A STUDY OF PRICE DIFFERENTIALS BETWEEN SELECTED CANADIAN AND UNITED STATES PUBLIC LIVESTOCK MARKETS

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In economic theory of the perfect market there is no justification for price differentials for a homogeneous commodity to be greater than the cost of transportation between two spatially separated markets, nor is there any justification for price differentials over time for any commodity to be greater than the cost of storage. In both instances the difference in price should only be enough to make allowance for transportation charges in the spatially separated market and for storage to keep a product over time. Whenever the difference is greater than the cost of moving a commodity from one market to another, the commodity remaining homogeneous, the two markets are not functioning as a perfect market. Similarily when the price difference is greater than the cost of storing a commodity from time X to time Y the market is not functioning as a perfect market with respect to time.

The first part of the study outlines the class and grade of livestock, the time periods, and the markets studied.

The second part outlines the conditions of the perfect market. In this part the perfect market is analyzed with respect to time and place.

The third chapter presents a price description of the Canadian and United States livestock market. It shows graphically the absolute price difference using several market prices as base. It also shows mathematical calculations that indicate how closely the prices were correlated between

markets. A reorganization of marketing has occurred on the national livestock markets. The changed marketing pattern is also shown in the third chapter.

The fourth chapter of the study presents several factors that are responsible for the changing of the established price pattern. In the pre-war period prices of livestock sloped downward from east to west. In the post-war period prices on the eastern markets were still highest, but prices on the other western markets are now higher than at Winnipeg.

Several factors that impinge on demand, such as population growth, income, income distribution and taste were examined. Also the supply of livestock marketings were compared to consumption. Several other factors; such as freight rate structure and location of packing plants were examined.

It was found that meat consumption in the western provinces of Canada relative to consumption in the eastern provinces of Canada had increased. The supply of livestock in eastern Canada has grown relatively more than in western Canada. The freight rate structure was of such a nature as to favor processing livestock in the western provinces and shipping the processed product. It was found that in the post-war period, the two western provinces of Canada process a greater proportion of total processed meat than in the pre-war period.

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CHAPTER I

INTRODUCTION

The livestock market, in both Canada and United States, is constantly changing. There appear to be three distinct changes in both Canada and the United States. At one time only the local market existed. The farmer would bring his livestock to the market and deal with the consumer directly. At this type of market set-up the buyer and seller actually bargained about a particular commodity. At these markets it is conceivable that prices throughout the market were far from uniform. The non-uniformity of prices on the market area was the result of each buyer and seller bargaining about a particular commodity. Neither the buyer nor the seller had full knowledge of supply and demand and the resulting price for the market area.

The second stage of development in the marketing of livestock, in Canada and the United States, was one in which livestock was brought to the local concentration points and shipped to the larger terminal markets. In this type of market set-up the farmer had little choice but to send his livestock to the local concentration point, have them shipped to the terminal market, and accept the price established at that market. This type of market set-up had the effect of permitting the terminal market to determine price. The smaller or local markets would follow the prices established at the terminal market. In Canada, as in the United States, the price surface for livestock has sloped downward from east to west. This, again, had the tendency for the eastern terminal markets to set the price and the western markets to follow the set price.

After World War I, especially during the 1920's, the marketing pattern in the two countries changed again. This time there developed a large group of small processing points away from the central market, right in the producing area. In most economic literature this market set-up is described as a decentralized market.

Technical innovations, such as the improvement of the motor truck, the concrete highway and radio, brought about the decentralization of livestock marketing. The truck assured quick delivery while the concrete highway allowed delivery in adverse weather and the radio informed producers about market conditions at the various markets.

With every change in the method of marketing a reorganization of market facilities takes place. In the decentralized market the farmers began delivering their livestock direct to the packing plant. Instead of assigning the livestock to commission agents the farmer delivered his own livestock. Because of the decentralized market system the price making forces that existed in the central market were changed.

Special mention must be made of the price making forces at work in the decentralized market. In the central marketing system the large market has the tendency to establish the price. However, in the decentralized marketing system it is quite possible that many of the smaller processing points determine their own price. Price at these points could conceivably be below or above those at the large markets. In the decentralized market the farmer directs his livestock to that point with the highest price. There may, however, be periods during a year in which this is not possible. Weather conditions may prevent delivery of livestock to the most desirable points price-wise. Hence when the livestock is delivered to those points that are accessible a surplus will occur thus lowering price; meanwhile points that are temporarily innaccessible will develop a deficit thus raising price.

Objective of the Study

The objective of any scientific study is to increase the available knowledge about a particular subject. In marketing as in any other study the knowledge obtained when applied, will make a market function more efficiently. The broad objective of the study is to determine the working of the livestock market as compared to the perfect market standard.

The first objective is to determine the price relationship that exists between the selected markets. The second objective is to determine the changing marketing pattern. The third and final objective is to determine the factors responsible for the increased price in the post-war period on the western markets as compared to Winnipeg.

Importance of the Study

Since the advent of commercial agriculture the farmer is not primarily a production man, but also a business man. In production he is concerned mainly with the combination of the various factors of production to produce a maximum quantity. The maximum quantity, however, need not necessarily produce maximum revenue. Therefore, it is imperative that the producer, after having produced his commodity, direct it toward a market from which he will derive the most income. The importance of a study of price differentials with respect to place is recognized by Shepherd; spatial hog price problems have been well analyzed in several publications.[1]

The importance of a study of price differentials with respect to place has been intensified since the advent of the decentralized market. Prior to the decentralized livestock markets the producers had little choice of markets in the sale of their livestock. That is, the producer was especially restricted in his choice of market place. Now however, with many markets throughout the producing area the farmer has a wide choice of markets to which he may direct his livestock. In this manner he is able to take advantage of a higher price at a particular market and help to narrow the price differential between the various markets. This narrowing of the price differential brings the actual market closer to the model of the perfect market.

Whenever an actual market approaches the perfect market society as a whole benefits. The producer, because of more knowledge about market conditions, is able to direct his produce to those markets that pay the highest prices, thus gaining for himself. However, by directing his produce to the market where the highest prices exist he saves a good deal of cross hauling. When this cross hauling is saved the average price of the processed product will be lower. Thus consumers as a whole benefit.

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[1]Geoffrey S. Shepherd: Agricultural Price Analysis, The Iowa State College Press, Ames, Iowa, 1941, p. 127.

Scope of the Study

A price differential between markets does not suggest that a marketing system is not working perfectly. There may be sound reasons for a particular price differential between these markets. This study will make an attempt to show graphically the absolute price differential between the selected markets, and also the price relationship that these markets have to each other. This price relationship will be shown by a simple correlation coefficient. The simple correlation was considered sufficient evidence to show the price connection between these markets. A test of significance will be applied on the correlation coefficients.

The study will deal with two time periods; namely 1935-1940 and 1949-1955, known as the pre-war and post-war periods respectively. Only prices at public livestock markets will be analysed. The official marketing publications and the Dominion Bureau of Statistics publish only weighted average prices. It is these weighted monthly average prices that will be used in this study.

To examine the price differentials for all classes and grades of livestock would, of course, be a formidable task, and it is doubtful if it will improve the accuracy to any significant degree. To give only a small indication of the enormity of the task let us examine the classification butcher steers. This category is first divided into two weight classes. Then each weight class is divided into four grades: namely, choice, good, medium and common. This means that for one class of animals there are eight grades. Each one of these eight grades is a different product. If one were to examine the price relations for all these grades between the various markets the number of combinations become enormous. If, for example, only two markets are considered there will be eight combinations. If a third market is added the number of combinations becomes twenty-one. Therefore, several samples which were considered to be representative classes and grades on the selected markets will be studied. The grades chosen for this study were good steers up to 1000 pounds, good stocker and feeder steers, good cows and B_1 hogs.

The criterion followed in selecting the above sample was simply that each grade should represent a large part of total sales in that particular market. Of all butcher steers marketed the predominant group was good up to 1000 pounds. Good stocker and feeder steers were selected since it is not a finished product, as good steers up to 1000 pounds. This gave a good basis to study the price relationship between markets for a finished and an intermediate product. Good cows were chosen, because they represent a by-product from another enterprise, which may be marketed seasonally, thus giving rise to small numbers marketed at one particular time and large numbers at another time, thus causing wide price differentials. B_1 hogs were chosen since payment to the producer is based on it. For all hogs B_1 is the basic grade. If a producer markets a hog carcass that is superior to B_1 grade he receives a premium, if he markets one that is inferior he receives a discount.

The study will examine livestock prices on all major Canadian and a few United States livestock markets. This means that the whole of Canada and part of the northern United States will be considered as one market. The specific markets are Toronto, Winnipeg, Moose Jaw, Calgary, Edmonton and

Vancouver, in Canada: Chicago, South St. Paul and North Portland, in the United States. The Canadian markets were selected because about 80 per cent of all livestock sold in Canada is marketed at these points. United States markets were selected since it was felt that they could have an influence on prices in the Canadian markets, because of their close proximity to them.

The markets described above cover a large area. From Toronto to Vancouver is approximately 2700 miles and the belt is about 700 miles wide. In this market area there are some points classified as surplus and others as deficit. These conditions over time, however, may change. In this study an attempt will be made to show the change, if any, that has taken place.

CHAPTER II

THEORY AND METHODOLOGY

Theoretical Framework Dealing with Spatial Price Differentials

A price differential suggests immediately that the commodity is not a perfect substitute. The degree of substitutability will depend on the degree to which the various utilities of form, possession, time and place, are involved. Whenever one or more of these utilities are involved in a commodity there is, immediately, room for price differentials to exist. Thus in the field of pricing utility factors will be taken into account. They will either be discounted or appreciated as the case applies.

Theory of the Perfect Market

The concept of the perfect market has been used as a yardstick to measure the marketing efficiency of many markets. It is unlikely that any existing markets approach the perfect market. As a criterion for markets in real life it has been accepted by many. A marketing firm, function, or system cannot be judged as efficient or economical in any absolute sense, but only relative to alternatives or to some standard. Studies may be designed to show how the existing marketing methods could be improved, i.e., made more efficient and less costly. To be more useful, however, marketing research should be oriented with reference to some concept of an ideal or perfect market.[1]

The only concept coming close to the above is that of the perfect

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[1] R. J. Bressler Jr. "Agricultural Marketing Research," Journal of Farm Economics, Vol. 31, No. 1, Part 2, February 1949, p. 54.

market. A test of efficiency in the pricing of commodities is given by the perfect market. Geoffrey S. Shepherd defines it with respect to the act of price discovery as one that would result in "a price that would be uniform (plus or minus shipping costs) over a market area at any time, and (plus or minus storage costs) over a period of time at any one market ... (and) a uniform price for a commodity (for example hogs) plus or minus appropriate price differentials for different classes and grades within that commodity."[2] If the perfect market can be expected to be achieved the first and foremost condition is that there be a large number of buyers and sellers. Each one of these buyers and sellers must not be able to influence the price making forces at work in that market. All buyers and sellers must have perfect knowledge of supply, demand, and prices and act rationally. This assumes perfect competition and as a result only one price will prevail throughout the area at a particular point in time.

Price Changes Over Time

In the market place the forces of supply and demand determine price. Demand is dependent on population, income, income distribution and taste. The characteristics of the factors that influence the demand curve make it possible for it to increase gradually over time. The supply of a commodity, however, may not enter as smoothly. This, of course, depends on the nature of the supply conditions. The extent to which complete adjustment cannot be made in the supply of a commodity to the demand for that commodity will affect prices. Therefore price adjustments must always take place as time elapses.

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[2] F. L. Thomsen, R. J. Foote, Agricultural Prices, McGraw - Hill Book Company Inc., 1952, p. 128, citing Geoffrey Shepherd, "A Framework of Marketing Theory", Dept. of Economics and Sociology, Iowa State College, Ames, Iowa, 1958, p. 20 (mimeographed)