)	184,825 (46%)	39,975 (10%)	94,798 (24%)	401,085 (100%)
1981-82	92,099 (20%)	230,899 (50%)	37,006 (8%)	101,859 (22%)	461,862 (100%)
1982-83	122,745 (25%)	201,427 (41%)	45,240 (9%)	122,259 (25%)	491,671 (100%)
1983-84	135,711 (24%)	208,948 (36%)	59,529 (10%)	168,829 (29%)	573,018 (100%)
1981-82 to 1983-84 Av.	116,852 (23%)	213,758 (42%)	47,258 (9%)	224,118 (25%)	508,850 (100%)

Source: Ming, Dennis R. and Randy D. Dick, North Dakota Grain and Oilseed Transportation Statistics, UGPTI Rpt. No. 56, Upper Great Plains Transportation Institute, North Dakota State University, Fargo, North Dakota, November 1984.

The state of North Dakota was divided into three shipping regions (east, central and west) to illustrate changes in shipping patterns during the term of the contracts (Figure 1). Figures 2, 3 and 4 contain HRS wheat movements to the PNW from the three regions for crop years 1982-83, 1983-84 and 1984-85, respectively.[2] Very little HRS wheat was shipped to the PNW from eastern North Dakota during 1982-83, 1983-84 and the first few months of 1984-85. However, over 2 million bushels of HRS was shipped in both March and April, 1985. The volume of HRS shipped to the PNW from eastern North Dakota in both March and April was over 10 times that shipped during any previous month. Thus, shippers located in eastern North Dakota shipped an extraordinary amount of grain to the PNW while the three rail contracts were in effect (February to April).

Shippers located in the eastern part of the state shipped more HRS to the PNW in both March and April of 1985 than shippers located in western North Dakota (Figure 4). Movements during these two months marked the first time in recent history that country elevators from eastern North Dakota shipped more HRS to the PNW than elevators located in the western portion of the state. This shift in HRS movement coincided precisely with the time period the three rail contracts were in effect.

IV. Spatial Price Relationships and Market Boundaries

Price differences between two regions that supply the same market (assuming a homogeneous product, a competitive market structure, perfect knowledge and free trade) will equal transfer costs (transportation and handling) - (Tomek and Robinson). While the grain trade does not meet all the essential criteria to constitute a perfect market, spatial price relationships are often due to transfer costs. As such, country elevators in western North Dakota typically ship HRS wheat to the Pacific Northwest while elevators in the eastern part of the state usually supply the Duluth/Superior and

FIGURE 1

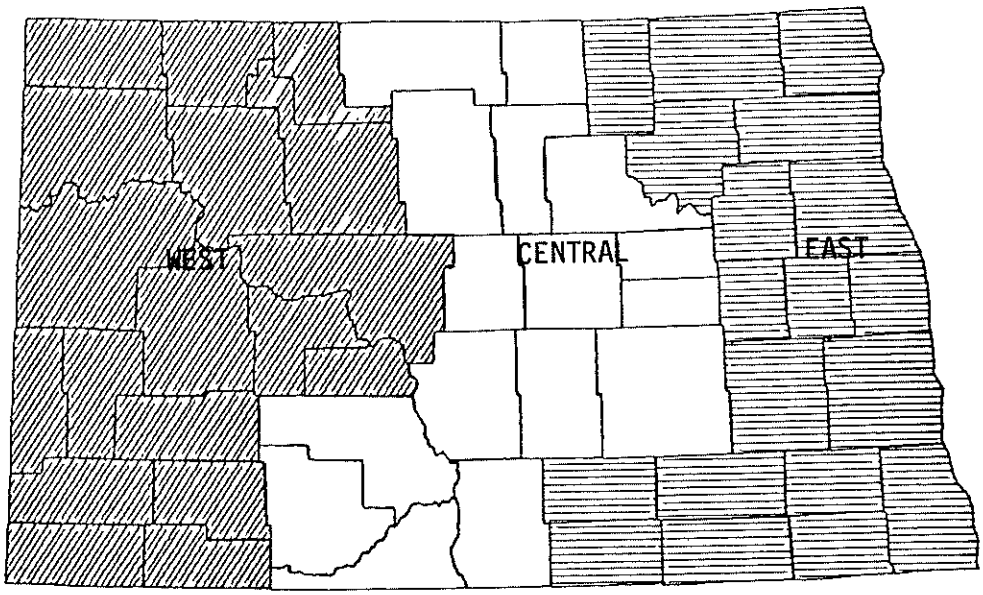


FIGURE 2

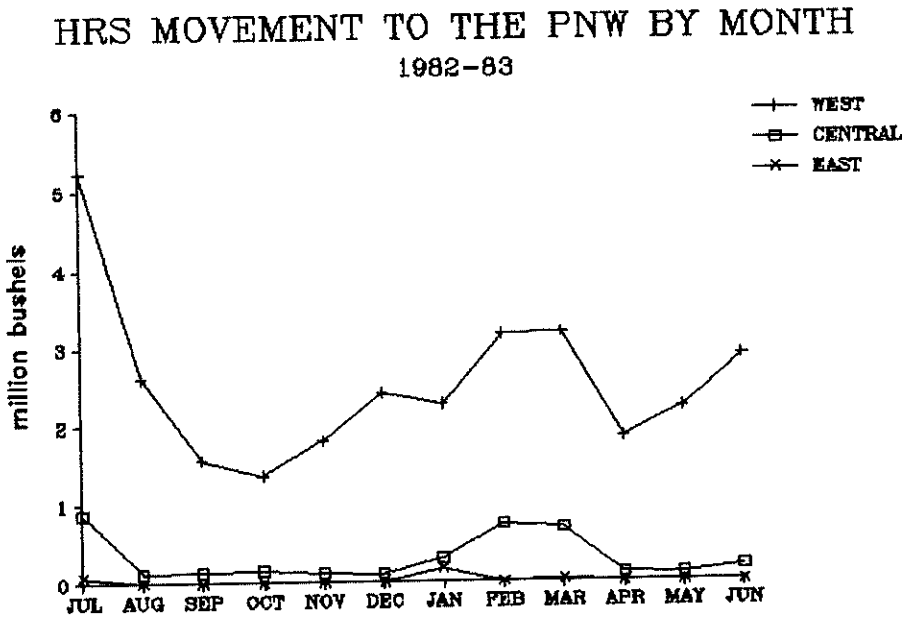

HRS MOVEMENT TO THE PNW BY MONTH
1982-83
WEST
CENTRAL
EAST
million bushels
0
1
2
3
4
5
6
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN

FIGURE 3

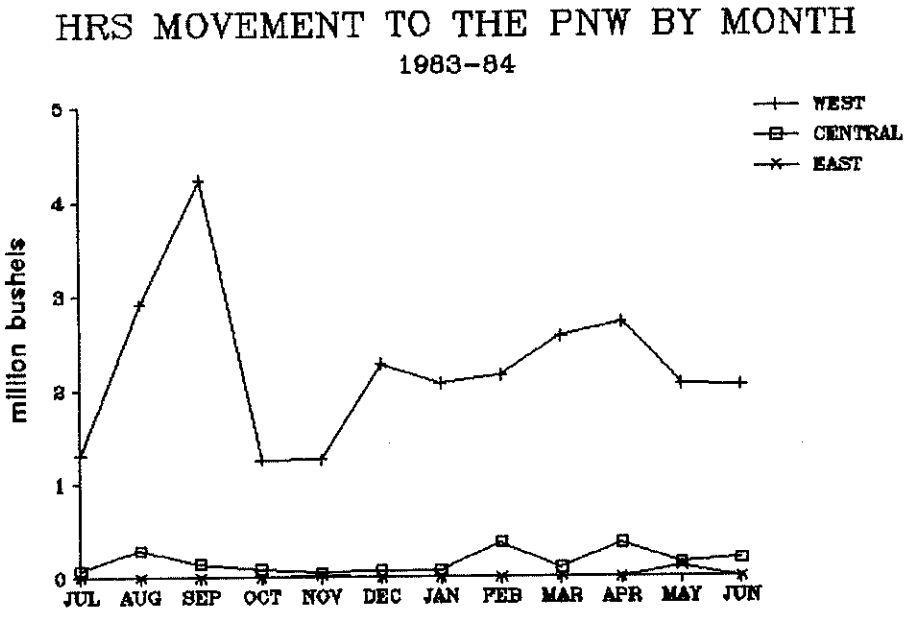
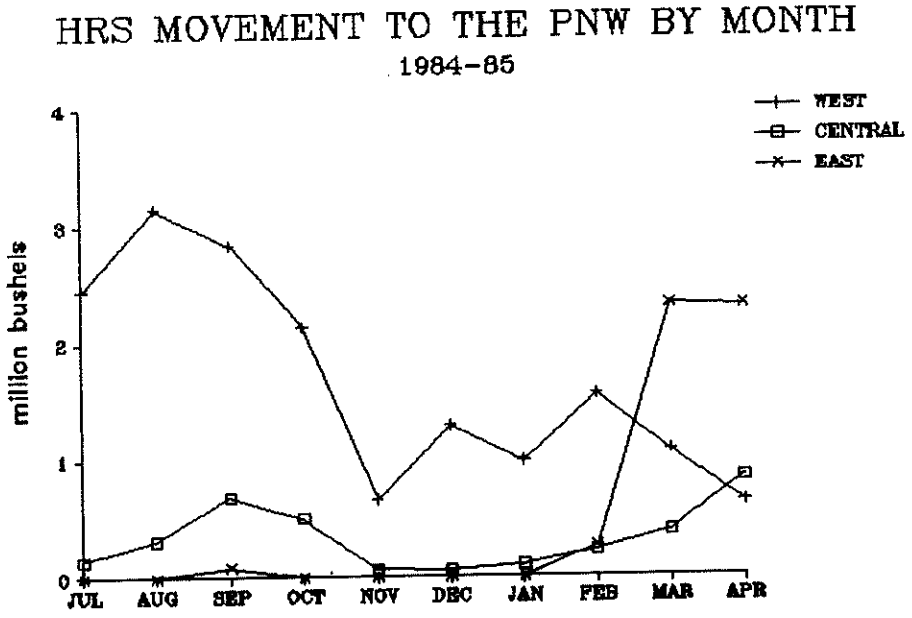

HRS MOVEMENT TO THE PNW BY MONTH
1983-84
WEST
CENTRAL
EAST
million bushels
0
1
2
3
4
5
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN

FIGURE 4


HRS MOVEMENT TO THE PNW BY MONTH
1984-85
WEST
CENTRAL
EAST
million bushels
4
3
2
1
0
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR

Minneapolis/St. Paul (eastern) markets. Factors such as grain quality, ocean freight rates, barge rates, rail car supply, etc., may influence deviation from "traditional" marketing patterns, but generally HRS wheat flows (as well as other grains) are fairly consistent.

Tomek and Robinson illustrated how changes in market prices and transfer costs can affect the boundary between markets (Figure 5). Changes in prices, transfer costs or any combination thereof will effectively cause a shift in the boundary between the markets. Such changes will ultimately affect producers who supply the markets. Figure 5 illustrates a shift in a market boundary due to an increase in price at Market B from $5 to $6 and a 20 percent decrease in transportation costs to Market B. The boundary shifts to the left and effectively allows producers who switch from supplying Market A to Market B to realize a higher net price.

A similar occurrence happened when country elevators located in eastern North Dakota started supplying a considerable amount of HRS to the PNW market during the February to April, 1985 period. This shift in movement occurred at a time when HRS prices at the PNW were falling relative to prices at MSP (Table 2). Thus, transport costs and other factors that affect net price were inducing country elevators located in eastern North Dakota to shift from supplying eastern markets to supplying western markets (or more accurately both markets). Eastern North Dakota shippers were in effect displacing shippers who traditionally supply the PNW market with HRS (shippers that are located in the western part of the state).

Because rail contract specificity does not allow disclosure of specific terms it is impossible to analyze all factors that contributed to this shift in marketing patterns. However, the interaction of market price, transfer costs and other factors resulted in country elevators located in eastern North Dakota to substantially increase their movements of grain to the PNW,

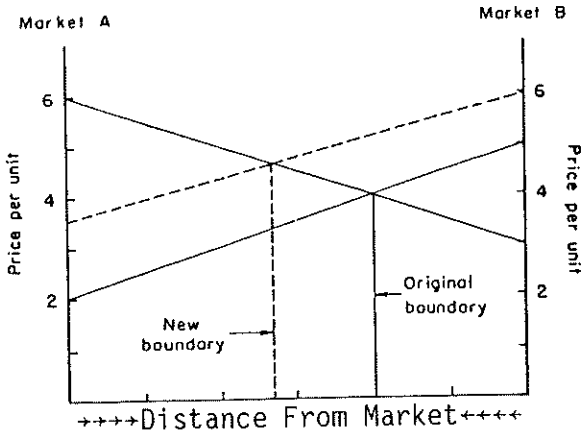


Figure 5. Effect of Changes in Market Prices and Transfer Costs on the Boundary Between Markets.

Source: (Tomek and Robinson)

TABLE 2. PORTLAND/MINNEAPOLIS PRICE SPREADS FOR NO. 1 DARK NORTHERN SPRING WHEAT (14% PROTEIN), 1985.

Day	Month			
	January	February	March	April
	(¢/bu.)			
1		.59	.59 3/4	.54 1/4
2	.71 1/2			.53 1/2
3	.68			.50 1/2
4	.67 1/2	.59		.50 1/2
5		.59	.61 3/4	.54
6		.58	.59 3/4	
7	.67 3/4	.58 1/2	.56	
8	.68 1/2	.57 1/2	.56	.50
9	.67 3/4			.52 1/2
10	.68 1/2			.52 1/4
11	.65 1/4	.57	.57 1/2	.51
12		.55 1/2	.57	.48
13		.50	.58 1/4	
14	.63	.50 1/4	.58 1/2	
15	.61 3/4	.51 1/4	.57	.49
16	.60			.50 1/4
17	.60 1/2			.49 3/4
18	.61 1/2		.57 1/4	.49 3/4
19		.51 1/4	.56 1/4	.49 1/2
20		.53	.54 1/4	
21	.63 1/4	.55 1/2	.53	
22	.63 1/4	.55 1/4	.53 3/4	.49 1/2
23	.63			.49
24	.62 3/4			.50
25	.63 1/2	.57 1/4	.52 3/4	.48 3/4
26		.57 1/2	.52	.49 1/2
27		.59	.53	
28	.63 1/2	.59 1/4	.54 1/2	
29	.65		.53 3/4	.53
30	.61 1/4			.54
31	.59 3/4			

thereby realizing a higher net benefit than if they supplied only the MSP market. Otherwise, little or no HRS would have been shipped to the PNW from eastern shippers.

V. Uncertainty

According to Knight a manager faces uncertainty when the probabilities associated with the outcomes of a production process are unknown. Country elevator managers were fairly certain as to their competitors' freight rates, at least in the extreme short-run, before contract rail rates were permitted. However, contracts now allow rapid adjustments in rates and relative rate levels. Thus, a country elevator manager may gain a shipping advantage to a given market over a competitor by negotiating a contract with the railroad. The manager who negotiated the contract reduces uncertainty by locking in the essential terms of the contract. However, the other elevator manager is faced with greater uncertainty since the competition is now shipping grain under a contract rate rather than a published tariff rate.

Hard red spring wheat prices at Portland fell dramatically in relation to Minneapolis futures prices shortly after eastern North Dakota shippers negotiated the rail contracts (Table 3). The 8 to 16 cents per bushel drop in the Portland prices (depending on protein levels) from February 8 to February 11 demonstrates what can happen in a market when marketing factors change. Again, these price changes coincide with the effective dates of the rail contracts that were negotiated by managers of country elevators that are located in eastern North Dakota.

Nonparties to the contract were effectively priced out of the PNW market for a short time because of the dramatic drop in the Portland prices relative to the Minneapolis futures price.[3] Elevator managers typically use marketing tools to protect themselves against such adverse price

TABLE 3. PORTLAND HARD RED SPRING WHEAT CASH PRICES RELATIVE TO NEARBY MINNEAPOLIS FUTURES PRICE, FEBRUARY, 1985.

Date	Protein Level				
	12%	13%	14%	15%	16%
	(¢/bu.)				
2-1	+66	+78	+93	+101	+109
2-4	+64	+76	+91	+99	+107
2-5	+64	+76	+91	+99	+107
2-6	+64	+76	+91	+99	+107
2-7	+64	+76	+91	+99	+107
2-8	+64	+76	+91	+99	+107
2-11	+48	+69	+83	+87	+91
2-12	+48	+69	+83	+87	+91
2-13	+44	+65	+79	+83	+87
2-14	+44	+65	+79	+83	+87
2-15	+45	+66	+80	+84	+88
2-19	+45	+66	+80	+84	+88
2-20	+45	+66	+80	+84	+88
2-21	+45	+66	+80	+84	+88
2-22	+43	+64	+78	+82	+86
2-25	+45	+66	+80	+84	+88
2-26	+45	+66	+80	+84	+88
2-27	+46	+67	+81	+85	+89
2-28	+48	+69	+83	+87	+91

movements (basis trading). However, when knowledge is less than perfect, and in this example when uncertainty is increased, elevator managers receive weaker signals from the market. Managers of elevators located in western North Dakota could have (and probably would have) protected themselves against this price movement had they some indication that a rail contract was being negotiated by managers of elevators in the eastern part of the state.

VI. Conclusions

Hard red spring wheat flows and prices changed significantly during the period the three rail contracts were in effect. Monthly HRS shipments from eastern North Dakota to the PNW increased from less than 100,000 bushels to over 2 million bushels in March and April, 1985. The increased movement occurred at a time when prices at the PNW were declining relative to prices at MSP. Both grain flow and price data indicate how markets can become distorted when freight rates change significantly in one region relative to another region. Managers of elevators located in eastern North Dakota gained a shipping advantage over managers of facilities in the western part of the state through the rail contracting process. Uncertainty increased for shippers who did not participate in the contract since knowledge of rates and other marketing factors were not readily accessible.

It is difficult to weigh the overall costs and benefits of the three rail contracts that have been discussed in this paper. On the one hand, certain shippers were effectively priced out of the PNW market for a time. However, shippers that were parties to the contract were able to penetrate a nontraditional market and presumably realize higher net prices.