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PRICE SPREADS AND SHIPMENT COSTS IN THE WHEAT EXPORT TRADE OF CANADA

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These surveys are supplemented by intensive studies bearing on the appraisal of the wheat situation and outlook and upon related matters of national policy. Typical subjects are indicated in the list of studies shown on the fourth cover page of this issue.

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I. THE PROBLEM

It is generally assumed that the prices of wheat in exporting markets, such as Kansas City, Winnipeg, and Buenos Aires, approximate prices in Liverpool less shipment costs. This assumption implies, of course, comparable grades in the two markets compared. It is generally recognized that over short periods prices in individual markets are frequently "out of line" —to use the trade expression — because it takes time for news to travel and for influences to be registered on published price quotations; but if a market is engaged in international trade such a situation is regarded as strictly temporary and is expected to be corrected by the "spreading" operations of traders. Now and then, local conditions may cause a market to deviate from the international level, but in such case also, "spreading," or international arbitrage, is expected shortly to correct the difference. It is true that during a season of small production, or indeed during parts of other seasons, an individual country may have little wheat for export and consequently prices there may be continuously above the c.i.f. Liverpool price less costs of shipment. Except under such conditions, the difference between prices in importing and exporting markets is generally supposed to approximate the costs of shipping the wheat. An even broader assertion is commonly made: that prices in exporting markets are *determined* by the Liverpool price less costs of shipment to that great importing market.

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Contrary to this theory, British grain dealers have recently asserted that it is common for wheat to be bought in Liverpool for less than its c.i.f. value on the current price basis in exporting markets. One member of the trade, testifying recently before the Royal Commission on Food Prices, stated that North American, Argentine, Indian, and (to a less extent) Australian wheat can always be bought in Liverpool for less than its current price in the export market plus what it costs to move it to Liverpool. Other witnesses emphasized the fact that this is a normal characteristic of the trade at all seasons of the year. Confirmatory of these views, an American exporter of long experience has recently said that Liverpool is largely a dumping market. The Commission itself, while it reached the conclusion that such assertions did not hold for the bulk of the trade, was convinced of the

existence of the phenomenon and found some difficulty in accounting for it.

In view of the widespread acceptance of the orthodox doctrine first mentioned, and the basic importance attributed to it, the accuracy and the significance of these modifications deserve examination. The examination involves a statistical study of price spreads between export markets and Liverpool and a comparison of these price spreads with costs of shipment. Such a study, by revealing variations in price spreads and various elements in shipping costs and practices, throws light upon the factors affecting spreads and certain seasonal characteristics as well as upon the validity of the usual theory and the qualifications recently suggested.

The present study is based primarily upon the relation of Liverpool prices of Canadian wheat to Winnipeg prices, and the costs of shipping wheat from Winnipeg to Liverpool. Canada is the largest single exporter of wheat to the United Kingdom, her exportation exceeds her domestic utilization, her trade is centralized in Winnipeg: these facts would lead one to expect this comparison to furnish a simple illustration of the normal relation between the so-called world price of wheat and the price in an active export market.

The outstanding characteristics of Canada's export trade are summarized briefly, preliminary to the examination of prices and costs, which is taken up in the third, fourth, and fifth sections. The final section presents our summary and conclusions. The exact nature of the quotations used as the basis for the price comparisons will be described in detail, because quality, grade, position, and even hour of the trading day, are responsible for differences amounting frequently to several cents a bushel. Where these differences are great they may largely or entirely obscure the true relationship between price spreads and shipment costs.

II. CHARACTERISTICS OF THE EXPORT TRADE IN CANADIAN WHEAT[1]

Salient Facts

Canada is consistently on an export basis as regards wheat. In years of small crops as well as years of large ones, she has a substantial exportable surplus.[2] Her exports are especially heavy immediately after harvest in the autumn and again in the spring when the lakes are reopened to navigation; but day by day, in and out of season, sales of considerable dimensions are made. Moreover, her trade is almost exclusively in one type of wheat, hard red spring, grown for the most part in the prairie provinces. In this regard she differs markedly from the United States, which exports five different classes of wheat grown in different parts of the country. The bulk of the Canadian trade is with Great Britain. During the four crop years, August 1921 to July 1925, 73 per cent of her wheat grain exports were directed to the United Kingdom, only 17 per cent to other parts of Europe.[3] Much of the wheat which is eventually used on the Continent is bought by British merchants for resale elsewhere in Europe.

Furthermore, Winnipeg is the only important Canadian wheat market, and consequently the prices registered on the Winnipeg Exchange represent a large proportion of the trade. Located at the outlet

[1] On this subject see fuller discussion of certain phases in Theo. D. Hammatt, "Marketing Canadian Wheat," *Trade Information Bulletin 251*, August 1924; and Wheat Studies, July 1925, *Canada as a Producer and Exporter of Wheat*, especially pp. 251–66.

[2] The salient facts of the Canadian wheat disposition in the past four crop years (August to July) appear in the following tabulation:

(Million bushels)

Item	1921–22	1922–23	1923–24	1924–25
Crop	301	400	474	262
Domestic utilization	97	128	114	87
Net exports: wheat	151	230	292	147
wheat and flour	185	279	346	192

[3] The following figures summarize the destinations of the wheat (grain) exports as reported by the Canadian government:

(Million bushels)

Crop year Aug.–July	United Kingdom	Other Europe	United States	Other countries	Total
1921–22	105.9	26.3	14.9	3.9	150.9
1922–23	175.2	36.2	14.0	4.4	229.8
1923–24	201.5	52.3	22.0	16.6	292.4
1924–25	116.8	22.9	3.2	4.1	147.0

of the great wheat-growing belt and supplied with lake terminals at Fort William and Port Arthur, Winnipeg is admirably adapted for the handling of wheat for export. As a matter of fact, more wheat is sold there than in any single market in the United States. Finally, Canada's wheat exports regularly exceed her domestic utilization, thus linking her very closely with the international market.[1]

Trade Practices

Until 1924–25 (except during the period of government control, 1917–20) the Canadian export business was handled largely by private individuals and organizations. In 1923–24 the Canadian wheat pool began to be a factor in the trade; in 1924–25 it operated on a large scale; and in the present year it is the dominant factor. The pool takes the farmer's wheat at the country elevator and sees it through to the foreign miller or grain importer. Under the earlier system, which was prevalent through most of the period under review and which still persists in a measure, export practices varied widely. Some wheat was bought by exporters at Winnipeg or even in the country and then carried to the seaboard and overseas by the same agency. In most cases, however, the exporter operated mainly at the seaboard, depending upon lake shippers and fobbers to deliver the wheat to terminals at the eastern end of the lakes or at the seaboard. In the trade with the United Kingdom, export sales were usually to importers rather than direct to millers, while the continental trade was generally handled through brokers as well as importers. Where possible the wheat was shipped or routed direct to the importing mills in order to avoid port storage charges.

Private exporters handle grains of all kinds, and the pool is broadening its operations to include other grains than wheat. Private exporters, except where they are merely branches of European import houses, operate largely on a cost-plus basis. Under ordinary conditions, they accept "firm" offers for wheat[2] either f.o.b. North American port or c.i.f. European port, when they calculate that the prices offered include a margin for themselves beyond all costs for fulfilling the contract, as they are able to determine them for each transaction. Or conversely, the exporter may take the initiative, and make a firm offer of wheat.

The pool does not make a practice of hedging, but owing to its high degree of control over Canadian supplies it is in a very strong market position. The transactions of other North American wheat exporters are hedged. If an exporter accepts a firm offer for the sale of wheat that he does not possess, he hedges by buying a future to protect himself while he is purchasing the wheat to fulfil the order; when the cash wheat is secured, he closes out his hedge. If, on the other hand, the exporter, anticipating foreign requirements, has accumulated a stock of cash wheat, this he hedges as rapidly as purchased; when, thereafter, it is sold either on the initiative of the exporter or by acceptance of an importer's offer, this hedge is closed out. Finally, if an exporter, in possession of wheat protected by a hedge, is unable to make a satisfactory sale and undertakes to ship the grain on open consignment in the hope of making a sale afloat or on arrival at the European port, the hedge is maintained (under increasing difficulties) until the sale is finally accomplished. No matter which method of trading is actually concerned, the American fobber or exporter of commercial type as a rule hedges his transactions act by act and day by day. Skilled exporters lose money only through the occurrence of what may be termed accidents—delay of rail deliveries, failure of charters, losses through arbitration of condition of grain, refusal of acceptance by European buyers, and the like. The business is, therefore, essentially a cost-plus business conducted on a narrow margin and yielding profit proportionate to volume of operations, turnover of capital, and sagacity of management.

The wheat import business of Europe is in the main a speculation in cash wheat. Most of the importing houses deal in other

[1] See footnote two, p. 178, above.

[2] I.e., a bid at so much over or under the nearest option in a certain market for a certain amount of wheat f.o.b. vessel at designated port for specified loading.

grains, some of them also in oil seeds, concentrated fodders of all kinds, and pulses. The business is a joint-product operation with wheat as the largest single item. European importers make purchases in North America largely on the basis of firm offers proceeding from them, though in some seasons the initiative lies rather with the exporters. Except as a protection against the possibility of unusual losses in what are regarded as abnormal times, they do not hedge because they count on their ability to make a speculative gain in a majority of transactions. Their offers are based only in part on prices in Europe on the day of offer, in part on anticipated prices at which they expect to be able to sell the wheat of the particular transaction at some future time. European wheat importers, in particular the British, make purchases in Argentina, Australia, and India, not only on this basis, but large advance purchases as well. It is essentially correct to speak of the European wheat importer as a speculator in cash wheat and in contrast with this to define the North American grain exporter as a broker in f.o.b. or c.i.f. wheat.

Export Routes

The great bulk of Canadian wheat for export moves through the shipping points at the head of the lakes—Fort William and Port Arthur—thence eastward by various routes to the sea. Since the war Vancouver[1] has been rising in importance as a port of shipment for wheat from Alberta and Western Saskatchewan, especially during the winter months. A considerable fraction of this wheat, however, goes to the Orient.

From Fort William and Port Arthur there are several alternative export routes to the Atlantic. The most important is by lake to Buffalo, thence by rail to United States Atlantic ports.[2] Second in importance is an all-water route, by lake boats to Port Colborne on Lake Erie, thence by smaller vessels to Montreal or Quebec. A third route is by lake vessels to Georgian Bay ports or Goderich (on Lake Huron), thence by rail to Montreal, St. John, Portland (Maine), or other United States ports. Still another possible route is by lake steamers to United States lake ports other than Buffalo and thence by rail to the Atlantic seaboard.[3] Finally, the all-rail route to Atlantic ports may be used in case of necessity. During the four years under consideration, however, only about 5 per cent of the tonnage moved in this way. The proportions vary from year to year.

The lake movement is concentrated between April and December because of the closing of navigation in the winter months. Exportation from Halifax and St. John in Canada and from any of the American seaports can continue during the winter, but unless the wheat has been moved down the lakes prior to the closing of navigation it must be shipped by rail from country points or from Fort William direct to the seaboard. Since the latter method of shipment is ordinarily more expensive than the lake route, it is the practice of the trade to concentrate wheat at eastern lake points late in the "open" season for shipment by rail to the seaboard during the winter. It is not unusual for as much as 30 million bushels to be stored at Buffalo in December and for from 5 to 10 million bushels to be stored at Georgian Bay ports. The major portion of this wheat is usually stored in terminal warehouses, although in some years as much is stored in lake vessels as in warehouses at Buffalo.

The largest proportion, though not all, of the shipments from Fort William are for

[1] In 1923–24, Vancouver shipped a record volume of nearly 60 million bushels (including flour); in the current year this record may be surpassed.

[2] Sometimes Canadian wheat is transhipped from Buffalo to Montreal.

[3] The following table summarizes the lake movement from Fort William according to ports of destination, during the crop years 1921–22 to 1924–25, as reported in the annual *Report on the Grain Trade of Canada* and in *Canadian Grain Statistics:*

(Million bushels)

Crop year Sept.–Aug.	Total	To Buffalo	To Port Colborne and Montreal	To Georgian Bay ports and Goderich	To U.S. ports other than Buffalo
1921–22.....	176.1	97.0	30.0	43.5	5.0
1922–23.....	229.8	96.5	46.4	62.0	23.6
1923–24.....	284.1	126.5	69.9	62.0	24.1
1924–25[a].....	154.3	70.9	46.3	34.8	2.3

[a] Crop year August–July.

For more complete analysis of Canadian shipments, see Hammatt, *Marketing Canadian Wheat*, pp. 72–86.

export overseas or to the United States. In the four years 1921–22 to 1924–25 only about 6½ per cent of the shipments from the upper lake ports were retained for use in Eastern Canada. Approximately one-third of the overseas exportation is via Canadian ports, of which Montreal is the most important, while the other two-thirds are shipped via American ports.[1] New York harbor handles a volume roughly comparable with that moved via Montreal, but the shipments are less heavily concentrated, since New York harbor is open for navigation throughout the year, while Montreal is closed from December to April. November and May are usually the months of heaviest exportation from Montreal. Philadelphia, Baltimore, and certain other American ports at times handle large quantities of Canadian wheat for export but are generally less important than New York or Montreal.[2]

Not all the wheat cleared from Fort William for export to Europe actually reaches the other side of the Atlantic. American millers frequently purchase Canadian wheat at Buffalo for milling in bond and export as flour.

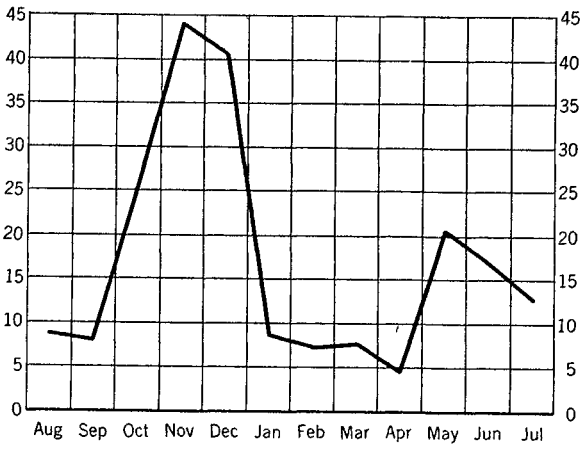
Rate of Exportation

Partly because of the date of harvest and partly because of transportation conditions, the Canadian trade has two distinct seasons. As is indicated in Chart 1, it is heaviest immediately after harvest—i.e. in October, November, and December. Though lake navigation usually closes early in December, export statistics show a heavy volume in that month. Thereafter, exports decline abruptly, and remain light through most of April. Indeed, they are usually lower in April than in any other month. With the reopening of navigation, however, they reach considerable volume in May, but decline thereafter to moderately low levels in August or September as supplies from the preceding year's crop are exhausted. The average monthly exports of wheat grain in the four complete years under review were, in thousand bushels, as follows:

Aug.	8,790	Dec.	40,596	Apr.	4,480
Sept.	7,986	Jan.	8,567	May	20,562
Oct.	25,521	Feb.	7,162	June	16,962
Nov.	43,937	Mar.	7,631	July	12,846

Chart 1. — Seasonal Variation in Canadian Wheat Exports, Monthly, 1921–22 to 1924–25*

(Million bushels)



* For data, see Appendix Table XI.

[1] *Report of the Special Committee [of the Senate of Canada] appointed to Inquire into Conditions Responsible for the Routing of a Large Proportion of Canadian Export Trade via American instead of Canadian Ports*, 1922, p. 131, presents evidence to the effect that Montreal is the cheapest port for shipments to the United Kingdom, and that consequently the shipments from there are to the United Kingdom while those via American ports include most of the shipments to the Continent as well as shipments to the United Kingdom.

[2] The following table shows Canadian wheat exports from Eastern Canadian and American ports, 1921–22 to 1924–25, as reported in the annual *Report on the Grain Trade of Canada* and the monthly *Canadian Grain Statistics*, supplemented by data supplied directly by the Dominion Bureau of Statistics:

(Thousand bushels)

Crop year Sept.–Aug.	Montreal	St. John	Other Canadian ports	New York	Philadelphia	Baltimore	Norfolk	Boston	Portland	Total Canadian	Total United States
1921–22	27,584	6,605	647	39,682	28,117	7,738	.....	5,068	9,239	34,836	89,844
1922–23	54,376	12,014	2,655	47,757	26,104	15,600	.....	7,950	18,389	69,045	115,800
1923–24	61,259	9,412	2,309	63,091	23,225	14,990	12,568	7,173	7,713	72,980	128,760
1924–25	39,400	5,624	316	36,522	16,293	6,076	331	977	3,162	45,340	63,360

Methods of Shipment

Shipments from the seaboard may be made direct to points of destination and sale; may be sold by the exporter at the time of shipment, but routed to eventual destinations after leaving the seaboard; or may be shipped by the exporter while still unsold. The bulk of Canadian wheat is shipped under the first or second conditions. If the destination is known when the wheat is sold, it is shipped direct. But it is common for the importer to purchase the wheat before he has a customer for it. In the latter case the destination may be determined after the wheat is afloat, and it is then known in the trade as "afloat for orders." Wheat unsold in European ports may have been shipped direct from exporting countries by exporters or importers on the chance of sale en route, or may be resale wheat which for one reason or another has been thrown back on the market. Wheat in such position is regarded as "in distress" and usually must be disposed of at a bargain. Wheat is never shipped to Liverpool unsold unless the shipper can find no other disposition for it.

The usual method of transatlantic shipment is in parcels via cargo liners, although a portion is shipped in full cargoes via tramp steamers. The hand-to-mouth buying that has characterized the post-war trade has increased the proportion of parcel shipments.

III. WINNIPEG-LIVERPOOL PRICE SPREADS

The Price Data

For the purpose of comparing Winnipeg and Liverpool prices during the period April 1921 to December 1925, we have used the Friday price of No. 1 Manitoba in both markets. The Winnipeg price of this wheat is the official *closing* cash price on the Winnipeg Grain Exchange for wheat in store at Fort William or Port Arthur. The Liverpool price is that reported by the International Institute of Agriculture. Prices quoted by this organization are stated to be "extracted from the Produce Exchange Reports or other trustworthy sources, or else . . . . communicated by the Institute's correspondents duly authorized by the respective governments. The quotations given are generally those at the close of business and are those for early delivery unless otherwise indicated."[1] The quotations used refer as a rule to *parcels afloat,* but are on the c.i.f. Liverpool basis. In both cases the prices were converted to United States currency before the spreads were computed.[2] The reasons for the selection of these particular quotations to be used as the basis for the Winnipeg-Liverpool price comparison are indicated in the following paragraphs.

No. 1 Manitoba wheat constitutes an important fraction of Canadian wheat exports. According to the Dominion Bureau of Statistics, 30 per cent of the total spring wheat inspected in 1921–22 was No. 1 Northern, 66 per cent of that of 1922–23, 37 per cent of that of 1923–24, and 19 per cent of that of 1924–25. In other words, in two out of the four years under consideration approximately one-third of the crop graded No. 1, while in one year, two-thirds of the crop was of this grade. In the fourth year the fraction was distinctly smaller. In the absence of definite information, it seems reasonable to assume that exports were at least in much the same ratio. Even if the ratio was somewhat lower, the comparison would still be of significance. In Winnipeg, No. 1 serves as the basis grade to which the prices of lower grades are related. The fact that the grade is consistently quoted in Liverpool is, in itself, an indication that it is regularly available there.

Winnipeg cash quotations are ordinarily for wheat in store at Fort William or Port Arthur.[3] The position of wheat quoted at

[1] See *International Crop Report and Agricultural Statistics,* January 1926, p. 48. Similar statements are made monthly.

[2] These two series of prices and the spreads between them are given in Appendix Tables I, II, and III.

[3] Although Fort William and Port Arthur are 400 miles from Winnipeg they are essentially a part of the Winnipeg market, since practically all wheat outside of country holdings is stored there except that which is sold for provincial uses.

Liverpool is much more difficult to determine. Broomhall[1] quotes wheat afloat, both in cargoes and in parcels, and in store at Liverpool and Birkenhead. As it is customary to ship Canadian wheat in parcels rather than in cargoes and to avoid storage in Great Britain, the quotation for parcels afloat is probably more representative than any other. Yet wheat afloat may not be available to British mills for two weeks, three weeks, or even longer.

There was no choice in the matter of using the closing quotation at Winnipeg because no other is regularly published. It is not customary to distinguish Liverpool prices as opening, closing, high, or low, and no median or average quotations are available.

The difference in time between Liverpool and exporting markets is a qualifying factor in any comparison of prices. The Liverpool business day is about over when the Winnipeg day is commencing, while the closing price at Winnipeg is that of several hours later. In view of the fact, however, that a comparison of, say, a closing price on Friday at Winnipeg with a Saturday price in Liverpool would be even worse than a comparison of Friday prices in the two markets, it is better to compare prices of the same day in the two markets than to compare those of successive days. The use of weekly average prices in the two markets would have largely eliminated this difficulty, but since the International Institute published consistent series for Fridays it was decided to use these in spite of the advantages that might be obtained from more comprehensive data.

In practice, the hazards arising from the difference in time between Liverpool and North American markets are largely taken care of by the system of options known in the trade as "puts and calls." By this system the exporter "covers" himself in the contract market between the close of trading of one day and the opening on the next, thus avoiding losses that might occur as a result of market changes over night.

[1] Reference is to the files of George Broomhall's *Corn Trade News*, the recognized trade medium. The Liverpool Corn Trade Association does not publish quotations, but the secretary states that Broomhall's figures may be accepted as "generally absolutely accurate."

[2] Computed by averaging the first five weeks and plotting this average at the third week, then the five weeks beginning with the second week and plotting this average at the fourth week, and so on.

The Price Spreads

Chart 2 (p. 184) shows graphically the relation between these two series of quotations, for the years 1921–25. The upper portion of the chart indicates the course of Friday prices in the two markets, and the lower portion shows the spreads between them in actual amounts (vertical bars) and in the form of a five-weeks moving average (curve).[2] The abnormally wide spreads of the first three or four months of the period are accounted for mainly by the fact that British prices were under government control until April 1921 and a normal relationship was not re-established between Liverpool and exporting markets till several months later. Apart from that period, however, there are certain seasonal characteristics in the spread. In general it is wider from about harvest time in September or October until March or April than in the other six months of the year. There is no uniformity within these two portions of the year. The high point of the season is usually in mid-winter, but in one instance (1922–23) the autumnal peak was higher. The lowest spread usually occurs in the summer, but apparently with no uniformity as to month. The November spread, though usually lower than that of October or December, is nevertheless higher than the low spread of the summer. On the whole, the irregularity in the spread is impressive, even if one disregards the occasional instances of transitory variations.

Several different recurrent factors apparently influence the spread. When the new Canadian crops first come on the market, Winnipeg prices are likely to weaken sooner than Liverpool, and the spread consequently widens. As the grain is exported, however, Winnipeg tends to come into more normal alignment with Liverpool and the spread declines again. With the closing of navigation on the Great Lakes and the St. Lawrence, and prior to the time when Argentine and Australian supplies become

internationally available, Liverpool prices are likely to advance more (or decline less) than Winnipeg prices, and the spread is again increased. As a rule this period is followed by a fairly continuous narrowing of spreads owing to the greater strength of prices in Winnipeg than in Liverpool, interrupted by a brief increase at the time of the reopening of navigation when the shipment of Canadian supplies fills the gap between the peak of Southern Hemisphere shipments and heavy shipments from the United States.

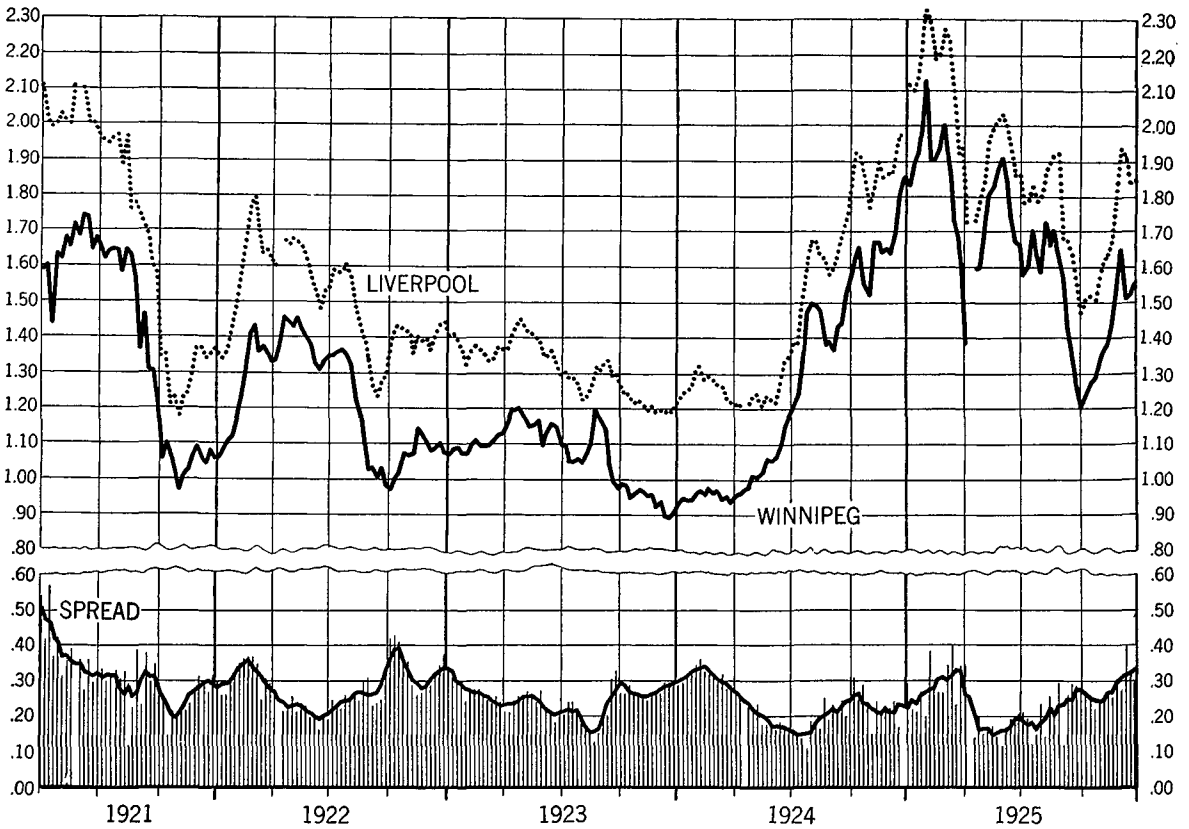
Although variation rather than uniformity characterizes these spreads, there is some significance in striking certain averages for comparison with shipment costs. The greatest difference in costs of shipment appears between the seasons of open and closed navigation. For this reason the weekly price spreads have been averaged for the periods April–November and December–March as well as for each of the crop years under consideration. These averages are presented in Table 1.

These averages emphasize the fact that the spread tends to be greater during closed navigation than when the lakes are open. During the past four summer seasons the spreads ranged from 20 to 26 cents, while during the winter they ranged from 27 to 31 cents. These figures also indicate that the spread has been fairly consistently declining during the past three years. The decline amounted to 5 cents in the three years from 1922–23 to 1924–25.

As indicated above, the Liverpool prices used in this comparison are for No. 1 Mani-

CHART 2.—PRICES OF NO. 1 MANITOBA WHEAT AT WINNIPEG AND AT LIVERPOOL, AND SPREADS BETWEEN THESE MARKETS, WEEKLY FROM APRIL 1921 TO DECEMBER 1925*

(U.S. dollars per bushel)



* For data, see Appendix Tables I, II, and III. In the lower section of the chart, the vertical lines designate actual spreads, and the curve represents a five-weeks moving average centered.

toba *afloat in parcels* for Liverpool. If instead of this quotation we had used one for the same grade of wheat on the same days of the week but for *cargoes afloat* or wheat *in store,* the spread would have averaged several cents higher in the first case and about 9 cents higher in the second.[1]

TABLE 1.—AVERAGE SPREAD BETWEEN PRICES OF No. 1 MANITOBA WHEAT AT WINNIPEG AND LIVERPOOL, 1921 TO 1925*

(U.S. cents per bushel)

Year	Apr.-Nov.	Dec.-Mar.	Aug.-July
1921–22	30.5	30.7	26.3
1922–23	26.2	28.5	27.2
1923–24	22.9	30.5	24.1
1924–25	20.0	26.9	22.1
1925–26	20.9	....	....

* Detailed data are given in Appendix Table III.

No other quotation for No. 1 Manitoba at Winnipeg is available. However, if *high, low, median,* or *average* quotations of the day were published, they might possibly show figures (for the periods indicated in the table above) varying as much as 2 or 3 cents from those based on *closing* quotations.[2]

Emphasis is placed upon the price differences that arise from variations in the position or availability of wheat, from the way it is shipped, or the hour of the day at which it is bought, because of the importance of such considerations in determining profits. The international wheat trade is operated on narrow margins, and the difference of a cent or two may determine whether a transaction is profitable or the reverse. The price spreads really represent the opportunity for transactions rather than the occurrence of them.

IV. SHIPMENT COSTS, WINNIPEG TO LIVERPOOL

Shipping costs from Winnipeg to Liverpool may be classified in four groups: (1) for water transportation, (2) for rail transportation, (3) fobbing costs, and (4) interest and insurance. Both lake and ocean freight rates fluctuate a certain amount from season to season and from week to week. Rail rates and fobbing costs, on the other hand, are quite uniform (although there have been reductions in rail rates during the period of this study), while the interest charges vary according to the amount of time the wheat is carried, and insurance costs vary slightly according to routes and methods of transportation. Since over most routes all four elements enter into costs of shipment, the total varies more or less both within a season, and from one season to another.

The nature of the Canadian trade is such that a study of transportation costs naturally falls into two parts: (*a*) for the period of the year when the Great Lakes are open to navigation, and (*b*) for the winter months. As already indicated, during the period of open navigation, a number of alternative routes are available to the seaboard, varying in expense and length of time required. During the winter, on the other hand (disregarding Vancouver), wheat must either be shipped by rail all the way from interior points or else be stored at the eastern end of the lakes at the close of the open season and transported thence as required during the winter. In the latter case, the marketing process is more complicated than when the wheat moves directly from the head of the lakes to Europe. It

[1] As a matter of fact, it is not always possible to obtain Liverpool quotations for No. 1 Manitoba wheat in *parcels, cargoes,* and *spot* on the same day. The following table shows the relationship of these various types of quotations as indicated by averages applying in all cases to the same days. The quotations are from Broomhall's *Corn Trade News* and are expressed in U.S. dollars per bushel.

Aug.-July	Number of Items	Parcel	Cargo	Spot
1921–22	15	1.38	1.42	1.47
1922–23	36	1.36	1.40	1.45
1923–24	17	1.30	1.31	1.39
1924–25	7	1.91	1.97	2.00

[2] The Food Research Institute has recently obtained daily high and low quotations for No. 3 Manitoba at Winnipeg for the period from July 1923 to September 1924. The range is relatively small, especially during periods of light trading, but not infrequently is 2 to 4 cents.

has passed out of the Winnipeg market—and therefore is no longer a direct influence on prices there—but may not reach Europe for a month, two months, or even longer. Or it may be diverted from the wheat export trade altogether, and be manufactured in bond in the United States and exported as flour.

Open Navigation

In the five years under consideration the quoted water-and-rail rate from Fort William to New York via Buffalo averaged 12 cents a bushel, about ½ cent higher than the water-and-rail rate to Montreal and 2¼ cents higher than the all-water rate to Montreal. Shipment costs to Philadelphia and Baltimore via Buffalo were about ¼ cent lower than to New York because of rail differentials in their favor. In one year of the four, however, the water-and-rail rate from Fort William to Montreal was slightly higher than to New York and in one year the all-water rate to Montreal was only a little under 2 cents lower than the water-and-rail rate to New York.[1] But throughout this period, water-and-rail rates to Montreal and American ports were at times on a strictly competitive basis, although usually the rates to American ports were slightly higher than those to Montreal.

Table 2 shows average rates from the opening of navigation (usually in April) to the end of November from Fort William to Montreal and New York during the five seasons 1921 to 1925. An examination of the weekly freight rates by any one of these routes shows a moderate decline in most seasons in June, July, and August from the higher point of April and May, but an advance again at the end of the season. The advance in rates in September results from the heavy demand placed upon tonnage by the movement of the Canadian crop. Rates for final trips frequently include winter storage charges at Buffalo or Georgian Bay ports.

From Table 2 it is apparent that it is in spite of higher freight rates to the seaboard that so much of the Canadian wheat is shipped via Buffalo and other United States ports instead of via Montreal. There are several reasons for this. The American route is open to navigation all the year around; it is more flexible than the Canadian; the American seaboard offers a larger and cheaper tonnage market than Montreal; and Buffalo is admirably located and equipped for the storage and rapid shipment of wheat to the seaboard. Besides, more tonnage is available for the Fort William–Buffalo route than for the all-Canadian route, since lake steamers flying the American flag can ply between Fort William and Buffalo, while only Canadian ships can traffic between Canadian ports.

Table 2.—Average Freight Rates on Wheat, Fort William to Montreal and New York, Seasons of Open Navigation, 1921–25*

(U.S. cents per bushel)

April through November	Fort William to New York—water and rail	Fort William to Montreal—water and rail	Fort William to Montreal—all water
1921	12.5	11.5	9.7
1922	12.1	11.9	10.4
1923	13.3	12.0	10.5
1924	11.2	11.3	9.0
1925	11.2	11.0	8.9

* *Report on the Grain Trade of Canada, 1924*, supplemented by data furnished directly by Dominion Bureau of Statistics. The weekly data upon which these averages are based are given in Appendix Tables IV and V.

Closed Navigation

The costs of shipment for wheat stored at eastern lake ports prior to the close of navigation is difficult to calculate, because it is hard to know what allowance to make for winter storage. If the wheat is to be stored in steamers, the storage charge is usually included in the lake freight rate. But since a larger proportion is stored in elevators, the lake rate does not cover total costs in the majority of cases. Similarly, there is no exact information as to the length of time the wheat is customarily held. Trade practice is to ship to Buffalo or Georgian Bay ports and store there, except when costs by this route, including storage, exceed all-rail costs.[2] Table 3 presents average rates for

[1] Because of the depreciation of Canadian currency during 1921–22, these charges were lower in terms of American money than in Canadian.

[2] Providing that the wheat so shipped is not at a premium over the December option, which might wipe out the freight advantage.

December through April for the four seasons, 1921–22 to 1924–25, based on November lake rates and winter ex-lake rail rates.[1] The 1922–23 average is abnormally high because the railroad strike in the United States in the autumn of 1922 advanced November rates. Carrying charges are estimated in the discussion of fobbing costs below (p. 188).

TABLE 3.—AVERAGE FREIGHT RATES ON WHEAT, FORT WILLIAM TO ST. JOHN AND NEW YORK, BASED ON NOVEMBER LAKE RATES AND WINTER EX-LAKE RAIL RATES, 1921–25*

(U.S. cents per bushel)

December through April	Fort William to St. John	Fort William to New York
1921–22	11.5	11.6
1922–23	14.6	14.0
1923–24	12.7	12.7
1924–25	12.9	12.4

* *Report on the Grain Trade of Canada, 1924.* Weekly lake rates and rail rates are given in Appendix Tables IV and V.

There is some question whether, in a study of the relation of price spreads to shipment costs between Winnipeg and Liverpool, consideration should be given to costs via the Buffalo–New York route for wheat stored at Buffalo. Such wheat passes out of the Winnipeg market long before it reaches Liverpool and all calculations of the relation between spreads and costs must be based on probable future developments rather than on concurrent price and cost relationships. The risks of this trade are usually carried by a number of different groups of operators, each of whom holds the wheat a relatively short period and then passes it on to the next one. Thus the lake shipper buys at the head of the lakes and sells c.i.f. Buffalo to fobbers or exporters. The latter may hold the wheat for a time and then sell c.i.f. or f.o.b. Atlantic ports to exporters or importers. These in turn may sell to one another or to European importers c.i.f. Liverpool or continental port cities. Although this element of lag presents serious difficulties in the analysis of the relation of prices to costs, it has seemed necessary to figure costs on the basis indicated above since such important shipments are so handled. During the winter prices are quotable in store Buffalo, but the relation between prices there and at Winnipeg may or may not be close, depending upon market conditions.

A certain amount of wheat is shipped by the all-rail route from Fort William to the various seaboard markets, but, as already indicated, this route is so much more expensive than alternative routes that it is comparatively little used. However, if eastward shipments are to be made direct from Winnipeg or country points in the winter they must be made by this route. Table 4 shows average year-around rail rates from Fort William to Montreal, St. John, and New York for the five years, 1921 to 1925. Rates to Philadelphia and Baltimore are the same as to New York. These rates are twice as high as the customary all-water rates via Montreal.

TABLE 4.—AVERAGE ANNUAL ALL-RAIL FREIGHT RATES FOR WHEAT ON EXPORT, FORT WILLIAM TO MONTREAL, ST. JOHN, N. B., AND NEW YORK, 1921 TO 1925*

(U.S. cents per bushel)

Year	Fort William to Montreal[a]	Fort William to St. John, N.B.[b]	Fort William to New York[b]
1921	21.3	23.7	21.0
1922	20.7	21.0	21.3
1923	20.3	20.9	21.3
1924	20.4	21.0	21.3
1925	20.7	21.3	21.3

* *Reports on the Grain Trade of Canada, 1922–24,* supplemented by data furnished directly by Dominion Bureau of Statistics. Rates expressed in Canadian money are given in Appendix Table V.

[a] Conversion to U.S. money weekly.

[b] Conversion to U.S. money monthly.

HANDLING CHARGES AND OTHER EXPENSES

The c.i.f. price in Liverpool must normally cover not only the original price of the wheat in the primary market and the cost of transportation, but in addition whatever handling charges are involved between the two markets. These include elevation and other handling charges, vessel brokerage fees, insurance charges, and interest payments, in addition to the profits

[1] Ex-lake rates cover charges from the lake boat to points of destination.

of fobbers and exporters. Though these items vary, on the whole they are considerably more stable than lake or ocean freight rates.

A reliable statement of these handling costs during open navigation, exclusive of fobbers' and exporters' profits, gives a total of 4¾ cents a bushel if shipment is made via Montreal and 5½ cents a bushel via Buffalo to New York, Philadelphia, or Baltimore. Higher elevation charges at American ports mainly account for the difference. The items run as follows (in cents per bushel):

	Via Montreal	Via New York
Fobbing charges at Fort William	1.25	1.50
Weighing, inspection, and lake shippers' charges	.25	.25
Vessel brokerage	.25	.125
Lake insurance	.50	.25
Exchange	.25	.25
Fobbing charge at Montreal or New York	.475	1.50
Selling brokerage	.25	.25
Ocean insurance	1.125	1.125
Interest	.50	.50
Total	4.75	5.50

These rates are subject to minor variations, but we are informed that they have not fluctuated materially in several years. Various estimates of a similar sort have been compiled, two of them by the Dominion Bureau of Statistics. All work out to totals varying within about half a cent of these. Obviously, interest and insurance charges vary with the price of the grain and the time it is necessary to carry it—also, in the case of insurance, with the season of the year. On the whole, it would seem that for the purpose of measuring average c.i.f. charges, the figures given are satisfactory for periods of open navigation.

During closed navigation, as indicated above, interest, storage, and insurance charges may be increased if the wheat is stored at Buffalo or Georgian Bay ports for any length of time. In some years elevator companies desiring the handling of the grain "absorb" some of these charges, but this is apparently not usually the case. Insurance charges do not amount to a high figure; storage may be included in the lake freight rate; but interest may be an important item if the wheat is held very long. With wheat at $1.50 a bushel and interest rates at 6 per cent it would cost ¾ of a cent to carry one bushel one month. Probably 1½ cents is ample allowance for additional costs of winter lake and rail shipments over summer. This would increase total fobbing costs, whether via Canadian ports or via New York, to 7 cents.

Similar costs for shipments by rail are somewhat less than for water shipments because less handling of the wheat is necessary. The following items must be included for shipments via New York (in cents per bushel):

Fobbing at Fort William	1.50
Brokerage and exchange	.40
Fobbing at New York	1.50
Interest	.50
Marine insurance	1.125
Total	5.025

Shipments via Montreal would cost about 4 cents, or a cent less than via New York.

Ocean Transportation Costs

Wheat moves overseas in tramp vessels as well as liners and in full cargoes as well as parcel lots. The tonnage market is a fluctuating one, and rates vary with the quantity of space available and the volume of merchandise to be shipped. According to trade information, parcel rates are almost uniformly for space in liners from a definite sailing port to a definite destination and are for lots of various sizes, ranging normally from a minimum of 8,000 bushels to a maximum of perhaps 200,000 bushels. They vary according to the relative demand for grain space and general cargo space.

Tramp steamers, which carry only full cargoes, do not regularly serve ports served by liners, though Montreal and New York are important ports for both liners and tramps. Consequently, in the trade as a whole, rates for parcel shipments may vary considerably from those for cargo lots. As a rule, parcel rates are lower than cargo rates, although between certain ports and at certain times they may be on a strictly competitive basis. Frequently tramp steamers cut the rates to obtain cargoes. In gen-

eral, Argentina, Australia, and the Pacific Coast rely mainly on tramp vessels, while the Atlantic Coast is served by liners supplemented by tramp vessels.

Both cargo and berth (or parcel) rates can be obtained relatively easily for the New York-Liverpool route, but it has been difficult to obtain satisfactory rates between Montreal and Liverpool. For these rates the International Institute of Agriculture appears to be as satisfactory a source as any, but too little summarized information is available concerning ocean freight rates on any but the most frequented routes to permit one to place complete reliance on the accuracy of these or any other quotations.

TABLE 5. — AVERAGE OCEAN FREIGHT RATES ON WHEAT FROM NEW YORK AND EASTERN CANADA TO LIVERPOOL, SUMMER AND WINTER SEASONS, 1921 TO 1925*

(U.S. cents per bushel)

Season	New York to Liverpool		Eastern Canada to Liverpool[a]
	Cargo rates	Berth rates	Cargo rates
1921 Summer[b]	11.4	11.8	12.8
1921–22 Winter[b]	8.7	8.5	11.2
1922 Summer	5.7	6.0	8.7
1922–23 Winter	6.0	6.1	10.1
1923 Summer	5.2	5.6	8.7
1923–24 Winter	8.5	8.6	10.2
1924 Summer	6.4	6.8	9.8
1924–25 Winter	6.8	6.9	9.4
1925 Summer	6.2	6.7	8.8
Average, 1922–25	6.3	6.6	9.5
Summer average	5.9	6.2	9.3
Winter average	7.1	7.2	9.9

* Cargo rates are data of International Institute of Agriculture, and berth rates are data of Cornish & Co., New York. Weekly cargo rates are given in Appendix Tables VI and VII.

[a] Presumably summer rates apply mainly to Montreal, winter to St. John.

[b] "Summer" is regarded in this case as May through November, "winter" as December through April.

According to the rates quoted by the International Institute of Agriculture, the average cost of moving wheat in cargoes from New York to Liverpool for the period 1922 to 1925 was 6¼ cents a bushel. Summer rates were slightly under this figure and winter rates about 1¼ cents higher than summer rates. Similar rates quoted by the same organization for Canadian ports to Liverpool averaged 9½ cents for the period as a whole, the summer rate averaging 9⅓ cents and the winter about 10 cents. This would indicate a difference of approximately 3¼ cents between New York and Canadian shipping points, more than offsetting the lower transportation charges between Fort William and Montreal. Berth rates from New York to Liverpool, compiled by Cornish & Co., averaged about ¼ cent higher than cargo rates during this period and showed less difference from winter to summer. Table 5 summarizes ocean freight rates from New York and Eastern Canada to Liverpool.

SUMMARY OF SHIPMENT COSTS

Assembling the material presented above in Tables 2, 3, 4, and 5, we find that the costs of shipment from Winnipeg to Liverpool during open navigation in the four seasons

TABLE 6.—COSTS OF SHIPPING WHEAT FROM FORT WILLIAM TO LIVERPOOL, OPEN NAVIGATION, 1921 TO 1925*

(U.S. cents per bushel)

VIA NEW YORK—WATER AND RAIL

Open navigation	Water and rail Fort William to New York	Handling charges	Ocean freight[a]	Total
1921	12.5	5.5	11.4	29.4
1922	12.1	5.5	5.7	23.3
1923	13.3	5.5	5.2	24.0
1924	11.2	5.5	6.4	23.1
1925	11.2	5.5	6.2	22.9

VIA MONTREAL—ALL WATER

Open navigation	All water Fort William to Montreal	Handling charges	Ocean freight[a]	Total
1921	9.7	4.8	12.8	27.3
1922	10.4	4.8	8.7	23.9
1923	10.5	4.8	8.7	24.0
1924	9.0	4.8	9.8	23.6
1925	8.9	4.8	8.8	22.5

VIA MONTREAL—WATER AND RAIL

Open navigation	Water and rail Fort William to Montreal	Handling charges	Ocean freight[a]	Total
1921	11.5	4.8	12.8	29.1
1922	11.9	4.8	8.7	25.4
1923	12.0	4.8	8.7	25.5
1924	11.3	4.8	9.8	25.9
1925	11.0	4.8	8.8	24.6

* Weekly costs by the first two routes are given in Appendix Table VIII.

[a] Cargo rates.

1922 to 1925 averaged a little under 25 cents. Costs on the all-water route via Montreal and by the New York route were a little lower, 22½ to 24 cents, while costs by the Montreal water-and-rail route were about 2 cents higher. Costs via Philadelphia and Baltimore were approximately the same as by the Montreal all-water route. Table 6 (page 189) presents figures for the principal routes.

Winter costs were in all cases somewhat higher than summer costs. Table 7 gives these figures for the principal routes. For this computation the lake rates included are those for November shipments to Buffalo, for wheat moving to American ports, and to Georgian Bay ports for wheat moving to St. John. Handling charges by routes involving both water and rail are larger than by all-rail routes because of storage and additional charges for interest and insurance.

Costs via Buffalo and New York averaged between 26 and 28 cents, via St. John between 29 and 32 cents. The route by rail to the seaboard is the most expensive of any, but again New York has the advantage over the Canadian port because of lower ocean freight rates. From 1921 to 1925 the New York all-rail rate averaged between 32 and 35 cents.

TABLE 7.—COSTS OF SHIPPING WHEAT FROM FORT WILLIAM TO LIVERPOOL, CLOSED NAVIGATION, 1921–25*

(U.S. cents per bushel)

VIA NEW YORK—WATER AND RAIL

Closed navigation	Water and rail Fort William to New York	Handling charges	Ocean freight[a]	Total
1921–22.....	11.6	7.0	8.7	27.3
1922–23.....	14.0	7.0	6.0	27.0
1923–24.....	12.7	7.0	8.5	28.2
1924–25.....	12.4	7.0	6.8	26.2

VIA ST. JOHN—WATER AND RAIL

Closed navigation	Water and rail Fort William to St. John	Handling charges	Ocean freight[a]	Total
1921–22.....	11.5	7.0	11.2	29.7
1922–23.....	14.6	7.0	10.1	31.7
1923–24.....	12.7	7.0	10.2	29.9
1924–25.....	12.9	7.0	9.4	29.3

VIA NEW YORK—ALL RAIL

Closed navigation	Rail Fort William to New York	Handling charges	Ocean freight[a]	Total
1921–22.....	21.0	5.0	8.7	34.7
1922–23.....	21.3	5.0	6.0	32.3
1923–24.....	21.3	5.0	8.5	34.8
1924–25.....	21.3	5.0	6.8	33.1

* Weekly costs by the first and third routes are given in Appendix Table IX. See also statements in accompanying text.

[a] Cargo rates.

V. COMPARISON OF PRICE SPREADS AND SHIPMENT COSTS

In Table 8, summer and winter average Winnipeg-Liverpool price spreads for No. 1 Manitoba wheat are compared with the costs of moving wheat from Winnipeg to Liverpool by representative routes noted above, while Charts 3 and 4 (pp. 191 and 192) present comparisons of spreads and costs, weekly for the past five years. The cost figures shown on Chart 3 are based on the all-water route via Montreal for the months of open navigation, and on the all-rail and water-and-rail routes via New York during the months when the lakes are closed. The two possible winter routes are shown because the all-rail route is the one on which calculations must be made in the winter trade between Winnipeg and Liverpool direct, while the water-and-rail route, with storage at eastern lake ports, provides most of the winter supply of Canadian wheat for Liverpool. Chart 4 shows the deviations of price spreads from shipment costs during the same period. In this case summer costs are based on the all-water rate via Montreal, and winter costs on the all-rail rate via New York.

A study of the table shows that during a portion of the past five years spreads covered the cheapest shipment costs, but that during the last three summer seasons, no matter what route is considered, costs exceeded price spreads. During these three summer seasons, price spreads averaged 20–23 cents, costs by the most frequented routes 22½–24 cents. Winter spreads during the same period averaged 27–29½ cents,

while costs were 26–28 cents if the wheat was stored at Buffalo, and 32–35 cents if it was shipped by rail.

The charts further emphasize the fact that between April 1921 and March 1923 price spreads were fairly consistently above costs except by the all-rail route, but that since that time costs have been above spreads more frequently than not. Since July 1924, the risks of trading have been further increased by the rapid fluctuations in the spreads.

TABLE 8.—COMPARISON OF SPREADS BETWEEN WINNIPEG AND LIVERPOOL PRICES OF NO. 1 MANITOBA WHEAT AND COSTS OF SHIPPING WHEAT FROM FORT WILLIAM TO LIVERPOOL, SUMMER AND WINTER, 1921–25

(U.S. cents per bushel)

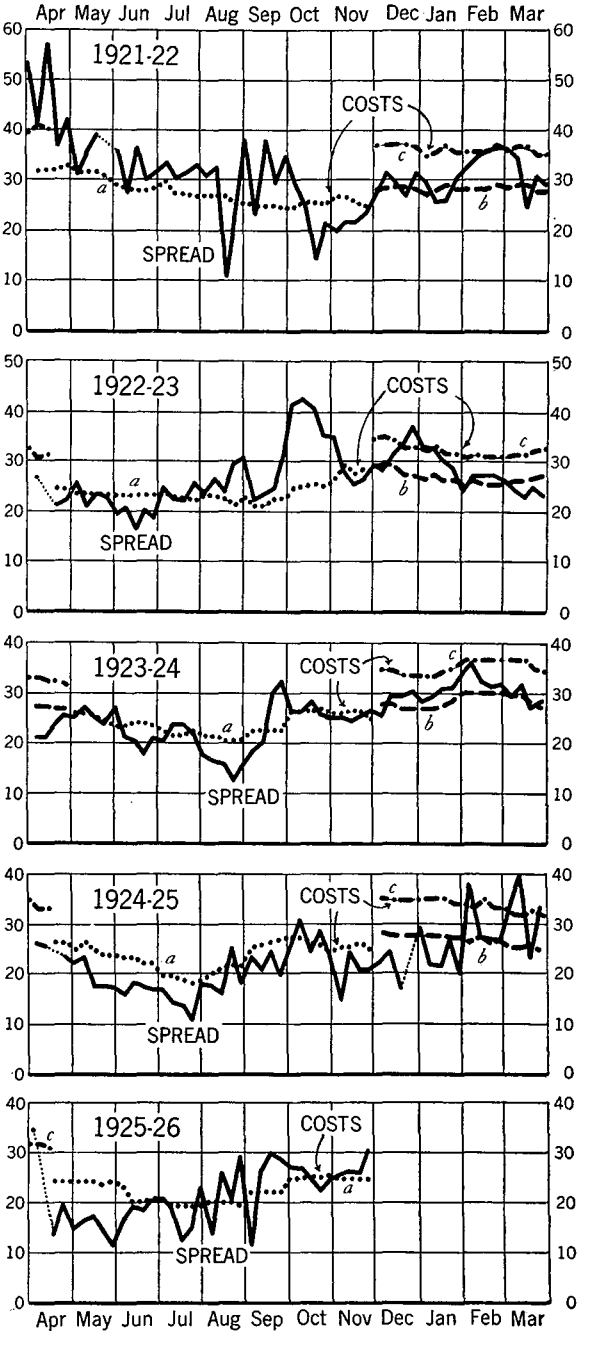
Summer	Price spread	Costs		
		Via New York water and rail	Via Montreal all water	Via Montreal water and rail
1921.....	30.5	29.4	27.3	29.1
1922.....	26.2	23.3	23.9	25.4
1923.....	22.9	24.0	24.0	25.5
1924.....	20.0	23.1	23.6	25.9
1925.....	20.9	22.9	22.5	24.6
Winter	**Price spread**	**Costs**		
		Via New York water and rail	Via St. John water and rail	Via New York all rail
1921-22..	30.7	27.3	29.7	34.7
1922-23..	28.5	27.0	31.7	32.3
1923-24..	30.5	28.2	29.9	34.8
1924-25..	26.9	26.2	29.3	33.1

If we examine the relationship of price spreads and shipment costs month by month during the year, we find several significant facts.

1. During the period from August to October the relation between spreads and costs is usually erratic. Exhaustion of available supplies of Canadian wheat in Liverpool during these months may lead to premium prices and abnormally large spreads; or similar exhaustion of supplies for domestic milling in Canada may occur when Liverpool still has an abundanace of Canadian wheat, either in stock or en route, in which case spreads will be abnormally narrow. So far as may be judged from the erratic figures, however, the average spread tends to equal costs of shipment during August and until the new crop reaches the Winnipeg market, when Win-

CHART 3. — WINNIPEG-LIVERPOOL PRICE SPREADS AND SHIPMENT COSTS, NO. 1 MANITOBA WHEAT, WEEKLY, APRIL 1921 TO NOVEMBER 1925*

(U.S. cents per bushel)



* For data, see Appendix Tables III, VIII, and IX.

[a] Costs via Montreal, all-water route.

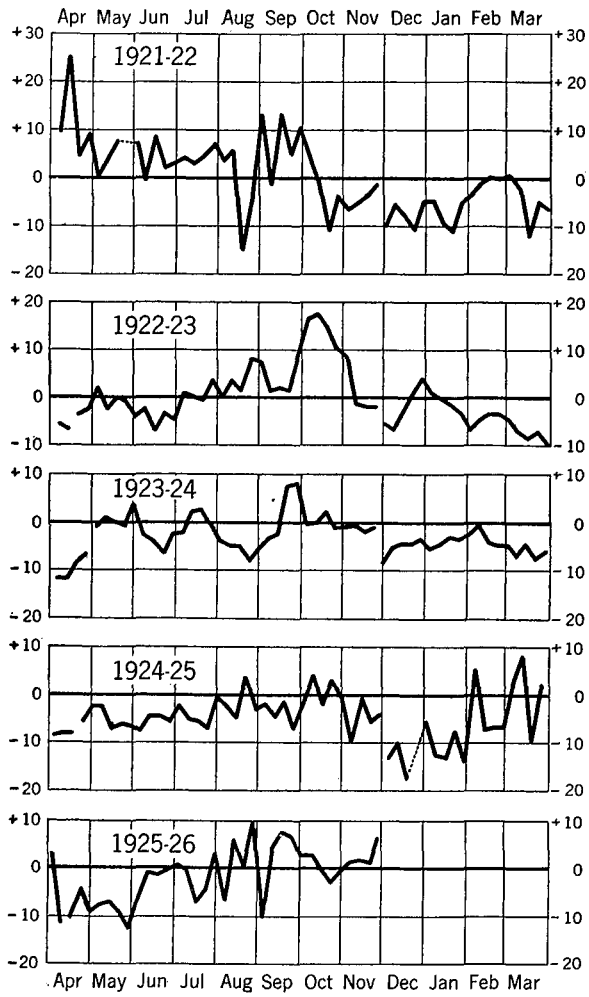
[b] Costs via New York, water-and-rail route to seaboard.

[c] Costs via New York, all-rail route to seaboard.

nipeg prices shift to the new crop basis and Liverpool remains for a time on the old crop basis, resulting in a wider spread.

CHART 4.—DEVIATIONS OF PRICE SPREADS FROM SHIPMENT COSTS, WINNIPEG-LIVERPOOL, No. 1 MANITOBA WHEAT, WEEKLY, APRIL 1921–NOVEMBER 1925*

(U.S. cents per bushel)



* Data computed from data in Appendix Tables III, VIII, and IX. During open navigation, deviations are from costs via Montreal, all-water route; during closed navigation, from costs via New York, all-rail route.

2. From the middle of October or early November to the middle of December, during the period of heavy movement of wheat, spreads and costs come into the closest relationship of the year, the spread apparently just equaling the cost in a normal year or possibly running slightly under the prevailing quoted costs in October and November. During this period ocean freight rates are at or near their peak, and large quantities of wheat are bought for movement to eastern points whence it can be shipped later at more favorable rates, if such develop, and with the probability of a more favorable Liverpool price than that obtaining at the time. In addition, eastern lake storage relieves storage at the head of the lakes and facilitates export sales to the United States.

3. The winter months, from the latter part of December to early April, are likewise characterized by an erratic relationship between spreads and costs, but for a different reason. With the lakes closed to navigation, the cost of direct shipment is so high that it is seldom covered by the spread, and the relationship is determined largely by the spread expected in the spring—the estimates of which may differ in the two markets—and by the adequacy of supplies, in Liverpool and en route, to cover needs before the opening of navigation. If a shortage of Canadian wheat develops in Liverpool the period of wide spreads may be extended into early May. The spread during these months averages considerably less than all-rail shipment costs, and shipments are seldom made direct from Fort William or Port Arthur.

4. From the opening of navigation on the lakes in April until about July the relationship between spreads and costs becomes fairly definite, maintained by the existence of a steady movement of wheat. During April and May and early June the spread is commonly less than the quoted costs at the time, owing to the fact that wheat is bought for shipment from Fort William or Port Arthur with the expectation that ocean freight rates will reach their usual lower levels by the time the wheat reaches the seaboard. By late June or July ocean freight rates approach their seasonal minimum and costs tend to equal the spread.

5. Even during the periods from late April to July and from mid-October to mid-December when the relationship between spreads and costs is most definite, peculiarities in spreads sometimes occur which can scarcely be accounted for by assuming

errors in the data and seem to reflect the influence of divergent views in the two markets as to probable future prices. The most significant of these peculiarities during the period under review occurred in October and November, 1921, November and December, 1924, May, June, and July, 1924, and April and May, 1925. Each of these cases was associated with rapidly changing prices, under which conditions wide divergences of opinion may develop as to the future course of prices.

VI. CONCLUSION

The foregoing study leads to the conclusion that in the Winnipeg-Liverpool trade there is a broad tendency for price spreads to correspond to shipment costs by the cheapest available route; also for price spreads to vary from season to season and from year to year in rough correspondence with shipment costs. In recent years, in seasons of open navigation, average costs have slightly exceeded average spreads. During closed navigation, costs by the all-rail route to the seaboard (the only one available at this season for direct shipments to Liverpool) have substantially exceeded price spreads, but costs incurred for shipment via Buffalo and New York on wheat stored for a time at Buffalo have been below price spreads. Moreover, within a season (open or closed navigation), price spreads vary not a little above and below calculable costs. It is only with such qualifications that our data support the orthodox theory of international price relationship. Certainly one cannot rigidly apply the doctrine that from day to day or week to week Winnipeg prices are fixed by Liverpool prices less shipment costs.

There is danger, however, in drawing certain inferences from these conclusions or the data studied. If our price and cost data are really representative of the export trade, they indicate that during the past three years wheat exporters could not have "broken even" on their operations unless they bought at lower or sold at higher prices than the average of the quotations, or obtained especially favorable lake or ocean freight rates. If it is assumed that the trade has operated at a profit, either the data are not really representative or the statistical material tells only part of the story.

It is true that not all of the trade is carried on at a profit. Not only are there good years and bad years for all traders, but there is a considerable turnover of members of the trade. As a British expert remarked of the Liverpool trade: "There is a constant rain of optimists pouring through this trade who enter with money and go out with none." The export trade is similarly unstable. Moreover, at times the choice of a large turnover at a slight loss may be better policy than a small turnover at a slight profit.

Undoubtedly the statistical material tells only a part of the story; it represents average conditions with no special emphasis on the unusually favorable situations which present the chief opportunities for profit in exporting. Certain deficiencies of the statistical data must be borne in mind. In the first place, the *closing* price on the Winnipeg Exchange (which served as the basis for this study) may be a cent or two above the *low*, or a cent or two under the *high*, quotation of the day. Secondly, the Liverpool *parcel afloat* price is usually a few cents under the *cargo afloat* price. Although the major portion of Canadian wheat is sold in parcel lots, a large volume is sold in cargoes and some is stored in Great Britain for sale in small quantities. Price spreads on the basis of Winnipeg *low* quotations or Liverpool *cargo* or *in store* quotations would obviously be several cents wider than on the basis of the quotations we have used. Similarly the cost figures we have used may not be strictly representative of conditions. As indicated above, ocean freight rates from Montreal to Liverpool and even from New York to Liverpool may vary considerably from quoted figures. Another weakness of our comparison is that the Liverpool prices are for wheat in parcels, while the ocean shipment rates are for wheat in cargoes. As

parcel rates are reported to be slightly lower than cargo rates between Montreal and Liverpool, this factor would partially account for the fact that spreads as we have calculated them have been lower than shipment costs during the past three summers.

Even if ideal quotations could be obtained, they would probably not be strictly representative of trade conditions. Through the operations of the Canadian pools, Winnipeg prices are probably decreasingly representative of those paid for wheat for export. It is believed in some circles that the selling prices of the pool follow or reflect the registered prices on the Winnipeg exchange less closely than do the prices of private grain dealers. Liverpool has apparently been an unsatisfactory market for a study of import prices for a number of years. Prices quoted there reflect, not the total shipments to Liverpool, but in large measure the wheat that is shipped unsold or is resold at a loss to someone. The wheat that goes there unsold usually cannot be disposed of elsewhere. Much of the wheat handled by Liverpool dealers does not pass through the Liverpool market, and the prices paid are not recorded there. Our analysis suggests that Liverpool price quotations are frequently below weighted average import prices.

In any consideration of the profitableness of the Canadian export trade, it must be remembered that considerable Canadian wheat is shipped direct to the Continent on continental orders. Prices of this wheat are not registered in the Liverpool quotations.

What is really significant for both exporter and importer is the actual spread between his sale price and his purchase price, and the relation of this spread to the costs he must cover in each transaction. The skilful dealer will frequently be able to get wider spreads and incur lower costs than averages indicate, but at certain seasons and for many dealers the reverse may be true. Statistical data based on average spreads and costs, and on a simultaneous comparison of these averages, are necessarily imperfect representations of actual trading experience.

The analysis here presented shows that, while the difference between average spreads and average costs is not large and may be accounted for by limitations of the data, wide deviations occur frequently and substantial deviations may persist over several weeks.

This issue has been written by Katharine Snodgrass with the counsel of Joseph S. Davis, Alonzo E. Taylor, and Holbrook Working, and the aid of Margaret Milliken and the statistical staff of the Institute

APPENDIX

TABLE I.—CASH PRICES OF NO. 1 MANITOBA WHEAT AT WINNIPEG, WEEKLY, 1921–25*

(U.S. dollars per bushel)

Month	1921	1922	1923	1924	1925	Month	1921	1922	1923	1924	1925
Jan.	1.71	1.06	1.06	.93	1.82	July	1.65	1.34	1.10	1.21	1.57
	1.74	1.08	1.08	.94	1.88		1.62	1.35	1.05	1.24	1.60
	1.66	1.10	1.08	.94	1.91		1.64	1.36	1.05	1.36	1.71
	1.68	1.11	1.07	.94	1.98		1.64	1.34	1.05	1.47	1.63
					2.14		1.64				1.57
Feb.	1.55	1.16	1.07	.96	1.90	Aug.	1.57	1.32	1.05	1.49	1.74
	1.71	1.22	1.09	.96	1.91		1.65	1.21	1.06	1.49	1.64
	1.64	1.30	1.11	.95	1.93		1.63	1.18	1.10	1.47	1.72
	1.68	1.40	1.09	.98	2.01		1.56	1.09	1.19	1.37	1.63
				.96					1.16	1.39	
Mar.	1.74	1.43	1.09	.97	1.89	Sept.	1.35	1.02	1.14	1.35	1.56
	1.69	1.35	1.09	.94	1.73		1.47	1.04	1.03	1.43	1.41
	1.63	1.38	1.11	.95	1.68		1.30	.99	.99	1.44	1.34
	1.66	1.35	1.12	.93	1.60		1.31	1.03	.97	1.52	1.26
		1.33	1.12				1.23	.97			
Apr.	1.58	1.33	1.15	.95	1.38	Oct.	1.05	.97	.98	1.57	1.19
	1.60	1.38	1.20	.96	1.58[a]		1.11	1.00	.98	1.62	1.24
	1.42	1.46	1.19	.97	1.59		1.05	1.02	.94	1.66	1.27
	1.64	1.44	1.20	.97	1.60		1.02	1.07	.96	1.55	1.28
	1.61									1.51	1.32
May	1.69	1.42	1.17	1.01	1.68	Nov.	.96	1.06	.97	1.67	1.35
	1.64	1.46	1.14	1.01	1.80		1.01	1.06	.96	1.67	1.38
	1.72	1.41	1.15	1.02	1.82		1.02	1.14	.95	1.64	1.44
	1.67	1.39	1.16	1.06	1.87		1.06	1.12	.95	1.65	1.54
				1.05	1.92				.92		
June	1.74	1.37	1.08	1.06	1.84	Dec.	1.09	1.10	.94	1.64	1.66
	1.73	1.32	1.13	1.09	1.75		1.05	1.07	.90	1.69	1.51
	1.64	1.30	1.16	1.16	1.67		1.03	1.08	.89	1.80	1.52
	1.68	1.33	1.14	1.18	1.66		1.08	1.10	.90	1.86	1.55[a]
		1.35	1.09				1.05	1.07			

* Official data of Winnipeg Grain Exchange as quoted by International Institute of Agriculture. Quotations are Friday closing prices—basis in store Fort William or Port Arthur.

[a] Thursday price.

TABLE II.—CASH PRICES OF NO. 1 MANITOBA WHEAT AT LIVERPOOL, WEEKLY, 1921–25*

(U.S. dollars per bushel)

Month	1921	1922	1923	1924	1925	Month	1921	1922	1923	1924	1925
Jan.	2.32	1.35	1.39	1.21	2.12	July	1.96	1.59	1.30	1.38	1.78
	2.38	1.34	1.41	1.24	2.10		1.95	1.58	1.28	1.38	1.78
	2.36	1.36	1.38	1.25	2.12		1.94	1.58	1.28	1.49	1.84
	2.29	1.42	1.36	1.26	2.24		1.96	1.60	1.27	1.58	1.78
					2.34		1.97				1.80
Feb.	2.10	1.49	1.31	1.30	2.28	Aug.	1.88	1.55	1.22	1.67	1.88
	2.13	1.57	1.36	1.32	2.18		1.97	1.48	1.23	1.66	1.90
	2.18	1.66	1.38	1.28	2.20		1.75	1.41	1.25	1.63	1.92
	2.18	1.76	1.36	1.29	2.28		1.79	1.38	1.32	1.62	1.92
				1.28					1.31	1.57	
Mar.	2.13	1.80	1.35	1.26	2.24	Sept.	1.73	1.32	1.32	1.59	1.68
	2.14	1.69	1.33	1.26	2.12		1.70	1.26	1.33	1.64	1.67
	2.14	1.62	1.34	1.22	1.91		1.68	1.22	1.29	1.69	1.64
	2.14	1.65	1.37	1.22	1.94		1.60	1.28	1.29	1.72	1.55
		1.61	1.36				1.57	1.29			
Apr.	2.12	1.60	1.36	1.21	1.73	Oct.	1.34	1.38	1.25	1.81	1.46
	2.02	....	1.41	1.21	1.78[a]		1.35	1.42	1.24	1.92	1.50
	1.99	1.67	1.43	....	1.73		1.20	1.42	1.22	1.91	1.51
	2.00	1.66	1.45	1.21	1.79		1.23	1.42	1.22	1.83	1.51
	2.03									1.75	1.56
May	2.00	1.67	1.42	1.23	1.83	Nov.	1.16	1.41	1.22	1.82	1.61
	2.00	1.67	1.41	1.24	1.96		1.23	1.35	1.21	1.91	1.64
	2.11	1.65	1.40	1.19	1.99		1.24	1.40	1.20	1.84	1.70
	....	1.62	1.40	1.23	2.01		1.30	1.38	1.21	1.85	1.85
				1.22	2.04				1.18		
June	2.10	1.57	1.35	1.21	2.00	Dec.	1.36	1.39	1.19	1.86	1.93
	2.00	1.52	1.34	1.27	1.94		1.36	1.36	1.19	1.93	1.91
	2.00	1.47	1.36	1.33	1.85		1.33	1.40	1.19	1.97	1.84
	1.98	1.53	1.32	1.35	1.86		1.35	1.44	1.20	....	1.85[a]
		1.53	1.30				1.37	1.44			

* Data of International Institute of Agriculture. Prices are Friday c.i.f. quotations for parcels.
[a] Thursday price.

TABLE III.—SPREAD BETWEEN CASH PRICES OF NO. 1 MANITOBA WHEAT AT WINNIPEG AND AT LIVERPOOL, WEEKLY, 1921–25*

(U.S. cents per bushel)

Month	1921	1922	1923	1924	1925	Month	1921	1922	1923	1924	1925
Jan.	61.3	29.6	33.0	28.4	29.2	July	31.2	24.6	20.2	16.8	20.8
	63.8	25.9	32.7	29.4	21.9		33.3	22.7	23.7	14.4	19.0
	70.6	26.0	30.2	31.0	21.3		30.1	22.2	23.8	13.3	12.4
	61.0	30.3	28.7	31.4	26.4		31.5	25.7	21.8	11.1	14.9
					19.9		32.9				22.8
Feb.	54.8	32.4	24.4	34.1	37.9	Aug.	30.6	23.6	17.6	18.0	13.8
	41.9	34.7	27.1	36.0	27.3		32.5	26.5	16.3	17.7	25.8
	54.0	35.9	27.2	32.4	26.7		11.7	23.8	15.8	16.1	20.4
	49.9	36.4	27.3	31.7	26.4		22.3	29.4	12.6	24.9	29.1
				32.0					15.0	18.2	
Mar.	39.5	36.3	26.1	29.5	34.4	Sept.	38.2	30.5	18.7	23.3	11.8
	44.9	34.3	24.3	31.9	39.7		23.4	22.5	20.1	20.9	26.0
	51.7	24.7	23.0	27.4	23.0		37.6	23.4	30.1	24.4	29.5
	48.1	30.3	25.1	28.5	33.7		29.6	24.5	32.6	19.8	28.7
		28.8	23.5				34.6	31.6			
Apr.	53.6	26.8	21.1	26.1	34.4	Oct.	29.2	41.6	26.4	24.6	27.1
	41.4	....	21.0	25.3	19.8[a]		24.7	42.3	26.2	30.7	26.9
	56.7	21.0	23.8	....	13.7		14.3	40.8	28.3	24.4	24.8
	36.7	22.1	25.5	23.5	19.6		21.2	35.5	26.0	28.4	22.4
	41.9									23.8	24.2
May	31.3	25.5	24.9	22.1	14.9	Nov.	19.9	35.1	25.2	14.8	25.3
	35.5	20.9	26.8	23.3	16.3		21.7	28.1	25.2	24.1	25.9
	38.8	23.4	25.3	17.5	17.2		21.7	25.8	24.4	20.4	25.6
	....	22.8	23.9	17.5	14.3		23.5	26.5	25.5	20.6	30.3
				17.2	11.5				26.6		
June	35.9	19.5	27.0	15.8	16.3	Dec.	26.8	29.2	25.8	22.2	27.5
	27.5	20.6	21.1	18.2	19.0		31.5	28.2	29.4	24.1	40.0
	36.4	16.4	20.3	17.3	18.2		29.8	31.5	29.4	17.0	31.9
	29.8	20.0	17.9	16.8	20.2		26.9	33.7	30.1	....	29.6[a]
		18.6	20.9				31.6	37.0			

* Computed from data in Appendix Tables I and II.
[a] Based on Thursday prices.

TABLE IV.—MONTHLY AVERAGE LAKE FREIGHT RATES ON WHEAT FROM FORT WILLIAM AND PORT ARTHUR, DURING OPEN NAVIGATION, 1921–25*

(U.S. cents per bushel)

Month	To Buffalo					To Georgian Bay ports					To Montreal				
	1921	1922	1923	1924	1925	1921	1922	1923	1924	1925	1921	1922	1923	1924	1925
Apr.	2.02	2.26	....	2.84	2.64	2.39	2.92	....	3.36	2.66	11.25	9.45	....	11.49	10.35
May	1.57	2.14	5.18	2.10	1.74	2.05	2.40	4.02	2.61	1.85	10.50	9.38	11.85	9.41	10.06
June	1.55	2.00	4.75	1.60	1.58	2.00	2.43	3.62	2.22	1.83	9.04	9.64	10.02	9.18	9.07
July	1.57	2.26	3.55	1.60	1.75	1.99	2.51	2.79	2.49	1.84	8.82	9.64	9.08	6.47	6.53
Aug.	1.65	2.72	3.13	1.47	1.75	2.02	3.84	2.92	2.44	1.95	8.98	10.37	8.84	6.80	7.13
Sept.	1.83	2.84	4.47	1.95	2.17	2.67	3.00	3.46	2.19	2.54	8.99	9.76	10.52	10.05	8.86
Oct.	1.87	4.49	5.16	2.26	2.36	2.75	3.88	4.46	2.91	3.44	10.05	11.94	12.43	10.22	10.59
Nov.	2.53	4.87	3.57	3.29	3.15	2.82	5.65	3.80	3.83	2.84	10.07	12.63	10.80	9.57	9.16
Dec.	4.51	5.86	4.68	5.35	4.40	4.26	6.22	4.61	5.39	4.40	....	....	....	....	....

* Compiled from *Report on the Grain Trade of Canada, 1924*, p. 158, and from manuscript table furnished by Canadian Dominion Bureau of Statistics. Data converted on basis of monthly average exchange rates.

TABLE V.—CHANGES IN RAILWAY RATES ON WHEAT FOR EXPORT FROM LAKE PORTS TO EASTERN PORTS, 1921–25*

(Canadian cents per bushel)

Date	Fort William and Port Arthur to				Date	Georgian Bay Ports to			Buffalo to New York[a]
	Montreal	St. John	Halifax	New York		Montreal	St. John	Halifax	
1920 May 17	18.0	20.4	20.4	20.4	1920 Aug. 27	....	13.3	13.9	....
Aug. 27	....	27.3	27.3	....	Sept. 1	....	....	....	12.1
Sept. 13	25.2	....	....	....	Sept. 4	10.6	12.1	12.7	....
Dec. 6	....	28.8	28.8	....	Sept. 13	11.8	....	....	....
1921 Apr. 11	24.3	....	....	....	1921 Apr. 15	11.6	....	....	....
May 12	....	27.0	27.0	....	Aug. 9	8.6	9.1	9.7	9.1
Sept. 23	21.9	....	....	22.5	1923 Oct. 3	....	....	9.1	....
Sept. 27	....	22.5	22.5	....					
1922 Jan. 1	....	21.3	21.3	21.3					
Apr. 20	20.7	....	....	....					

* Data from *Reports on the Grain Trade of Canada*, especially 1923, p. 165, and 1924, pp. 149, 150, 152, and 153; *Annual Reports of Trade and Commerce*, of Chicago Board of Trade.
[a] U.S. cents per bushel.

TABLE VI.—OCEAN FREIGHT RATES ON WHEAT FROM NEW YORK TO LIVERPOOL, WEEKLY, 1921–25*

(U.S. cents per bushel)

Month	1921	1922	1923	1924	1925	Month	1921	1922	1923	1924	1925
Jan.	15.9	8.5	5.8	7.4	8.2	July	11.6	5.6	4.3	4.1	4.6
	16.4	9.2	6.6	7.4	8.2		11.6	5.6	4.3	4.1	4.6
	14.2	10.5	5.3	8.0	8.2		11.3	5.6	4.3	4.1	4.6
	14.5	9.2	5.3	8.8	7.5		11.2	7.0	4.3	4.1	4.6
					7.5		11.2				4.6
Feb.	10.8	9.4	4.6	10.1	6.7	Aug.	11.2	5.6	4.3	4.1	4.6
	11.6	9.5	5.1	10.1	8.2		11.4	5.6	4.3	4.2	4.6
	12.2	9.5	4.4	10.1	6.7		11.4	6.3	4.3	4.3	5.3
	12.1	10.3	4.4	10.1	6.7		11.5	5.6	4.3	4.9	5.3
				10.1					4.3	5.6	
Mar.	12.2	9.7	4.4	10.0	5.5	Sept.	11.6	4.9	4.2	4.9	5.3
	14.6	10.2	5.2	10.0	5.5		11.1	4.9	4.3	5.6	6.8
	14.7	10.2	5.1	8.7	6.0		11.0	4.2	5.0	5.6	7.6
	13.5	8.9	5.9	8.1	5.2		10.5	4.2	5.0	9.1	7.6
		8.9	6.6				9.3	3.4			
Apr.	14.2	6.2	6.6	8.1	5.2	Oct.	9.5	4.8	5.0	8.4	9.1
	15.3	4.1	6.6	6.8	5.2		9.6	4.8	6.4	8.4	9.1
	14.7	4.8	5.8	6.8	4.5		9.9	4.9	5.7	9.1	9.1
	14.7	4.8	5.8	6.8	4.5		9.8	4.9	7.0	9.1	9.1
	15.4									7.8	9.1
May	15.6	5.6	5.1	6.8	4.5	Nov.	9.2	8.4	7.7	8.6	9.1
	15.6	5.6	5.0	6.8	4.6		9.2	8.4	8.3	8.7	9.1
	16.3	5.6	5.1	6.8	4.6		9.4	8.4	8.1	8.7	9.1
	16.0	5.6	4.3	6.8	4.6		9.4	8.4	8.2	8.7	9.1
				6.8	4.6				8.1		
June	12.2	5.6	4.3	6.7	4.6	Dec.	9.5	8.5	8.2	8.8	9.8
	11.6	5.6	4.3	5.2	4.6		9.6	8.6	8.4	8.0	10.6
	11.9	5.6	4.3	4.9	4.6		9.8	8.0	7.5	8.1	10.6
	11.7	5.5	4.6	4.1	4.6		9.8	6.5	7.5	8.1	10.6
		4.8	3.8				9.2	6.5			

* Data of International Institute of Agriculture. Rates are cargo rates for Friday of each week.

TABLE VII.—OCEAN FREIGHT RATES ON WHEAT FROM EASTERN CANADIAN PORTS TO UNITED KINGDOM, WEEKLY, 1921–25*

(U.S. cents per bushel)

Month	1921	1922	1923	1924	1925	Month	1921	1922	1923	1924	1925
Jan.	16.2	10.5	10.9	9.0	9.6	July	14.6	9.0	8.6	8.1	9.1
	16.6	11.2	10.2	8.9	9.7		16.0	8.3	7.9	8.2	8.4
	16.0	11.9	9.5	9.3	9.7		13.6	8.3	7.7	7.5	8.4
	15.7	10.6	9.4	9.9	9.0		13.5	7.9	8.6	6.9	8.3
					9.0		13.0				8.4
Feb.	10.8	12.1	9.5	10.8	9.7	Aug.	13.2	8.4	7.8	6.9	8.4
	11.3	11.6	9.5	10.8	11.2		13.2	7.9	7.8	8.5	8.4
	11.2	12.9	9.5	11.4	9.7		12.9	7.2	7.1	9.2	8.4
	11.5	13.8	9.6	11.4	9.7		11.5	6.5	7.1	9.8	7.6
				11.4					7.1	9.8	
Mar.	12.0	11.1	8.8	11.2	8.9	Sept.	11.6	8.4	7.1	10.4	8.3
	14.6	11.6	8.8	11.2	9.0		11.1	6.5	7.1	10.5	8.6
	14.7	11.6	8.8	10.8	9.0		11.0	6.7	7.1	11.2	8.6
	13.5	11.0	9.5	10.8	9.0		11.0	8.3	9.2	11.9	8.6
		10.9	10.2				10.5	8.2			
Apr.	15.9	11.0	10.2	10.8	9.0	Oct.	10.0	8.3	9.5	11.8	9.1
	15.8	10.4	10.2	10.8	9.0		10.9	8.3	9.2	11.9	9.1
	15.9	10.4	10.2	9.5	9.0		10.5	9.1	9.2	11.2	9.8
	16.1	10.4	10.1	9.6	9.0		10.4	8.3	9.8	10.5	9.8
	16.7									9.2	10.1
May	16.2	9.5	9.4	10.3	9.1	Nov.	11.7	9.1	10.5	10.7	10.6
	16.3	9.5	9.4	11.6	9.1		11.7	12.1	10.3	10.9	10.6
	16.2	9.5	8.7	10.2	9.4		10.6	10.5	10.8	11.6	10.6
	15.0	9.5	8.0	9.5	8.6		10.0	11.2	10.9	10.1	10.6
				9.4	9.1				9.5		
June	14.9	9.1	8.7	9.4	9.1	Dec.	10.8	11.3	9.6	10.2	10.6
	14.4	8.9	8.7	9.0	6.1		10.4	11.4	9.6	9.5	10.6
	14.2	9.0	9.4	8.1	6.1		10.4	11.6	8.8	9.6	9.8
	13.9	9.0	9.4	8.1	6.8		10.5	11.6	8.8	9.6	9.8
		8.9	8.6				10.5	11.9			

* Data of International Institute of Agriculture. Rates are cargo rates for Friday of each week.

TABLE VIII.—TOTAL COSTS OF SHIPPING WHEAT FROM FORT WILLIAM AND PORT ARTHUR TO LIVERPOOL, WEEKLY, DURING OPEN NAVIGATION, 1921–25*

(U.S. cents per bushel)

Month	Via Montreal all-water route					Via New York water-and-rail route				
	1921	1922	1923	1924	1925	1921	1922	1923	1924	1925
Apr.	....	....	....	....	....	....	....	....	....	....
	31.8	....	....	....	....	35.0	....	....	....	....
	31.9	24.6	....	25.8	24.1	34.3	21.7	....	24.2	21.7
	32.0	24.6	....	25.8	24.1	34.4	21.7	....	24.3	21.8
	32.7					35.1				
May	31.4	23.6	26.0	24.4	23.9	34.8	22.3	24.8	23.6	20.9
	31.5	23.6	26.0	25.8	23.9	34.8	22.3	24.8	23.5	20.9
	31.5	23.6	25.3	24.4	24.2	35.4	22.3	24.8	23.5	20.9
	30.2	23.6	24.6	23.7	23.4	35.2	22.3	24.1	23.5	20.9
				23.6	23.9				23.4	20.9
June	28.7	23.5	23.4	23.4	22.9	31.3	22.2	23.7	22.9	20.7
	28.2	23.3	23.4	22.9	19.9	30.8	22.2	23.7	21.4	20.7
	28.0	23.4	24.1	22.0	19.9	31.0	22.2	23.7	21.1	20.7
	27.7	23.4	24.2	22.0	20.7	30.9	22.1	23.9	20.3	20.7
		23.3	23.4				21.4	23.2		
July	28.2	23.4	22.4	19.3	20.4	30.8	22.4	22.4	20.3	20.9
	29.5	22.7	21.7	19.4	19.6	30.8	22.4	22.4	20.3	20.9
	27.2	22.7	21.5	18.2	19.6	30.5	22.4	22.5	20.3	20.9
	27.1	22.3	22.4	18.1	19.6	30.4	23.8	22.4	20.3	20.9
	26.6				19.6	30.4				20.9
Aug.	26.9	23.5	21.4	18.4	20.2	30.5	22.9	22.0	20.2	20.9
	26.9	23.0	21.4	20.0	20.2	27.7	22.9	22.0	20.3	20.9
	26.6	22.3	20.7	20.8	20.2	27.7	23.6	22.0	20.3	21.7
	25.3	21.6	20.7	21.4	19.5	27.8	22.9	22.0	21.0	21.7
			20.7	21.4				22.0	21.7	
Sept.	25.3	22.9	22.3	25.2	21.9	28.0	22.3	23.3	21.4	22.1
	24.8	21.0	22.4	25.3	22.2	27.5	22.3	23.3	22.2	23.6
	24.8	21.2	22.4	26.0	22.2	27.4	21.6	24.0	22.1	24.3
	24.8	22.8	24.5	26.7	22.2	26.9	21.6	24.0	25.6	24.3
	24.2	22.7				25.7	20.9			
Oct.	24.8	25.0	26.7	26.8	24.4	25.9	23.9	24.8	25.2	26.0
	25.7	25.0	26.4	26.9	24.4	26.1	23.9	26.2	25.3	26.0
	25.3	25.8	26.4	26.2	25.2	26.3	24.0	25.4	26.0	26.0
	25.2	25.0	27.0	25.5	25.2	26.3	24.0	26.8	26.0	26.0
				24.2	25.4				24.6	26.0
Nov.	26.5	26.4	26.0	25.0	24.5	26.4	27.8	25.8	26.5	26.8
	26.5	29.4	25.9	25.2	24.5	26.4	27.8	26.4	26.6	26.8
	25.4	27.9	26.4	25.9	24.5	26.5	27.9	26.3	26.6	26.8
	24.8	28.6	26.5	24.5	24.5	26.5	27.9	26.4	26.6	26.8
			25.0					26.3		
Dec.	....	....	....	....	....	28.6	28.9	27.5	28.7	28.8
	....	....	....	....	....	28.7	29.0	27.7	28.0	29.6
	....	....	....	....	....	28.9	28.4	26.8	....	....
	....	....	....	....	....	....	....	....	....	....
	....	....				....	....			

* Costs via Montreal computed by addition of (*a*) monthly lake rates to Montreal, (*b*) 4.75 cents handling charges, and (*c*) weekly ocean rates from Eastern Canada to United Kingdom. Costs via New York computed by addition of (*a*) monthly lake rates to Buffalo, (*b*) rail rate from Buffalo to New York, (*c*) 5.5 cents handling charges, and (*d*) weekly ocean rates from New York to Liverpool.

TABLE IX.—TOTAL COSTS OF SHIPPING WHEAT FROM FORT WILLIAM AND PORT ARTHUR TO LIVERPOOL, WEEKLY, DURING CLOSED NAVIGATION, 1921–25*

(U.S. cents per bushel)

Month	Via New York water-and-rail route				Via New York all-rail route			
	1921–22	1922–23	1923–24	1924–25	1921–22	1922–23	1923–24	1924–25
Dec.	....	....	....	....	37.0	34.8	34.5	35.1
	....	....	....	27.4	37.1	34.9	34.7	34.4
	....	....	....	27.5	37.3	34.3	33.8	34.4
	28.4	27.5	27.1	27.5	37.3	32.8	33.8	34.4
	27.8	27.5			36.7	32.8		
Jan.	27.2	26.8	27.1	27.6	34.8	32.1	33.7	34.5
	27.9	27.6	27.0	27.6	35.6	32.9	33.7	34.5
	29.2	26.3	27.6	27.6	36.8	31.6	34.2	34.5
	27.9	26.3	28.5	26.9	35.6	31.6	35.1	33.8
				26.9				33.8
Feb.	28.0	25.6	29.8	26.1	35.7	30.9	36.4	33.0
	28.2	26.1	29.8	27.6	35.8	31.4	36.4	34.5
	28.2	25.4	29.8	26.1	35.8	30.7	36.4	33.0
	29.0	25.4	29.8	26.1	36.6	30.7	36.4	33.0
			29.8				36.4	
Mar.	28.3	25.4	29.7	24.8	36.0	30.7	36.3	31.8
	28.8	26.1	29.7	24.9	36.5	31.4	36.3	31.8
	28.8	26.1	28.4	25.4	36.5	31.4	35.0	32.3
	27.5	26.8	27.7	24.6	35.2	32.2	34.4	31.5
	27.5	27.6			35.2	32.9		
Apr.	24.8	27.5	27.7	24.6	32.5	32.9	34.4	31.5
	22.8	27.5	26.4	23.9	30.4	32.8	33.1	31.5
	....	26.8	....	....	....	32.1	33.1	30.8
	....	26.8	....		....	32.1	....	....

* Costs via water-and-rail route computed by addition of (*a*) November lake rate to Buffalo, (*b*) 9.1 cents rail rate from Buffalo to New York, (*c*) 7 cents handling charges, and (*d*) weekly ocean rates from New York to Liverpool. Costs via all-rail route computed by addition of (*a*) rail rate to New York on monthly basis, converted by monthly average exchange rates, (*b*) 5 cents handling charges, and (*c*) weekly ocean rates from New York to Liverpool.

TABLE X.—FOREIGN EXCHANGE RATES FOR CANADIAN MONEY IN NEW YORK, WEEKLY, 1921–25*

(U.S. cents per Canadian dollar)

Month	1921	1922	1923	1924	1925	Month	1921	1922	1923	1924	1925
Jan.....	86.50	94.41	99.33	97.47	99.64	July.....	87.73	98.85	97.53	98.98[a]	100.00
	87.50	94.56	99.16	97.35	99.66		87.94	98.94	97.39	99.13	100.01
	88.12	94.70	98.90	97.73	99.59		87.52	99.03	97.41	99.20	100.01
	89.75	95.28	99.00	97.34	99.70		88.79	99.23	97.48	99.29	100.04
					99.96		88.91				100.07
Feb.....	88.88	95.59	98.89	97.07	99.82	Aug.....	89.12	99.64	97.59	99.71	100.02
	88.25	95.63	98.85	97.05	99.87		89.98	99.66	97.65[a]	99.72	100.03
	86.62	96.20	98.82	97.00	99.89		89.83	99.80	97.70	99.85	100.04
	87.75	97.38	98.38	96.87[a]	99.88		90.10	99.84	97.69	99.93	100.03
				96.58					97.62	99.99	
Mar.....	87.75	97.77	98.26	96.62	99.85	Sept.....	90.06	99.93	97.53	99.99	100.01
	87.56	96.56	98.15	96.64	99.88		89.52	99.82	97.63	99.85	99.92
	87.50	96.48	97.64	97.10	99.88		89.12	99.93	97.62	99.97	99.99
	88.00	97.31	97.74	97.59	99.88		89.92	99.98	97.85	99.98	99.99
		97.16	98.24				90.92	99.99			
Apr.....	88.81	97.33	98.13	97.87	99.91	Oct.....	90.90	100.01	98.62	99.96	100.00
	89.25	97.59	97.87	98.09	99.92		91.45	100.08	98.52[a]	99.96	100.05
	88.35	97.87	98.00	97.89	99.94		91.43	100.12	98.73	99.97	100.11
	89.12	98.36	98.00	98.20	99.98		92.02	100.11	98.36	99.98	100.14
	89.38									99.99	100.14
May.....	90.12	98.35	98.01	98.42	100.00	Nov.....	92.16	100.00	98.39	99.97	99.98
	89.38	98.68	98.07	98.21	100.00		91.40[a]	100.10	98.33	99.97	100.07
	89.50	99.02	97.95	98.21	99.99		91.39	100.05	98.18	100.00	100.08
	89.31[a]	99.02	97.80	98.25	99.99		91.27	99.99	97.88	100.01	100.14
				98.28	100.00				97.86		
June.....	89.00	99.03	97.51	98.37	100.00	Dec.....	91.55	99.95	97.91	99.92	100.01
	89.38	99.08	97.80	98.22	100.00		91.73	99.95	97.43	99.47	99.94
	88.92	99.13	97.60	98.32	100.00		92.41	99.61	97.46	99.50	99.96
	87.52	98.73	97.52	98.80	100.00		93.41	99.16	97.53	99.61	99.89[a]
		98.15	97.56				94.66	98.56			

* Data compiled from *Serial 8, Foreign Exchange Quotations and Curves*, Commission of Gold and Silver Inquiry, United States Senate, Washington, 1924; and from New York *Journal of Commerce*. Rates are noon-buying rates for cables on Fridays.

[a] Mean of rates for preceding and following days.

TABLE XI.—GROSS EXPORTS OF WHEAT (GRAIN) FROM CANADA, MONTHLY, 1921–25*

(Thousand bushels)

Crop year Aug.-July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Year
1921–22....	3,972	7,145	21,131	29,254	34,492	6,103	5,602	6,042	1,740	14,207	11,760	9,487	150,935
1922–23....	11,587	9,233	37,593	55,316	40,669	9,740	7,129	6,614	5,143	11,932	22,229	12,665	229,850
1923–24....	11,419	5,300	29,071	64,197	57,378	12,322	11,770	13,446	6,085	41,228	24,075	16,135	292,426
1924–25....	8,184	10,268	14,288	26,982	29,847	6,103	4,146	4,423	4,953	14,883	9,784	13,097	146,958
Average....	8,790	7,986	25,521	43,937	40,596	8,567	7,162	7,631	4,480	20,562	16,962	12,846	205,042

* Data from official Canadian sources.

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