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PRICING EFFICIENCY IN AGRICULTURAL MARKETS IN PAKISTAN

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PRICING EFFICIENCY IN AGRICULTURAL MARKETS IN PAKISTAN

INTRODUCTION AND BACKGROUND

It is now a well-recognised fact that there exists a positive correlation between the goals of development planning on the one hand and the structure, conduct, and performance of agricultural markets on the other [2]. In general, every marketing system is supposed to perform the function of signalling prices to consumers and producers and thus to bring about the allocation of available supplies among consumers and of resources among producers. In developing countries one of the popular views is, that the markets for agricultural commodities do not operate efficiently in price-signalling, and that there are great differences between prices paid by the consumers and those received by the producers (farmers), both over time and space.[1] Such inefficiencies are said to be caused mainly by monopolistic elements, and the traditional marketing practices, involving different kinds of middlemen and intermediaries which result in, unduely, higher marketing costs. It is further maintained that these markets do not have the necessary arrangements to check year to year fluctuations in the price level which are extremely harmfull for long run economic development. And particularly after the Green Revolution, when these countries experienced a rapid growth in their farm output, serious doubts were expressed about the capacity of their marketing system to bear the added burden.

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[1] See John K. Galbrath and R.H. Holton, "Marketing Efficiency in Pureto Rico, P.T. Bauer, West African Trade" pp. 388-389 and Leaon Hirsch "Marketing in Underdeveloped Economy" for discussion about marketing efficiency in developing countries.

Such a view has very often become the basis of governmental interference with the trade in these countries.

Pakistan is not an exception to it. During the past two decades policies like compulsory procurements, fixation of ceiling and floor prices rationing and fair-price distribution have all been used, singly or simultaneously by its government [8]. Even the replacement of traditional market structure by some governmental organisation has been under consideration for some time. However it could never go ahead with this type plan as most of its policies concerning agricultural marketing were facing serious problem in their implementation.

A part from the administrative problems in implementing these policies one major cause of their failure was lack of proper knowledge about the working of the existing marketing system and the degree of its pricing efficiency. Presently available literature on marketing in Pakistan does not provide insight to the problem, as it deals only with the description of the institutional set up, and uses information collected many years ago, and thus neglects current developments [3, 9, 10]. It also neglects some of the important aspects of the agricultural markets, relating to regional and seasonal variations in prices.

In this field, a first good attempt was made by Dr. Sarfraz K. Qureshi [8] who analysed the performance of village markets (one kind of agricultural markets in Pakistan). He wanted to compare his results with the findings of a study done by Uma J. Lele [9] in the case of Indian markets, therefore he followed Lele's approach. Qureshi concluded that contrary to the

established view, our system of agricultural markets is very much competitive in nature and the oligoposomistic structure of these markets which prevailed in British India (Before 1947) does not exist any more. According to him structural changes have taken place in marketing activities due to credit and transportation facilities provided by the government during the past two decades.

But, such conclusions, although quite appealing, can not be accepted without further justification. Firstly, because the scope of Qureshi's study is limited, as it covers only one kind of market and neglects the other markets (which include town markets and the terminal markets[2], the working of which is different than the village markets. Secondly he used cross section data of only one year which was not enough to analyse the evolution of the agricultural markets, as attempted by him.

This report attempts to improve upon Qureshi's analysis by studying the agricultural marketing system as a whole. Particularly an effort is made to determine the nature and extent of pricing efficiency by observing the price movement and price formation processes of those markets not covered by him.

However due to the restrictions on the lenghth of this kind of report, I have carried out my analysis in terms of only one commodity i.e. wheat. Wheat is the most important cereal grown and consumed by the people of Pakistan. In terms of area and production it stands at the top of all the crops of Pakistan. For example

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[2]For detailed description of these markets please see section II.

in 1971-72 the area under wheat alone was 33.73% of the total cropped area while its production was 62.8% of the total food grains (5 P.11) most of the marketing practices adopted in the case of wheat are also used for other commodities. Therefore there is no much risk involved in extending the conclusions of my analysis to most of the agricultural commodities in Pakistan.

The report is divided into five main parts. Part I deals with the geographical setting of the markets selected for this study. Part II examines different features of the agricultural marketing system with a view to test the hypothesis of its competitiveness. Part III brings forth those aspects of these markets which disprove the existing view that our markets are oligopolistic and not competitive in nature. In part IV some empirical methods of measuring the degree of pricing-efficiency of these markets are used and results so obtained are interpretted. Conclusions and policy implications of our analysis are given in the final part.

Part I - MAJOR WHEAT-MARKETS AND THEIR GEOGRAPHICAL SETTINGS

Wheat is grown only in three out of four provinces of Pakistan. However Punjab (see figure I) is the only province where the largest share of the marketable surplus is available, and is moved from its markets to the markets in deficit areas. Table 1, presents data on wheat production and marketable surplus of a few years for a number of markets belonging to different provinces of Pakistan. It clearly indicates that 10 out of 24 markets have potential for releasing wheat surplus to deficit areas like Karachi.

They are Lahore, Lyallpur, Multan, Sahiwal, Gujranwala, Sargodha, Sheikhupura, Sialkot, Hyderabad and Peshawar. All these are the primary-wholesale markets[3] located in their respective district towns. I have selected two more primary-wholesale markets which are not given in Table 1, but are generally recognised as important wheat markets of Pakistan. The reason why more markets could not be selected was lack of consistent time series data, which I wanted to use for empirical tests, about the rest of the markets.

From the same Table we can, see that Karachi and Rawalpindi are among those markets which do not have any significant production in their own district areas. Since they are among the biggest consumption centres (having population of 3.47 and .615 millions respectively[4] they import large quantities of wheat from the primary wholesale markets listed above. I have taken these two markets as the terminal markets (see section II below).

As we know the distance between the markets is a determining factor for inter-market mobility of the product, I have shown the approximate distances between the selected markets in figure II.

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[3]For detailed description of those markets see section II part (4).

[4]See (5)

THE NATURE OF TRANSPORTATION NETWORK IN PAKISTAN

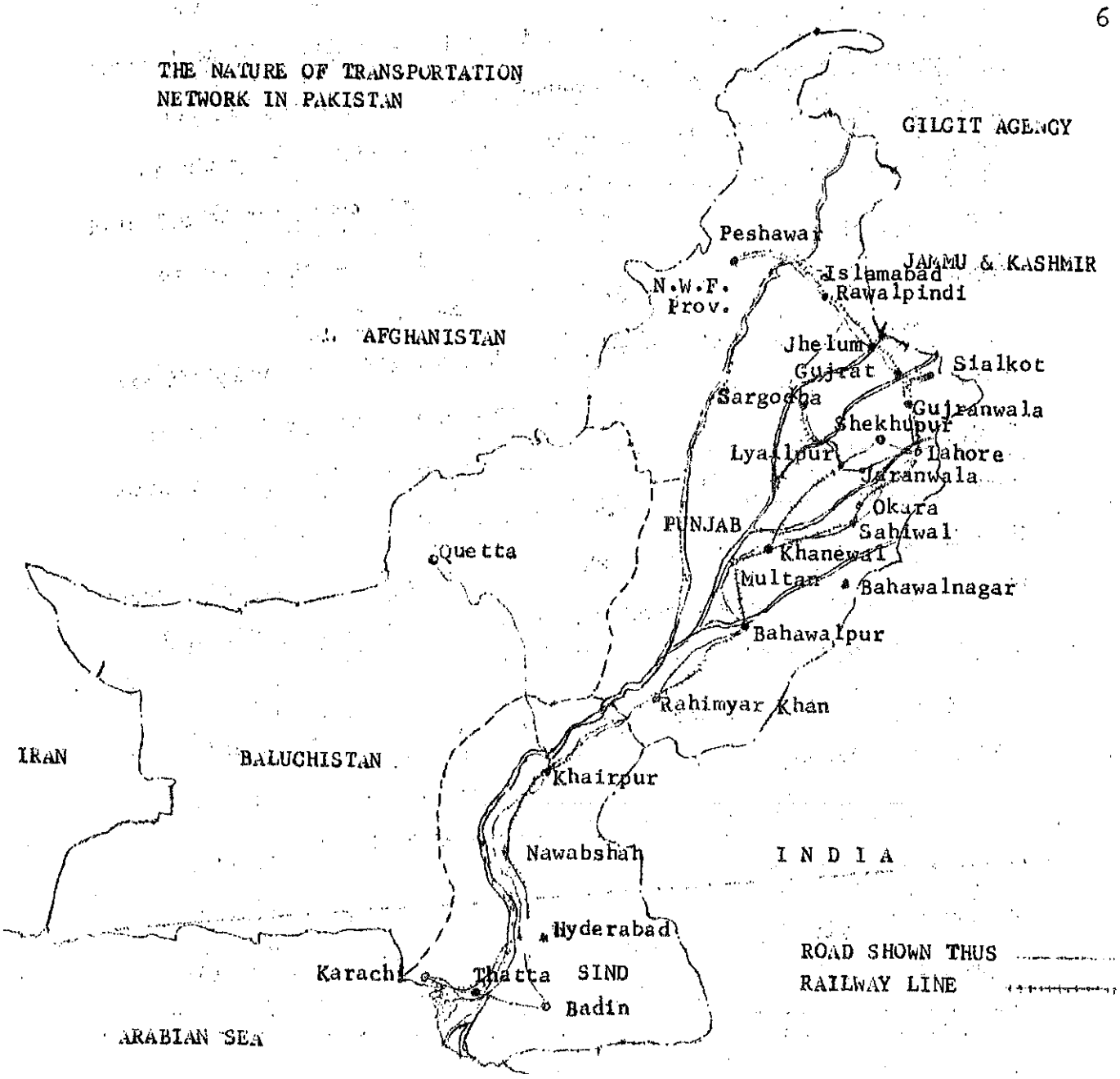


Figure 2

Approximate distances between wheat markets of Pakistan (by roads, in miles)

Karachi (1)													
125	Hydrabad (2)												
555	430	Multan (3)											
725	600	120	Sahiwal (4)										
755	630	150	30	Okara (5)									
785	660	180	60	30	Jaranwala (6)								
815	690	210	90	60	30	Lyallpur (7)							
825	700	220	100	70	80	85	Lahore (5)						
850	725	245	125	95	50	60	25	Shakhupura (7)					
855	730	250	130	100	70	40	125	100	Sargodha (10)				
865	740	260	140	110	85	95	40	35	135	Gujranwala (11)			
895	770	290	170	140	115	125	70	65	165	30	Sialkot (12)		
1000	875	395	275	245	215	225	175	165	265	135	130	Rawalpindi (13)	
1100	975	495	375	345	315	325	275	265	365	235	230	10	Peshawar (14)

Table 1

Wheat Production and Marketable Surplus in Some of the Important Districts of Pakistan (1967-70)

(in thousands of tons)

Name of Districts/(Provinces (Markets)		(1) Production			(2) Marketable Surplus		
		1967-68	1968-69	1969-70	1967-68	1968-69	1969-70
1. Peshawar	(N.W.F.P.)	74.8	79	83	7	10	12
2. Hazara	"	40.4	42	36	-	-	-
3. Rawalpindi	(Punjab)	18.5	57	61	-	-	-
4. Sargodha	"	363.3	384	453	19	90	76
5. Lyallpur	"	583.1	622	659	71	165	95
6. Sialkot	"	210.9	209	253	16	20	24
7. Gujranwala	"	207.4	236	264	39	50	55
8. Sheikhupura	"	193.7	218	251	10	54	51
9. Sahiwal	"	582.5	642	669	47	102	91
10. Multan	"	789.1	797	818	81	120	70
11. Hyderabad	(Sind)	152.5	157	196	31	42	16
12. Karachi	"	0.1	-	-	-	-	-
13. Lahore	(Punjab)	174.1	226	248	28	60	36
14. Campbellpur	"	151.7	112	116	4	4	2
15. Gujrat	"	138.9	144	158	16	17	12
16. Mianwali	"	152.2	164	179	5	5	3
17. Jhang	"	278.1	286	322	12	36	31
18. D. G. Khan	"	132.5	133	136	15	12	4
19. Muzaffargarh	"	309.8	330	363	7	19	6
20. Bahawalnagar	"	155.3	167	182	-	-	-
21. Rahimyar Khan	"	230.6	235	222	14	19	8
22. Nawab Shah	"	146.6	173	209	9	23	40
23. Khairpur	"	76.8	71	107	4	11	12
24. Sangar	"	88.6	89	120	16	26	1

All those markets are well connected with railways and road system. However, some of them, like Jaranwala, Sargodha and Sialkot markets, are located on branch lines and have comparative disadvantage in the shipment of goods to other markets. Figure I also gives a glimpse of the transportation network available to our markets.

Part II. FEATURES OF AGRICULTURAL MARKETING SYSTEM IN PAKISTAN

(A) CHANNELS OF WHEAT-MARKETING

In Pakistan a large quantity of wheat production, like all other food crops, never leaves the farm, but is retained for domestic consumption, for feed, for seed and for payments to agricultural labour. The marketable surplus that leaves the farm moves from small markets to large urban centres through a multiplicity of intermediaries, mainly in a unprocessed manner.

A complete picture of the channels of wheat marketing is given in figure 3. Among these channels three kinds of markets can be distinguished from one another on the basis of marketing place and the nature of traders involved. They are: 1. village markets 2. primary-wholesale markets (herein after referred to as either primary markets or wholesale markets and 3. terminal markets. In the following we discuss the features of these markets in some detail.

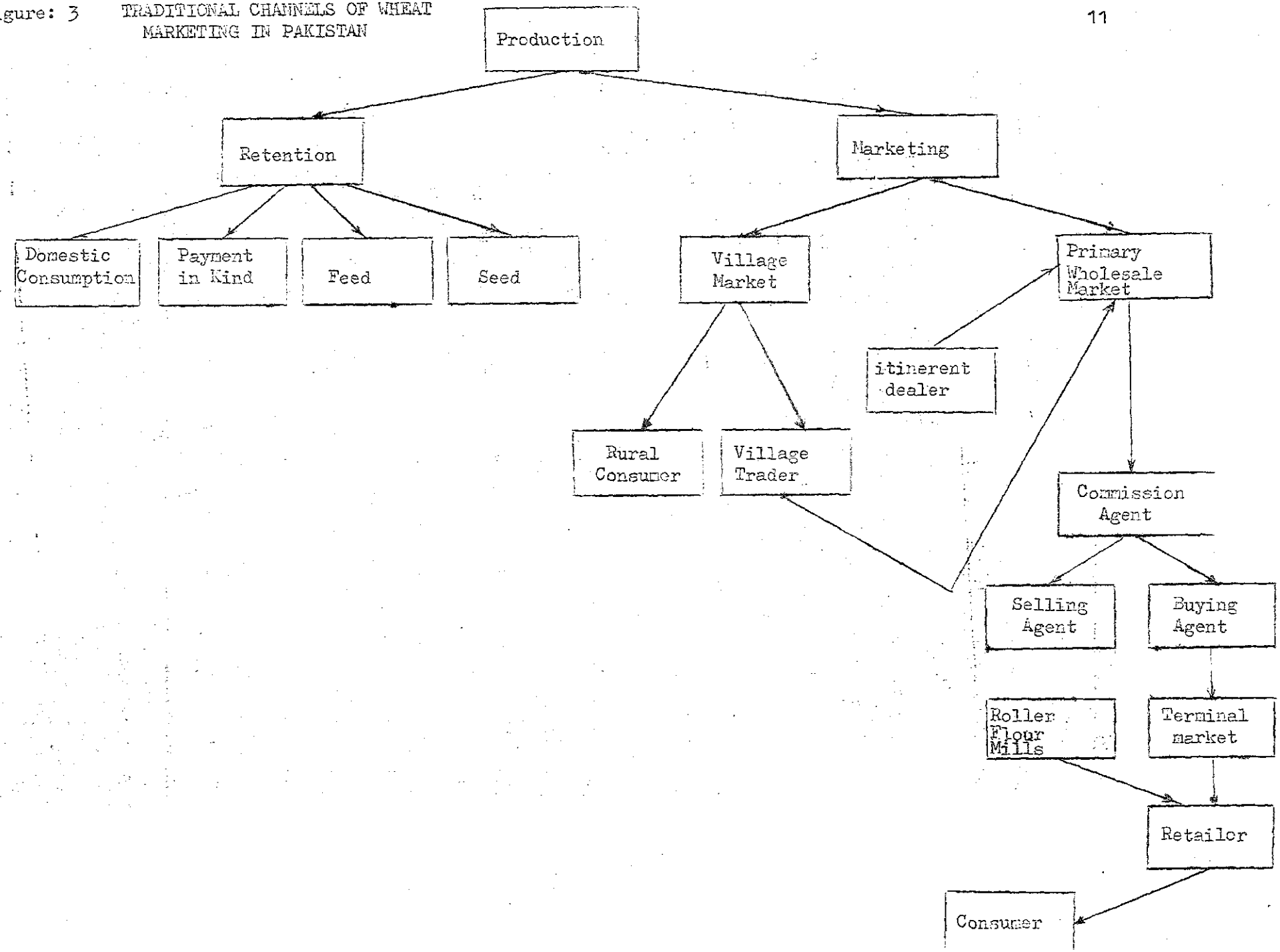
1. Village Markets

Village markets are situated near the farms, generally in a small town, where significant part of the product is sold by the

farmers. A village shop-keeper or itinerant dealer acts as buyer in these markets. Most of the transactions here involve small quantities. Producers sell their surpluses and purchase supplies for their daily requirements. A part of the product is purchased by small retailors who in turn sell itto the non-farm population or later in off-season back to the cultivators themselves. Traders in these markets are not approved by any government agency. Therefore no systematic record of the transactions is maintained by them. Price-formation process is very simple. A direct negotiation between the village traders and the cultivators settle the price. Since the transactions involved are very small, some under-pricing is also noticed in these markets as the farmers do not mind for small price differential (compared with wholesale markets) if he can buy his requirements by selling a part of his produce conveniently in the nearest market. However, for the larger quantities, farmers prefer to go to the wholesale markets or at least try to compare the price with those markets before they make the deal.

As for the share of marketable surplus going to these markets, it has yet, not been estimated exactly in the case of Pakistan. According to some studies [8] quite a significant proportion of wheat is sold in the village markets. But unfortunately due to non-availability of any systematic data on the transactions carried out in these markets they can not be covered by the present analysis. Therefore from now on ward we will concentrate on the other two kinds of markets.

Figure: 3 TRADITIONAL CHANNELS OF WHEAT MARKETING IN PAKISTAN



2. Primary-Wholesale Markets

These markets, as we saw in Part I, are usually situated in district towns, or towns having good railway and road links with the big consuming centres. They transact a large volume of business every day brought here by the village traders and the farmers.

There are two types of traders who operate in these markets, apart from the local consumers and retailers who occasionally may buy some quantities directly. Both kind of these traders are sometime termed as commission agents. However, there is a great difference in their activities, which is evident from the followings. First type of traders are known as selling-agents. They usually provide selling services to the village traders and farmers who bring their produce on their shops, and get a certain percentage of total sales as commission (at present it is 1.5%). Such a percentage of commission is fixed by a market committee[5] created through a government law. They also provide the facilities of weighing, bag-filling, loading and unloading of the produce for which they again charge[5a] the sellers.

Apart from providing the selling services they also buy some quantities for themselves for keeping stocks, which they sell in the market during the off-season. In this way they equally compete with other buyers, whereas their main responsibilities still remain to buy for others, and provide marketing facilities.

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[5] Each primary market has a market committee, on which growers, traders and local bodies are represented. The committee in their byelaw, define market practices and fix market charges payable by various parties. Among the important functions of the committees are settlement of disputes, licencing of market functionaires and correct weighing of the produce /3/.

[5a] See Part II (2) for details of the marketing costs involved.

The second type of traders are known as buying agents, they buy major part of the wheat sold in these markets. They are relatively well-established traders and maintain their business contacts with he traders in other markets; particularly in the terminal markets. As such most of the exports to the terminal markets are made by these traders. They also act as wholesalers to the local retailors.

All these traders and the agents of the flour mills (usually selling-agents) taken togather represent demand for wheat in each market on a particular day. They move arround different shops where wheat is kept in bags or on a open space in front of each shop, and buy their desired quantity through open auction. Everybody bids his price openly (or sometime by writing on a piece of paper) and the transaction takes place if the highest bid is acceptable to the farmer or the millage trader involved. This process has erradicated the use of old practices, like sign language and undercover methods,[6] which were common in British India.

3. Terminal Markets

These markets are generally situated in large urban centres. Most of the wheat sold here is brought by the traders from the primary-wholesale-markets rather than the cultivators or the village traders. Traders in these markets are the wholesalors who supply grains to the floor mills and the local retailers. A part of the wheat from these markets is sent to the adjoing deficit areas. Marketing activities in these markets are very much different than the other markets due to the different nature of the buyers and sellers involved. (see below)

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[6] In the past, sometimes the traders used to settle the price by putting their hands under a cover and using some sign language which was not known to the farmers. This method is prohibited now by the market committees.

B. ROLE OF INTERMEDIARIES IN INTER-MARKET FLOWS

After we have examined the features of the different kinds of markets in Pakistan, it will be interesting to know how wheat flows between the markets and what role is played by the intermediaries in such flows.

A very important aspect of inter-market flows is the transfer of wheat from small-primary markets to large primary markets. In Pakistan big markets like Lahore, Lyallpur and Multan are considered is the assembling centres for the small primary markets. As a result much of the exports to Karachi and Rawalpindi importing markets are made from these markets. However, traders in Karachi also buy directly from the small primary markets, which keeps the price level in all the markets close to each others.

Purchases are made by the terminal markets traders in three different ways:

1. Many traders visit the major export markets and the small primary markets after the herrest season. Such a visit itself, usually causes a bullish tendency in the markets.

2. Every assembly market receive orders from the importing centres for large scale purchases. Traders in the importing centres make a careful survey of various price quotations received from different markets. There is usually a keen competition among the assembly markets for these orders. This keeps price in these markets at a par. If a price quotation from the next assembly market is slightly lower an importer usually shifts to that market. As a result the price level in small

primary markets also remain at par with the prices prevailing in the nearby assembly markets. Both cultivators and village traders would take their produce to the big assembly markets if the prices in that market were significantly higher than the prices in the nearby small primary markets.

3. Traders in importing centres advise their agents in the assembly markets and in the primary markets to pruchase grain on their account to be shipped to them later in the season. This kind of purchases require mutual understanding and faith between the trader and his agent. This once again forces the traders in these markets to work on competitive basis, otherwise there is every chance that his fellow traders take over his position.

In addition to the inter-market flows between small and large primary markets and between primary and terminal markets, they are direct flows of wheat from the village markets to the terminal markets, although not at a very large scale. This helps both cultivators and the village traders to be aware of the prices prevailing in the terminal markets.

C. FLOW OF MARKET INFORMATION BETWEEN TRADERS

The methods and practices adopted by the traders to get information about other markets has an important bearing on the inter-market mobility of the product and on the settlement of its price. In Pakistan the most important source of such information is the personal contact. Although crops and prices are reported in newspapers and broadcast on radios, heaviest reliance is placed on information

gathered through personal contacts. Traders in primary markets get information about the crop condition in their areas by talking to cultivators from nearby villages who usually visit their shops.

In order to establish trading contacts traders in primary and terminal markets send their agents to various major markets. This also enables them to acquire first hand reports on crop outlook and demand conditions in important centres. This has been an age-old practice in the grain trade. Once such contacts are established there is a mutual understanding about the free exchange of market intelligence. Traders in primary and terminal markets also use post cards telegrams and telephone to maintain their contacts with each other.

Movement of fellow traders is another source of information for the traders in the primary markets. Every trader in the primary market is on the lookout for any orders that his fellow traders may receive from the consuming centres. If he notices heavy orders form a particular terminal market he would usually contact his own counterpart in that market to get similar order.

As for the overall condition of market-intelligence in Pakistan, one should not be very optimistic about it. Use of personal contacts remains the dominant source of information, and other sources like newspapers radio and T.V. are either not very reliable or improperly utilised. Very little responsibility is shown in collecting prices for reporting purpose. As a result neither traders not cultivators put much reliance on these media of information. Similarly the communication system, particularly the telephone-system is not very efficient. There are many traders who do not have their own telephone

as it is very difficult to get it, and those who have this facility face numerous difficulties in approaching the traders in distant centres due to the lack of direct telephone lines to such places. As a result, although some of the traders in the terminal markets have their agents in the primary markets they can not utilise their services very efficiently.

This shows that there is no basic inefficiency in the working of these markets or in the behaviour of the traders, rather it is the inadequacy of some of the basic facilities which might cause some inefficiency. However, a further investigation is required to be sure if our market structure is competitive and not oligopolistic in nature. This I have done by observing, the number of traders in some of the markets under study, the distribution of sales among the traders, and the condition of entry and exit in wheat trade, in part III.

Part III. COMPETITIVENESS OF MARKETS: A HYPOTHESIS

(A) NUMBER OF TRADERS

As we know, if the number of traders in a market is very small this could lead to some kind of collusion among the traders. However such a policy is very difficult to pursue if the number of traders gets larger. Traders in this situation may find it impossible in developing a common policy owing to the difficulties in resolving the conflicts of interest or simply of opinion.

Table 2 shows the number of traders (both selling-agents and

Table 2

Number of Traders in Different Markets of Pakistan: 1965-1974

Years	Gujranwala		Sialkot	
	Selling Agents	Buying Agents	Selling Agents	Buying Agents
1965	89	19	105	23
1966	85	19	103	23
1967	88	20	109	24
1968	95	23	125	27
1969	105	25	130	28
1970	103	25	130	28
1971	98	25	115	27
1972	105	26	120	29
1973	110	25	125	29
1974	115	26	130	30

Source: Reports of the Agricultural Market Committees (unpublished)

the buying-agents) in the markets of Sialkot and Gujranwala[6a], which were selected at random from the sample of our markets, during the last 10 years (1965-74). It is evident from this table that in these markets the number of traders i.e. potential competitors has been very large. It rather shows the over crowdedness of the markets, which some time has resulted in exit of traders from the trade in recession years, like 1965-66, and 1970-71. However in general their number has been increasing as new entrants appeared. This is again a strong indication of competitive forces in these markets.

(B) DISTRIBUTION OF SALES AMONG TRADERS

In a situation where a handful of traders purchase a major part of the produce sold in a market, a certain degree of monopolistic power will be enjoyed by these traders. To analyse this aspect of our markets, I have observed the distribution of sales of wheat among traders again in the markets of Sialkot and Gujranwala during 1974-75.

Table 3 shows the percentage of wheat purchased by different kind of traders in these markets. One may conclude from this table that there is a some degree of concentration of economic power, as the number of buying-agents, purchasing more than half of the wheat sold in these markets is not very large. But such a conclusion is misleading to some extent.

6a Selection of only these two markets were made mainly to ease the huge task of data collection which in the case of all the markets would have become impossible, both physically and financially, for us to fulfil. In any case it does not make much difference to our argument if we ignore some of the markets at this stage.

Table 3

Distribution of Sales of Wheat Among Traders in Two Primary Markets of Pakistan in 1970-75

Markets	% of wheat purchased by Traders	Number of Traders purchasing the percentage in (1)	% of wheat bought by all the commission agents	% of wheat bought by small buying agents and other buyers	Total (1+3+4)
	1	2	3	4	5
SIALKOT	50	14	20	30	100
GUJRANWALA	52	12	20	28	100

Source: Weekly Reports of the Agricultural Market Committees.

In the case of our markets there are so many other factors which discourage the oligopolistic elements in spite of the fast that the number of traders buying major portion of the produce is not very large. Two important factors are: relatively free entry into trade and, lack of co-operation among the traders.

Entry to Trade

The factors that may restrict entry into the grain trade in Pakistan could be classified into three categories:
Social, Governmental, and Financial.
Before the Partition of India (Before 1947), social factors were operatively very strongly. There was a particular

community[7] of traders who controlled the whole of the grain trade. People outside this community could hardly dare to enter this field due to the hostile business tactics of the traders belonging to that community.

After the partition the situation is completely changed. Almost all the traders belonging to that community have migrated to India and there is a no single community like that who has tried to replace it. At present the traders in all the markets belong to different castes and come from different professional background. There are some traders who were doing other businesses, like retailer's shop, before the Partition and now have shifted to the grain trade, whereas many other belong to the cultivating familes. This has made the grain trade like all other professions which was not the case about 30 years ago.

Governmental restrictions come through the issuance of licence to the traders which it does to every one who applies for it. Thus, in practice it is not a restriction.

The only big restriction could be the availability of capital. But in the case of grain business this restriction is also not very important. A meagre amount of capital is required to enter the business. Therefore anyone who owns 20 to 30[8] thousand Rupees will find no problem in going to this business. This shows that entry in to grain trade is very easy, which discourages the big traders to use any monopolistic power.

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[7] This community is known as Bunyas in India which is a business class among the Hindus.

[8] Many traders to whom I interviewed in different markets gave this figure as low as 10 thousand Rupees.

b. Lack of Co-operation Among Traders

The second major factor which seems to make oligopoly unworkable is the lack of desire on the part of the traders to co-operate for mutual rewards. This is evident from a number of factors.

1. Nature and Extent of Partnership

A familiar feature of the grain trade in Pakistan is the predominance of single family firms. Most of the firms are partnership between immediate members of a family (as between brothers or between a father and his son), and a very few of them involves members of different family. For instance, in the markets of Sialkot out of 20 firms I investigated only 4 were partnership between different families. In Gujranwala this ratio was 1 out of 8.

2. Absence of Trading Organization

Lack of active co-operation among the traders is also evident from the absence of any major traders organization. Some of the associations like Punjab Traders Association and Karachi Traders Association which exist at present are simply the spokesmen of the trading interests and act as pressure groups. Even this kind of objective is not being served properly by such associations as majority of the traders remain indifferent to their activities.

Lack of mutual co-operation among traders is not very surprising if we look at the extreme-self interest by which they are guided and the extreme secretiveness which they maintain about their profit-loss statement. Oligopolistic forces can not survive under these circumstance.

Part IV. PRICING EFFICIENCY: SOME EMPIRICAL RESULTS

The preceding sections were aimed at examining those aspects of the agricultural markets which could affect the price-formation process for wheat, in one way or the other. However we are still not in a position to draw some definite conclusions about the level of pricing efficiency attained as a result of the marketing-activities discussed above. For this purpose, I have used the following efficiency criteria which are adopted by many other studies.[9]

(A) Market-Integration

In a competitive market structure, prices in geographically separated markets are expected to move in a uniform manner in response to changes in economic forces like supply and demand. The speed and accuracy with which prices react and adjust to these stimuli can be taken as an indication of the degree of interrelationship between the markets. To find this degree a commonly used method is to compute the coefficients of correlation between prices prevailing in different markets at different points of time. This will give the extent to which the markets are integrated.

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[9] See Lele (4) and Rarruk (1).

(B) Intermarket Price Differential

Again in a market-structure satisfying the pre-conditions of perfect product mobility not only the correlation coefficient should be very high but also intermarket price differentials should be equal or less than the transshipment costs (which include all costs of shifting goods from one market to the other). Any difference in prices of various markets in excess of these costs will result in arbitrage by the traders untill this is eliminated. Thus by computing the transshipment costs on the one hand and price differentials between the markets, on the other, one could determine as to how far they satisfy the conditions of a competitive marketing system.

(C) Inter-Temporal Price Differential

Similarly under a competitive market structure the off-seasonal rise in price of a commodity should be just equal to the storage costs and normal profits of the stockist. Thus by computing the actual costs incurred in the operation of storing a commodity, one could compare them with seasonal variations in prices of that commodity. This comparison will determine the extent of efficiency of prices over time in various markets.

(D) Data

To test pricing efficiency according to the above stated criteria, I have made use of the following data:

1- Average weekly wholesale prices data on wheat for 20 years, from 1961-70.

2- Data on transshipment costs.

3- Data on the storage costs.

Time-series data were taken from a monthly publication of the Marketing Adviser Govt. of Pakistan, namely "Market and Price (6) which contains the record of prices in a number of primary and terminal markets.

Data on storage and transhipment costs were not available from any published source in a complete form. Therefore, I had to get them directly by interviewing a cross-section of traders in a number of markets.[10]

(E) Results and Their Interpretation

(1) Market Integration

Before presenting the empirical results, I must point out that the degree of market-intergration is not likely to be perfect i.e. correlation coefficient (r) will not be equal to one, because the ideal situation of perfect competition does not exist in actual trade. There are a large number of factors which make its value less than one. The stronger the effect of these factors the lower the degree of market integration and vice versa. However, if the value of the correlation-coefficient is much less than one this indicates gross imperfections in the market-structure. The important factors which limit the degree of market integration are:

i. Lack of perfect inter-market product mobility -

If transportation and communication is slow and underdeveloped quick arbitrage by the traders is not possible which may result in dissimilarity in the direction of price movements in various markets. Imperfect knowledge about supply and demand situation in various markets is another factor which results in imperfect mobility;

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[10] The markets surveyed were Sialkot, Gujranwala and Rawalpindi.

ii. Magnitude of the transshipment cost:-

The magnitude of the transshipment costs sets the range within which price between the markets can move without calling any movement from other markets Greater the transshipment costs between two markets lower the value of correlation-coefficients and vice versa; 3 Institutional rigidities such as governmental restrictions on free movement of commodities can be an additional barrier in the way of perfect mobility and may result in lower correlation between inter-market price formation.

Keeping in view all these factors I have computed the coefficients of correlation between 12 primary-wholesale and two terminal markets, which are presented in table 4. Table 5 shows the frequency and percentage distribution of these coefficients. To compare our results with those found in the case of India by Uma J. Lele (4), I have also given the results of Indian case study in table 5. From table 4 and table 5 we find that:

a. Correlation among primary markets (Primary-Primary) is higher than between primary and terminal markets (Primary-Terminal), in the case of Pakistan.

b. Market integration among the markets of Punjab is greater than between the markets of Punjab and the markets of other provinces. This was very much expected as the distance within the Punjab markets is less than the distance between the markets of Punjab and the markets of the other provinces.

c. Karachi has a higher degree of market-integration with the markets of Punjab than Rawalpindi has with them.

d. Correlation among primary markets and between primary and terminal markets of Pakistan is lower than that computed by Lele for wheat markets of India. [7] It may be pointed out here that Lele estimated the coefficient of correlation between the price of the primary wholesale markets of East Punjab (Indian part of Punjab) and Delhi terminal markets.

Table 4 - Matrix of Correlation Coefficient (r) Between Prices in Various Primary and Terminal Markets of Pakistan

Sl. No.	Markiz	Karachi	Hyderabad	Multan	Sahiwal	Okara	Jaranwala	Lyallpur	Lahore	Sheikhupura	Sargodha	Gujranwala	Sialkot	Peshawar	Rawalpindi
1.	Karachi	1.00													
2.	Hyderabad	.86	1.00	.85	.80	.81	.78	.86	.85	.80	.82	.79	.81	.70	.66
3.	Multan	.79		1.00	.87	.91	.93	.99	.99	.85	.86	.86	.85	.59	.65
4.	Sahiwal	.78			1.00	.93	.95	.88	.90	.86	.85	.89	.86	.74	.72
5.	Okara	.78				1.00	.98	.99	.97	.88	.89	.92	.88	.65	.69
6.	Jaranwala	.75					1.00	.99	.98	.85	.84	.90	.84	.61	.63
7.	Lyallpur	.82						1.00	.92	.89	.95	.89	.92	.66	.72
8.	Lahore	.82							1.00	.94	.93	.89	.92	.68	.70
9.	Sheikhupura	.77								1.00	.89	.87	.90	.63	.66
10.	Sargodha	.76									1.00	.93	.92	.63	.67
11.	Gujranwala	.75										1.00	.85	.65	.63
12.	Sialkot	.75											1.00	.61	.65
13.	Peshawar	.75												1.00	.77
14.	Rawalpindi	.72													1.00

Table 5 - Frequency and Percentage Distribution of Correlation Coefficients Between Primary-Primary and Primary-Terminal Markets wholesale Prices in Pakistan and India

Correlation Coefficients ('r')	Primary-Primary Markets in Pakistan		Primary-Karachi Markets (1)		Primary-Rawalpindi Markets (1)		All Kinds of Markets in India (2)		Primary-terminal Markets in India (A case of Wheat)		Primary-Primary Markets in India (A Case of Wheat)	
	Frequencies	%	Frequencies	%	Frequencies	%	Frequencies	%	Frequencies	%	Frequencies	%
Less than .60	1	1.51	0	0	0		0	0	-	-	-	-
0.60 - 0.64	4	6.06	0	0	2	15.32	0	0	-	-	-	-
.65 - .69	4	6.06	0	0	6	46.15	1	1.0	-	-	-	-
.70 - .74	2	3.03	1	7.69	4	30.77	7	6.0	-	-	-	-
.75 - 79	2	3.03	9	69.24	1	7.69	7	6.0	-	-	-	-
.80 - .84	7	10.61	2	15.38	0	0	15	13.0	-	-	-	-
.85 - .89	93	34.85	1	7.69	0	0	20	17.0	1	20.0	-	-
.90 - .94	14	21.21	0	0	0	0	34	27.0	2	40	4	40
.95 - .99	9	13.64	0	0	0	0	33	28.0	2	40	6	60
Total	65	100	13	100	13	100	117	100	5	100	10	100

Source: For (1) Table : 4

For (2) see /4/

A question now arises, what are the possible factors which have caused, comparatively, lower degree of market integration between primary-terminal markets of Pakistan. To us the most important factor is the large mangnitude of transportation cost on shipment of wheat to our terminal market from our primary markets than between Delhi and East Punjab's markets. This is true particularly in the case of Karachi terminal market. Since Karachi is located at a far more distant place from our primary-markets than Delhi is from East Punjab's markets. This at one hand slows down the inter-market product-mobility and on the other enlarges the size of the transport costs.

From Table 6, we can see that average, per maund (82½ lb.) transport costs by truck to Karachi in 1967-68 from all the markets were more than three Rupees, whereas between Delhi and East Punjab market the comparable rates were about Rs.1.25.

In the case of Rawalpindi terminal market, there are some other factors which explain the lower degree of market of market integration. First, for most of the traders in Punjab, Rawalpindi is not a well established terminal market when it is compared with Karachi market. Consequently, not much transfer of wheat have been taking place from the primary markets to this market during the period under study. Many economic and non-economic factors have led to this kind of impression among the traders. One of them is the incapacity of this city to consume large quantities of wheat as is done by Karachi. Second, this city has no significant commodity to offer to other places in exchange of wheat which it receives from them.

Table - 6

Per maund Transportation costs (By Truck) from various Primary Markets to terminal markets in Pakistan and India in 1967-68: A Comparison

Pakistan (2)				India (3) Rupees per maund		
S.No.	From	To	Rates	From	To	Rates
(8)	Lahore	Karachi	2.83	(1) Khanna (East Punjab)	Delhi	1.20
(7)	Lyallpur	"	3.12			
(3)	Multan	"	2.12	(2) Moga (East Punjab)	"	1.36
(4)	Sahiwal	"	2.56	(3) Barnala (East Punjab)	"	1.53
(5)	Okara	"	2.56			
(11)	Gujranwala	"	3.12	(4) Kapura (")	"	1.28
(6)	Jaranwala	"	3.12	(5) Jagraon (East Punjab)	"	1.20
(10)	Sargodha	"	3.44			
(9)	Sheikhupura	"	3.12			
(12)	Sialkot	"	3.25			
(1)	Hyderabad	"	0.90			
(14)	Peshawar	"	4.62			

Source: (1) Rated for India were converted from per quintal to per maund basis.

(2) For Pakistan Table 9.

(3) [.....4.... P.100] for India.

Karachi, on the other hand, being the biggest port as well as industrial city of Pakistan, releases many imported and locally produced industrial goods to countries inland in exchange of foodgrains which it received from surplus areas. Due to this exchange pattern of goods both the transporters and the traders have developed some preference for trips to Karachi than to other place. This phenomenon is particularly observed when there is a huge stock of industrial and imported goods blocked at Karachi to be transfered to other parts of the country. In a situation like this, the truck owners are found willing to accept a much less fare for trips to Karachi, as they expect to get higher fare on their return passage than they usually get. But this is not the position of the Rawalpindi market. It has nothing significant to offer in exchange, to other markets. Thus the owners hesitat to carry goods to a place from where the risk of returning empty is very obvious. As a result transportation has been comparatively costlier for Rawalpindi than for Karachi. Another factor which seems to have affected product mobility to Rawalpindi is the government restriction imposed from time to time on movements of foodgrain by road to Northern areas of Pakistan with a view to check sumggling of food to Afghanistan. Since Rawalpindi is located on the way from Punjab to N.W.F.P.,[11] any restriction on this route also hinders smooth and unchecked movement of wheat to this city.

Government restrictions are also responsible for a very low degree of market integration between Peshawar and the other primary

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[11] North West Frontier' Province.

wholesale markets. Since Peshawar is located near the border of Afghanistan in the north, strict checking is done of the truck carrying wheat or other foodgrains to this city. This discourges the traders from moving goods to this market.

(2) Inter-Market Price Differential

As mentioned earlier a lower correlation may also result if inter-market price differences have frequently increased beyond transportation costs and have not been corrected by increased shipments from surplus to deficit regions. To observe this aspect I have estimated the differences between prices of the markets of the surplus regions (primary markets) and of the deficit regions (terminal markets). Such estimates are presented in Table 7 and Table 8, respectively for Karachi and Rawalpindi terminal markets. The frequency distribution and percentages given in Table 7 and Table 8 are arrived at simply by deducting the price of each primary-market in a particular week from the price of a terminal markets in a corresponding week, and then classifying the resulting price-differentials in different ranges. In the case of both of these terminal markets price-differemtials range between $^{-}$Rs.1.50 to $^{+}$Rs.7.50. Negative price differentials signify that prices in the terminal markets were less than the price in the primary markets whereas the converse holds for the positive price-differentials.

To compare the price-differential with the transhipment costs I have estimated total costs of shipment on one maund (82½ Lb.) of wheat to the terminal markets of Karachi and Rawalpindi.

Table 7 - Frequency Distribution of Differences Between Wholesale Prices of Wheat at Karachi Terminal Market and Primary Wholesale Markets (January 1961-December 1970)

	Price Differentials (in Rupees)	FREQUENCIES								
		Upto-1.50	From-1.50 to 0.00	0.00 to 1.50	1.50-3.00	3.00-4.50	4.50-6.00	6.00 to 7.50	7.50 & above	Total No of weeks
Markets										
1-	Lahore (Absolute)	31	87	182	102	20	4	0	0	426
	(Percentage)	(7.28)	(20.42)	(42.72)	(23.95)	(4.69)	(0.94)	-	-	(100)
2-	Lyallpur (Absolute)	34	90	169	101	25	12	0	0	431
	(Percentage)	(7.89)	(20.88)	(39.22)	(23.44)	(5.80)	(2.78)	-	-	(100)
3-	Multan (Absolute)	19	21	85	185	47	11	2	0	370
	(Percentage)	(5.14)	(5.68)	(22.97)	(50.00)	(12.70)	(2.97)	(2.54)	-	(100)
4-	Sahiwal (Absolute)	26	50	140	154	36	21	2	0	429
	(Percentage)	(6.06)	(11.66)	(32.63)	(35.53)	(35.90)	(8.39)	(0.47)	-	(100)
5.	Okara (Absolute)	25	32	121	161	43	8	3	0	393
	(Percentage)	(6.37)	(8.15)	(30.79)	(40.97)	(10.95)	(2.04)	(0.77)	-	(110)
6-	Gujranwala (Absolute)	33	61	164	89	13	5	0	0	365
	(Percentage)	(9.04)	(16.71)	(44.93)	(24.38)	(3.56)	(1.37)	-	-	(100)
7-	Jaranwala (Absolute)	15	20	106	128	71	17	1	0	358
	(Percentage)	(4.19)	(5.59)	(29.61)	(35.76)	(19.84)	(4.75)	(0.28)	-	(100)
8-	Sargodha (Absolute)	27	38	145	116	89	18	0	0	433
	(Percentage)	(6.24)	(8.78)	(33.49)	(26.79)	(20.56)	(4.16)	-	-	(100)
9-	Sheikhupura (Absolute)	47	74	146	112	43	11	0	0	433
	(Percentage)	(10.86)	(17.09)	(33.72)	(25.87)	(9.93)	(2.54)	-	-	(100)
10-	Sialkot (Absolute)	31	52	149	125	55	17	0	0	429
	(Percentage)	(7.23)	(12.12)	(34.73)	(29.14)	(12.82)	(3.96)	-	-	(100)
11-	Hyderabad (Absolute)	4	50	223	105	17	4	1	0	404
	(Percentage)	(0.99)	(12.38)	(55.20)	(25.99)	(4.21)	(0.99)	(0.25)		(100)
12-	Peshawar (Absolute)	30	55	140	103	44	17	2	4	395
	(Percentage)	(7.59)	(13.92)	(35.44)	(26.09)	(11.14)	(4.30)	(0.51)	(1.02)	(100)

Table 8 - Frequency Distribution of Differences Between Weekly wholesale prices of wheat at Rawalpindi Terminal Market and some important primary wholesale Markets of Pakistan (January 1961 - December 1970)

Price-Differences (in Rupees) (Markets)	FREQUENCY TABLE (Minus) Upto -1.50	-1.50to +0.00	+0.00to +1.50	+1.50to +3.00	+3.00to +4.50	+4.50to +6.00	+6.00to +7.50	+7.50& above	Total No. of weeks
1. Lahore (Absolute)	54	152	101	67	8	0	0	0	382
(Percentage)	(14.14)	(39.79)	(26.44)	(17.54)	(2.10)	-	-	-	(100)
2. Lyallpur (Absolute)	55	139	123	67	3	3	0	0	390
(Percentage)	(14.10)	(35.64)	(31.54)	(17.18)	(0.77)	(0.77)	-	-	(100)
3. Multan (Absolute)	18	66	112	119	16	4	0	0	335
(Percentage)	(5.37)	(19.70)	(33.43)	(35.52)	(4.78)	(1.19)	-	-	(100)
4. Sahiwal (Absolute)	47	95	128	103	20	1	0	0	394
(Percentage)	(11.93)	(24.11)	(32.94)	(26.14)	(5.08)	(0.25)	-	-	(100)
5. Okara (Absolute)	34	89	131	97	16	2	0	0	369
(Percentage)	(9.21)	(24.12)	(35.50)	(26.29)	(4.34)	0.54)	-	-	(100)
6. Gujranwala (Absolute)	70	103	99	50	6	1	0	0	329
(Percentage)	(21.28)	(31.31)	(30.09)	(15.20)	(1.82)	(0.30)	-	-	(100)
7. Jaranwala (Absolute)	14	83	108	86	31	6	0	0	328
(Percentage)	(4.27)	(25.30)	(32.93)	(26.22)	(9.45)	(1.83)	-	-	(100)
8. Sargodha (Absolute)	24	90	147	121	15	7	0	0	404
(Percentage)	(5.94)	(22.28)	(36.39)	(29.95)	(3.71)	(1.73)	-	-	(100)
9. Sheikhupura (Absolute)	69	108	136	54	20	3	0	0	390
(Percentage)	(17.69)	(27.69)	(34.87)	(13.85)	(5.13)	(0.77)	-	-	(100)
10. Sialkot (Absolute)	43	104	133	69	27	3	0	0	379
(Percentage)	(11.35)	(27.44)	(35.09)	(18.21)	(7.13)	(0.79)	-	-	(100)
11. Hyderabad (Absolute)	47	95	134	66	19	1	0	0	362
(Percentage)	(12.98)	(26.24)	(37.02)	(18.23)	(5.25)	(0.28)	-	-	(100)
12. Peshawar (Absolute)	40	199	131	55	12	2	1	1	361
(Percentage)	(11.08)	(32.96)	(36.29)	(15.24)	(3.32)	(0.55)	(0.28)	(0.28)	(100)

Source: Computation based on data taken from [67].

Major component of such costs are the transpot cost, however, there are many other costs which a trader has to bear for moving the produce from one market to the others. There are some handling charges which he incurs as buyer in a primary markets and other which he bears as seller in the terminal markets. I have shown all these costs separately again there are some costs which he pays as a percentage of the total produce and the other which are paid on per maund basis. In this way to convert those percentage to per maund basis I have assumed that during the period of our study the average wheat price is Rs.20.00.[13] Then by taking all these costs component together I have estimated the total shipment costs from each primary market to the terminal markets of Karachi and Rawalpindi. They are presented in Table 9.

This table shows that total shipment costs from Lahore to Karachi are Rs.4.41. From other markets these costs are: Lyallpur Rs. 4.60, Multan Rs.3.60, Sahiwal Rs.4.02, Gujranwala Rs. 4.58, Okara Rs.4.02, Jaranwala Rs. 4.58, Sialkot Rs. 4.70, Sargodha Rs. 4.92, Sheikhupura Rs. 4.58, Hyderabad Rs. 2.30 and Peshawar Rs. 6.00. Now when we compare these costs with the price-differential between these two kinds of markets given in Table 7 and 8 we find that the price differentials have remained well below the transhipment costs. They have remained even negative for all the markets for some time. For Lahore and Sheikhupura as much as 28% of the time they have remained negative. Even when they were positive they remained most of the time below Rs. 3.00 per maund which is not enough to bear the costs of shipment. For the rest of the time, they remained between

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[13] We have made this assumption after observing the actual price data from 1961-70.

Table 9 - Estimate of Costs on shipment of Wheat from primary wholesale markets to the terminal markets of Karachi and Rawalpindi at 1967-68 rate.

	Components of Costs	Lahore	Lyallpur	Multan	Sahiwal	Gujranwala
		1	2	3	4	5
1.	Commission at Primary Mk.	1.56%	1.56%	1.56%	1.56%	1.56%
2.	Market Fee	0.05%	0.05%	0.05%	0.05%	0.05%
3.	Portage to Carrier	0.06	0.06	0.06	0.05	0.05
4.	Loading	0.06	0.06	0.06	0.05	0.05
5.	Sewing and Heardling of bags	0.04	0.04	0.04	0.04	0.04
6.	Total Costs as buyer	0.16	0.16	0.16	0.14	0.14
	(1+2+3+4+5)	+ 1.61%	1.61%	1.61%	1.61%	1.61%
7.	(a) Transport Cost to Rawalpindi(by truck)	1.25	1.69	2.00	1.81	1.12
	(b) Transport Cost to Karachi (by truck)	2.93	3.12	2.12	2.56	3.12
8.	Octrio	0.06	0.06	0.06	0.06	0.06
9.	Unloading (in terminal market)	0.06	0.06	0.06	0.06	0.06
10.	Cartage (in terminal market)	0.10	0.10	0.10	0.10	0.10
11.	Waightment (")	0.06	0.06	0.06	0.06	0.06
12.	Commission at terminal Mkt.	1.56%	1.56%	1.56%	1.56%	1.56%
13.	Depreciation of bag	0.20	0.20	0.20	0.20	0.20
14.	Other Costs Minor Labour Costs, on the may losses, etc.	0.20	0.20	0.20	0.20	0.20
15.	Total costs as seller (for Karachi) (8+9+10+11+7(b)+12+13+14)	3.62 + 1.56%	3.80 + 1.56%	2.80 + 1.56%	3.24 + 1.56%	3.80 + 1.56%
16.	Total Costs as seller (for Rawalpindi)	1.93	2.37	2.68	2.49	1.30
	(7(a)+8+9+10+12+13+14)	+ 1.56%	+ 1.56%	+ 1.56%	+ 1.56	+ 1.56%
17.	Total Shipment costs (for Karachi)(15+6)	3.77	3.96	2.96	3.33	3.94
*17.b	Assuming wheat price = Rs.20 =	+ 3.17% (441)	+ 3.17% (4.60)	+ 3.17% (300)	+ 3.17% (4.02)	+ 3.17% (4.58)
18.	Total Cost including (for Rawalpindi) Total =	2.09 +3.17% (2.73)	+2.53 +3.17% (3.17)	+2.84 +3.17% (3.48)	+2.63 +3.17% (3.27)	+1.94 +3.17% (2.58)

Table 9 (Cont'd..)

(In Rupees per maund)[1]

	Okara	Jaranwala	Sargodha	Sheikhupura	Sialkot	Hyderabad	Peshawar
	6	7	8	9	10	11	12
1.	1.56%	1.56%	1.56%	1.56%	1.56%	1.56%	1.56%
2.	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
3.	0.05	0.05	0.06	0.05	0.05	0.06	0.06
4.	0.05	0.05	0.05	0.06	0.05	0.06	0.06
5.	0.04	0.04	0.04	0.04	0.04	0.04	0.04
6.	0.14	0.14	0.16	0.14	0.14	0.16	0.16
	1.61%	1.61%	1.61%	1.61%	1.61%	1.61%	1.61%
7.	1.69	1.75	1.44	1.25	1.25	2.87	1.00
	2.56	3.12	3.44	3.12	3.25	0.90	4.62
8.	0.06	0.06	0.06	0.06	0.06	0.06	0.06
9.	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.	0.10	0.10	0.10	0.10	0.10	0.10	0.10
11.	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.	1.56%	1.56%	1.56%	1.56%	1.56%	1.56%	1.56%
13.	0.20	0.20	0.20	0.20	0.20	0.20	0.20
14.	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.	3.24 +1.56%	3.80 +1.56%	4.12 +1.56%	3.80 +1.56%	3.93 +1.56%	1.58 +1.56%	5.30 +1.56%
16.	2.37 +1.56%	2.43 +1.56%	2.12 +1.56%	3.80 +1.56%	3.93 +1.56%	1.58 +1.56%	5.30 +1.56%
17.	3.33	3.84	4.28	3.94	4.97	1.74	5.46
*17.b	+3.17% (4.02)	+3.17% (4.58)	+3.17% (4.92)	+3.17% (4.58)	+3.17% (4.70)	+3.17% (2.38)	+3.17% (6.10)
18.	2.51 +3.17% (3.15)	2.57 +3.17% (3.21)	2.28 +3.17% (2.90)	2.07 +3.17% (2.01)	2.07 +3.17% (2.71)	3.71 +3.17% (4.35)	1.84 +3.17% (2.48)

* Bracketed figures represent total costs of shipment of one maund of wheat, from different primary markets to the Terminal markets.

Rs. 3.00 and Rs. 4.50 just enough to cover the shipment costs. The price differences above 4.50 which means excessive profit to the traders have existed for a very small period.

Comparing the individual markets, the price differences have remained more in line with the costs particularly in case of Lahore and Lyallpur markets. This is attributed mainly to the comparatively better transportation facilities available from these cities. Since both of these cities are among the biggest industrial centres of the country, they have the best possible rail and road links with Karachi and other parts of the country. This shows a positive correlation between the competitiveness of the markets and the transportation facilities. Another proof of this is the markets of Jaranwala, Sargodha and Sialkot. Since all these markets are located on branch railway lines and at distant places from the main roads more frequencies are placed in higher limite of the price-differentials in the case of these markets.

As regards Peshawar market , the price differentials are more evenly distributed, implying a lower degree of its relationship with terminal as well as primary markets.

Let us now take the case of the Rawalpindi terminal markets. Price differentials between this and the other markets have been negative for some time and positive for most of the time. There is however one notable point about the positive price differentials in the case of this market. A very high percentage of price differential lies between Rs.1.50 to Rs.3.00 (17.5% in the case of Lahore 19.2% for Sialkot, 26.22% for Jaranwala and 35.52% for Multan).

This shows that the traders had the chances to earn abnormal profit even during this period, because the transhipment costs to Rawalpindi from most of the markets have been arround Rs.2.50.

Similarly for a considerable number of times price-differential was above Rs.3.00, a limit beyond which opportunities for earning excessive profit existed. This is not the case with Karachi market where most of the time price-difference has remained well below the transfer costs. This once again shows a comparatively more competitive nature of the Karachi market than of the Rawalpindi. In general this comparison of the price-differentials and the transshipment costs shows quite a high degree of pricing efficiency in our markets.

(3) Inter-Termporal Price Differential

To analyse this aspect of pricing efficiency, the usual procedure is to compare the prices at both ends of the assumed storage period after discounting the end price by the estimated storage costs. The correct identification and quantification of the actual storage costs as well as delineation of the storage period are the crucial aspects of this analysis. To define exactly the period of wheat storage is very difficult in the case of Pakistan. Since it requires the knowledge of monthly stocks of the traders which very from years to year depending on the production and consumption position of the country, it is very hard to get such knowledge from any source at present. Traders never reveal correct information about their stock position. To overcome this problem I have assumed that the traders complete their purchases within two to three months of the postharvest period and then come out with their stocks two to three months before the next crop.

The period between these two points has been considered as the storage period. Accordingly I have taken average of May and June prices as the harvest price the price on which traders purchase for stocks) and average of January, February and March prices as the offseason price. The storage period in this way comes out to about eight months.

Storage costs, on the other hand have been estimated by taking into account four major components of such costs. They are: 1. the costs of rent of the warehouses 2. shadow inerest rate, i.e. the amount a traders has to pay to the bank for the money he may take as loan for stocking wheat, or in case of his own capital, the amount he would have earned by investing it somewhere else. I have taken such a rate as equal to the rate of interest charged by commercial banks on short term loans to simplify the estimates; 3. depreciation of bag in which wheat is to be stored and 4. losses during the storage process. However, I have not included qualitative losses, as they were difficult to estimate properly. Thus the estimated storage cost per maund of wheat are given in table 10 for the period 1960-71.

In Table 11, I have presented the estimates of seasonal variation in price and gross profit rate earned by the stock-holders from the storage process. The methods used for estimating these variables are as below:

1. $V_s = \frac{P_o - P_h}{P_h} \cdot 100$

2. $M_g = P_o - (P_h - S_c)$

3. $m_g = \frac{M_g}{(P_h + S_c)} \cdot 100$

where

V_s = Seasonal variation in Price as % of the harvest price (P_h)

P_o = Off-seasonal Price

M^o = Gross Profit margins

m^g_g = Rate of Gross Profit margins

and S_c = Storage Costs.

Table - 10

Storage Costs Per Maund of Wheat (1960-71) Components of Storage Costs.(13)

Year	Cost of Rent	Shadow interest rate	Depare-ciation of bag	Loss in storage	Total storage cost
1960-61	0.48	0.70	0.40	0.38	1.96
1961-62	0.48	0.70	0.40	0.38	1.96
1962-63	0.48	0.63	0.40	0.35	1.86
1963-64	0.56	0.73	0.40	0.35	2.04
1964-65	0.56	0.71	0.45	0.38	2.10
1965-66	0.56	0.80	0.45	0.38	2.24
1966-67	0.64	0.83	0.45	0.40	2.32
1967-68	0.64	1.14	0.45	0.53	2.76
1968-69	0.64	0.92	0.50	0.45	2.51
1969-70	0.72	0.87	0.50	0.43	2.52
1970-71	0.72	1.07	0.50	0.45	2.74

Source: Interviews of the Traders.

(13) Each compenent of the storage costs is estimated on the basis of average harvest price for each year.

Table 11 - Seasonal Variations and An Estimated Gross Rate of Margins from wheat Storage (An average of 10 Primary Markets) from 1960-71.

Year	Off-seasonal rise in Price as % of the Harvest Price	Absolute Gross Profit (in Rs.)	Gross Profit as % of Total investment
1960-61	19.80	1.02	5.99
1961-62	5.48	-1.12	-6.63
1962-63	11.97	-0.24	-1.40
1963-64	23.68	1.68	9.73
1964-65	19.90	0.90	5.53
1965-66	7.63	-1.13	-6.34
*1966-67	104.94	14.14	78.84
1967-68	0.51	-9.75	-11.39
1968-69	9.62	-0.85	-4.16
1969-70	19.18	0.56	3.25
1970-71	7.74	-1.39	-6.54
Average =	21.13	0.99	6.08

Computation based on Average weekly wholesale Price from/ 6 / and table : 10.

(1) See Appendix (A) For the individual market

/* This was an abnormal year due to war and drought (Also see the text).

The estimates given in table 11 are an average of about 10 primary markets. Since it was difficult to show such estimates relating to each market in the text I have given them in the Appendix (A) of this paper. From this table, we can observe that seasonal variations in prices have remained generally low, thus allowing a very nominal profits to the traders from storage operation. They have remained below 10% for five out of 11 years and below 25% for 10 out of 11 years. As a result for 6 out of 11 years gross profit rate has been negative. Even for those for which the profit is positive it has remained very low except for the year 1966-67. In fact this was an abnormal year in the marketing history of Pakistan. There was exceptionally low production in this and the year proceding to this because of 1965 War with India and drought following it. This created uncertainty about supply and demand condition in this country. Consequently, prices moved up and down so abruptly that no degree of competitiveness could have presented these variations from taking place. This enabled the traders to earn wind-fall profits from wheat storage during this year.

We may point out here that our method shown above, of relating profit margin with the seasonal variations is not necessarily to be supported by the real world situation. Without having the knowledge of the actual stock position and the profits earned by the traders, which is extremely difficult to get at present, we can not draw any final conclusion about the market's position in this respect. However, we should be very clear that the traders attitude towards

stock-taking and storage operation is a very complex phenomenon. There is no generalisation about when a trader will take on stock and sell it again. It is also not known what costs does he incur on such operation. The main reason for lack of information on this aspect is the absence of regulated and proper storage facilities. Neither government nor private investors have shown much of their interests in providing this kind of facility uptill now.

As a result we have to be very careful in using our results on this aspects.

V. CONCLUSIONS AND POLICY IMPLICATIONS

The main objectives of our study were to test various hypothesis regarding the competitiveness of the agricultural markets in Pakistan and to identify those factors which might have caused gross imperfactions in that system.

The above tasks was accomplished first, by direct observation of the market-structure used for marketing of wheat. This was necessary to check the validity of the prevailing impression that this structure is oligopolistic in nature and not cometitive. As for as our investigation goes, it does not confirm the prevailing impression. A large number of traders operating in each market, virtually free entry and exit condition and competition among the traders in getting orders from outside markets are the factors which indicate the competitive nature of this market structure. However, some imperfections were observed in the dissemination of knowledge to traders and cultivators. This requires proper use of the existing media of

information like radio and T.V. and a reliable communication network, which only government can provide in this country. Scope also exists for private firms which can help in spreading market information both to the traders and cultivators.

Our hypothesis is further confirmed by the empirical tests which we used in this study. They demonstrate a high degree of market integration among all the primary markets, as well as between the Karachi terminal market and the important primary markets, This is supported both by high values of 'r' and inter-market price differential being less than transshipment costs for most of the time. Rawalpindi terminal market is an exception to this. Therefore steps should be taken to increase marketing facilities in this market. An improved transportation system should be made available for all the primary markets exporting wheat to this city. In the short-run this can be done by assigning more railway care for this market so that the traders have not to depend on trucks for most of the time as they do at present, and in the long-run by setting direct rail and road routes to this city. Special arrangements should also be made for increasing transportation facilities for all the export-markets during the harvest season when there is a glut of grains in these markets.

Again, our estimates of seasonal variation also do not confirm the existing view that the traders earn undue profit from the storage operation. However a further investigation is required to strengten the validity of these estimates, which can be done if the knowledge about the actual stock position of the individual traders and the profit margin earned by them is available.

Some other policy implications of our study are as follow:

1. The system of market-regulation should also be extended to those areas where presently it has not made any major stride. Particularly the village traders who are not registered at present, should be asked todo so. They should also be required to keep a systematic record of prices and their transactions.

2. Market regulation should be made strict with respect to stock-position and profit-loss statement of the traders in primary as well as in the terminal markets.

3. To control seasonal variations in prices government should provide storage facilities to the farmers in the rural areas exactly on those lines on which it provides other agricultural facilities like better and cheap seeds, subsidised fertilizers and so on.

In short, our study expects more favourable results if the policy of giving incentives to the traders and the cultivators is adopted and do not find the replacement of the existing system by a government organization an economically rational policy.

REFERENCES

1. Farruk, Osman. Marketing of Rice in East Pakistan. Ithaca: Cornell University Press, 1971.

2. Jones, O.W. "Measuring the Effectiveness of Agricultural Marketing in Contributing to Economic Development: Some African Examples". Food Research Institute Studies. Vol.IX, No.3, 1970.

3. Khan, R.A. An Investigation into the Working and Achievements of the Regulated Markets. (M.Sc. Thesis). Lahore: University of the Punjab.

4. Lele, U.J. Food Grain Marketing in India: Private Performance and Public Policy. Ithaca: Cornell University Press, 1971.

5. Pakistan. Food and Agricultural Division (Planning Unit). Yearbook of Agricultural Statistics (Supplement) 1973.

6. Pakistan. Agricultural Marketing Advisor. Markets and Prices (various issues).

7. Pakistan (West). Planning and Development Board. Development Statistics of West Pakistan, 1972.

8. Qureshi, Sarfraz K. "The Performance of Village Markets for Agricultural Produce: A Case Study of Pakistan". Pakistan Development Review. Vol.XIII, No.3, Autumn 1974: 280-307.

9. Rashid, A. The Marketing of Wheat in West Pakistan. Lyallpur: West Pakistan Agricultural University, 1971.

10. _____. The State of Agricultural Marketing in Pakistan. Lyallpur: West Pakistan Agricultural University, 1970.

11. Smith, G.W. "Marketing and Economic Development : A Brazilian Case Study 1930-70". Food Research Institute Studies. Vol.XII, No.3, 1973.

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APPENDEX - (A)

(1) Estimates of Seasonal Variations and Gross Rates of Profit in storing one maund of Wheat in various primary markets of Pakistan

From 1960 -71 (in Rs. per maund)

Year	LAHORE			LYALLPUR			MULTAN		
	Seasonal variations as % of harvest	Cross Profit margins (Absolute)	Gross Rate of profit on total investment						
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1960-61	21.58	1.35	7.80	17.72	0.73	4.26	30.92	2.26	14.48
61-62	7.81	-0.79	-4.66	3.43	-1.43	-8.22	7.21	-0.93	-5.72
62-63	14.47	0.07	0.46	5.93	-1.00	-6.11	0.84	-1.74	-10.73
63-64	-	-	-	29.75	2.28	13.17	34.75	2.28	15.76
64-65	18.93	0.84	4.76	15.59	.35	1.96	-	-	-
65-66	8.43	-0.96	-5.51	3.44	-1.71	-9.68	-4.41	-2.98	-15.67
66-67	112.83	15.97	86.18	140.51	20.33	100.25	132.70	17.75	102.13
67-68	1.23	-2.48	-9.73	2.54	-2.21	-9.05	-0.10	-2.78	11.73
68-69	10.65	-0.51	-2.40	5.16	-1.53	-7.12	21.69	0.86	4.76
69-70	12.64	-0.22	-1.06	14.09	- .18	-0.94	21.23	0.87	4.71
70-71	11.45	-0.69	-3.34	3.16	-2.17	-10.45	8.89	-1.21	-6.06
Average	22.00	1.26	7.25	21.94	1.22	7.10	25.37	1.44	9.19

Estimates of Seasonal variations and Gross Rates of Profit in storing one maund of of wheat in various primary markets of Pakistan.

From 1960-71 (in Rs. per maund)

	(1)	(2) SAHIWAL	(3)	(1)	(2) GUJRANWALA	(3)	(1)	(3) SARGODHA	(3)
1960-61	25.92	1.83	11.04	22.07	1.48	8.43	15.59	0.35	2.08
61-62	7.13	-0.96	-5.71	4.03	-1.33	-7.57	5.15	-1.20	-7.17
62-63	13.55	-0.11	-0.74	-	-	-	9.63	-0.53	-3,38
63-64	37.62	2.99	19.40	17.99	0.71	4.12	18.96	0.72	4.34
64-65	23.65	1.53	8.70	-	-	-	23.59	1.46	8.49
65-66	3.71	-1.76	-10.12	-	-	-	-1.85	-2.52	-14.52
66-67	120.73	16.14	91.65	-	-	-	133.20	17.62	101.91
67-68	-	-	-	-	-	-	1.38	-2.47	-10.36
68-69	8.63	-0.97	-4.91	-	-	-	6.76	-1.31	-6.47
69-70	18.19	0.25	1.41	-	-	-	17.87	0.33	1.79
70-71	-	-	-	-	-	-	8.83	-1.24	-6.28
Averages	28.79	2.10	12.31	14.70	0.29	1.66	21.72	1.02	6.40

Source:- Computations based on monthly price data taken from [6]

(1) Methods of estimating these figures are given in the text.

	SIALKOT			SHEIKHUPURA			HYDERABAD		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1960-61	17.77	0.85	4.78	19.82	1.10	6.32	16.49	.60	3.43
61-62	2.24	-1.61	-9.16	5.17	-1.10	-6.46	2.78	-1.53	-8.77
62-63	11.79	-0.21	-1.32	20.16	0.73	4.96	21.59	1.04	6.80
63-64	27.49	1.85	11.43	30.69	2.41	14.57	15.66	.28	1.66
64-65	21.12	1.17	6.84	21.14	1.25	6.99	8.20	-.85	-4.90
65-66	15.52	-0.03	-.18	19.36	0.61	-4.62	16.51	.15	.90
66-67	109.51	15.19	82.96	102.52	13.12	74.49	65.56	9.13	48.00
67-68	30.66	-3.49	-10.68	9.44	0.85	-3.70	2.86	-2.15	-8.92
68-69	11.22	-0.63	-3.27	9.22	-0.86	-4.22	9.52	-0.33	-4.12
69-70	32.05	2.49	13.72	7.03	-1.17	-5.53	30.36	2.11	11.87
70-71	8.66	-1.15	-5.45	3.39	-2.09	-9.53	5.14	-1.79	-8.43
Average	23.06	1.31	8.15	21.64	1.07	6.75	17.70	0.56	9.41

	PESHAWAR		
	(1)	(2)	(3)
1960-61	10.12	-0.49	-2.84
61-62	9.80	-0.49	-2.89
62-63	9.81	-0.46	-2.85
63-64	18.23	0.58	3.53
64-65	26.88	1.91	11.22
65-66	17.96	.39	2.31
66-67	26.90	2.04	11.01
67-68	9.62	-5.05	-19.01
68-69	3.69	-1.87	-9.42
69-70	-	-	-
70-71	12.41	.57	-2.82
Average	12.62	-6.23	-1.68

Sources: Computations based on data taken from [6]

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