

## Domestic Terms of Trade and Public Policy for Agriculture in Pakistan

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Despite the crucial importance of information on intersectoral terms of trade in the formulation of a host of public policies, the official statistical system in Pakistan is yet to generate a statistical series of the terms of trade for the agricultural sector on a regular basis. A number of views expressed on Pakistan's agriculture appear to be based either on results of studies that are now outdated, or on a complete neglect of the existing data that could be processed to calculate the terms-of-trade indices. This paper attempts to provide information on the movement of terms of trade for the agricultural sector for the period from 1951-52 to 1983-84. The impact of changes in terms of trade on farm output, distribution of income and efficient use of resources is also traced.

### BRIEF REVIEW OF PREVIOUS STUDIES

A number of studies have been conducted in Pakistan about movements in the terms of trade for the agricultural sector [2; 3; 7; 9; 10]. Since there are considerable methodological differences, it would be useful to have a brief look at each study. The studies referred to above belong to two distinct types : (a) those which examine the movements in intersectoral terms of trade by computing implicit price indices from the national accounts data; and (b) those which evolve a set of weights for the different items traded between the agricultural and non-agricultural sectors. The study by Cheong and D'Silva [2] is of the first type while all the remaining studies belong to the second type.

Studies of the first type are not very demanding where basic data are concerned. Published national accounts data and/or published indices of wholesale

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prices for agricultural and industrial goods are used to determine the trends in the terms of trade. Cheong and D'Silva have computed the terms-of-trade indices by using the estimates of GDP at factor costs in current prices originating in the agricultural and manufacturing sectors and their corresponding estimates at constant prices.<sup>1</sup> The terms-of-trade indices estimated from GDP deflators suffer from serious limitations. The weights attached to different commodities are on the basis of production and not on the basis of the marketed quantities, i.e. the intersectoral sales and purchases. Furthermore, the commodities included in the analysis are not the ones actually traded between the agricultural and non-agricultural sectors but are inclusive of many commodities which are in fact not traded between the two sectors. On these grounds, the findings regarding the terms of trade may be biased and may not reflect the real trends in relative prices.

Studies belonging to the second type attempt to rectify the limitations inherent in the study by Cheong and D'Silva. The pattern of trade is identified to include most of the major products and weights are estimated on the basis of the best available information regarding the sales and purchases of a sector for which terms of trade are computed. The studies by Lewis and Hussain [10], Lewis [9], and Gotsch and Brown [3] are identical in respect of the selection of commodities, the choice of weights and the use of prices. The study by Kazi [7] uses the same concept of prices but differs not only in the way the weights are assigned to different commodities but also in the coverage of commodities in the intersectoral trade.

The commodity coverage of the indices of the prices paid, as computed by Lewis, was spread over three functional groups of consumption goods, intermediate and related goods, and investment and related goods. The numbers of the items in the groups identified above were 14, 7 and 6, respectively. Since no information on intersectoral trade was available, Lewis estimated the value of intersectoral transactions through an indirect method. He derived the value of intersectoral transactions by estimating the availability of different commodities. These were then apportioned between the two sectors on the basis of different assumptions about the absorption of different commodities in the two sectors. The net availability was defined as domestic supply plus imports minus exports. The absorption of consumption goods in the agricultural and non-agricultural sectors was determined by different assumptions about the consumption patterns of agricultural and non-agricultural populations. The alternative assumptions were equal per capita expenditure and 10 percent, 25 percent and 40 percent less expenditure on non-agricultural consumption goods in the rural areas than in the urban areas. A smaller share was allocated to the agricultural sector for the intermediate and investment goods

<sup>1</sup>The net barter terms of trade of the agriculture sector are computed by dividing the GDP deflator for the agricultural sector by the GDP deflator for the manufacturing sector.

because the bulk of such goods was assumed to be absorbed in the urban industrial sector and in public projects.

The weights computed by Lewis were based on estimated production, sales and purchases for the year 1959-60. All terms-of-trade indices are thus representative of the trends of the relative prices of the bundles of goods transacted in 1959-60. Lewis computed the terms-of-trade indices on the basis of a number of alternative weighting schemes and found that the results were robust and the basic trends were insensitive to substantial variations in the weights.<sup>2</sup>

Kazi [7] finds three problems with Lewis's method of analysis. Firstly, she argues that Lewis's weighting scheme was based on arbitrary assumptions about the absorption of goods in different sectors. Secondly, she objects to the inclusion of some investment and investment-related goods on the ground that they are unlikely items for purchase by agriculture. Thirdly, she points out that Lewis ignores such items purchased by agriculture from the non-agricultural sector as are not produced by the large-scale industrial sector. Expenditures on gas and electricity are cited by her in this context.

Before we examine the contribution made by Kazi, it must be pointed out that she has correctly identified the problems with Lewis's analysis but has not dealt with these problems very adequately. Using data on consumer expenditure from the Household Income and Expenditure Survey and the National Accounts data on the value of production of some agricultural and non-agricultural intermediate goods, Kazi estimates the weights for different items for 1969-70. Like Lewis, she uses index numbers of wholesale prices as price indicators.

Derivation of weights on the basis of consumer expenditure creates a bias, as has been shown in the case of India by Kahlon and Tyagi [6]. Such data are based on retail prices. The weights derived on the basis of final consumption estimates tend to over-estimate the share of those commodities in whose case the difference between the retail and wholesale prices is large.

Kazi also faults when she ignores items of capital formation which were included, though in a crude manner, by Lewis in his computations. Since investment goods

<sup>2</sup>The robustness found by Lewis for his method of analysis also obtains for the extended period of analysis to 1983-84. For details, the reader is referred to a study by Qureshi and Siddiqui, [15]. For a ready reference on this point, in the case of two alternative weighting schemes, the reader may see Table 1. It would be extremely useful to extend the analysis using a recent year's pattern of intersectoral sales and purchases as weights for the terms of trade. Unavailability of basic data is the main factor explaining our decision not to pursue the ideal course but to stick to Lewis's weights. The assumption that rural per capita expenditure on most commodities is 25 percent less than the urban per capita expenditure is supported by the evidence for 1979 from the Household Income and Expenditure Survey. However, the important point to remember is that a wide variation in the weighting scheme does not change the pattern of movement of terms of trade for the agricultural sector.

are becoming increasingly important in the modernization of agriculture, this omission is a serious one. The coverage of commodities for final use by agriculture was also narrower in Kazi's study. We are interested in the computation of terms of trade of agriculture with a view to getting an idea of the changing domestic incentives for the sector, and to analysing the impact that such incentives have on agricultural economy. Inclusion of a large number of items for final consumption, intermediate use and capital formation in the indices of the prices paid indices is an absolute necessity. Since Lewis has an edge in this regard and his method of analysis was found to be robust to a wide variation in weights, in the next section we use the weights constructed by him for 1959-60, so as to be able to trace the movements in relative prices for the agricultural sector for the period from 1951-52 to 1983-84.

### MOVEMENTS IN AGRICULTURE'S TERMS OF TRADE

The terms of trade for agriculture relative to those for the industrial sector are an indicator of the profitability of agriculture and of the purchasing power of agricultural income. The intersectoral terms of trade are determined jointly by (a) changes in the supply of and demand for goods and services entering in the intersectoral trade, (b) changes in a whole array of macro policies in areas of taxation, trade and monetary economics, and (c) commodity-specific incentive price policies. In this section, we present information on trends in the domestic terms of trade and give a brief account of the factors that may have influenced the rural-urban terms of trade.

There are many different concepts of the terms of trade. Table 1 presents information on three types of the terms of trade.<sup>3</sup> All numbers are three-year moving averages that attempt to smooth the series from yearly fluctuations. Net barter terms of trade are measured in two alternative ways. For the prices paid by agriculture, estimated purchases are used in both the alternatives. For the prices received by agriculture, alternative weights are based on marketings and gross output of different agricultural goods. The use of different weights changes the magnitude of movements but does not alter the general pattern of the movements in the terms of trade.

Five distinct periods in the movements in net barter terms of trade can be distinguished.<sup>4</sup> The first period from the year 1951-53 to the years 1954-57 was that of deterioration in the terms of trade when these terms declined by about 9 percent. The partition of the Indo-Pak sub-continent in 1947 had disrupted the pattern of trade of agricultural and manufactured goods. The areas that constituted Pakistan

<sup>3</sup>This table is extracted from an earlier study by Qureshi and Siddiqui [15]. The reader is referred to that study for details regarding the method of analysis.

<sup>4</sup>For a detailed analysis, see [3; 8; 9; 10].

Table 1

#### Terms of Trade for Agriculture Three-year Moving Average: 1951-52 - 1983-84

Years	Net Barter Terms of Trade		Income Terms of Trade	Single Factoral Terms of Trade	Ratio of Prices Received Relative to Prices Paid by the Agricultural Sector for				Prices of Food Crops Relative to Cash Crops	Index of Agricultural Output (Base year: 1959-60)
	Alternative 1	Alternative 2			Consumption Goods	Intermediate Goods	Investment Goods	Investment Goods		
1	2	3	4	5	6	7	8	9	10	
1951-54	99.34	96.64	83.60	109.21	100.30	99.75	90.85	87.16	87.00	
1952-55	91.60	91.59	81.86	102.07	90.78	95.62	92.93	94.88	89.67	
1953-56	90.12	87.97	79.42	96.55	89.70	92.73	94.65	87.02	90.33	
1954-57	94.16	91.17	82.78	95.83	96.08	92.12	92.74	84.62	90.67	
1955-58	98.56	95.14	87.34	96.83	101.75	93.83	93.90	87.41	91.67	
1956-59	100.64	98.16	92.25	97.18	104.63	97.29	95.45	92.22	94.00	
1957-60	100.88	99.37	94.74	98.56	103.29	99.46	98.61	96.01	95.33	
1958-61	103.44	103.11	102.44	99.39	105.23	102.21	104.06	98.43	99.33	
1959-62	106.11	105.71	111.73	101.02	106.98	105.13	106.24	96.98	105.67	
1960-63	107.99	106.80	116.60	102.20	109.66	106.66	105.39	93.44	109.33	
1961-64	106.91	105.37	120.49	104.04	108.82	104.41	100.79	95.41	114.33	
1962-65	105.93	106.98	126.40	107.58	109.14	104.34	98.00	96.44	118.00	
1963-66	104.55	108.43	133.74	108.60	107.94	103.76	96.49	97.11	123.33	
1964-67	104.46	113.60	146.01	115.47	107.51	105.71	96.11	106.33	128.33	

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	Alternative 1	Alternative 2			Consumption Goods	Intermediate Goods	Investment Goods		
1	2	3	4	5	6	7	8	9	10
1965-68	101.69	113.78	158.98	121.63	105.12	103.44	90.57	124.69	139.67
1966-69	99.37	113.02	172.41	128.09	103.99	100.50	85.11	137.00	153.33
1967-70	96.61	109.33	186.16	138.25	103.13	96.26	78.63	136.25	170.33
1968-71	97.74	108.56	191.44	141.84	106.26	95.85	76.54	126.31	176.00
1969-72	99.42	110.38	199.79	146.46	109.05	96.07	77.67	123.56	181.00
1970-73	102.38	112.26	204.05	147.03	112.10	99.30	80.34	120.73	181.67
1971-74	108.67	118.56	224.50	156.33	117.52	109.52	83.81	121.16	189.00
1972-75	109.72	121.17	230.84	156.79	117.96	119.59	77.48	127.64	190.33
1973-76	106.98	118.04	228.86	151.58	114.46	120.55	72.22	129.42	194.00
1974-77	108.84	114.77	225.23	145.85	108.92	124.77	68.71	126.06	196.33
1975-78	109.23	119.54	243.90	153.95	111.54	134.26	76.33	123.45	203.66
1976-79	111.69	119.12	257.38	150.96	113.65	140.11	75.56	118.90	210.33
1977-80	105.57	115.84	255.86	145.01	111.99	123.84	71.86	121.94	222.33
1978-81	95.87	103.98	244.03	131.87	108.20	100.01	63.86	117.53	235.66
1979-82	91.45	99.82	247.60	136.56	107.09	86.30	62.36	121.44	248.00

Continued –

Table 1 – (Continued)

1980-83	92.36	99.41	256.81	134.69	107.60	84.22	66.07	83.15	258.38
1981-84	95.42	102.59	277.65	136.99	108.23	88.29	72.06	119.07	270.33

- Notes: 1. Weights for prices received by the agricultural sector are the marketings and gross value of output of each of the commodities for Alternative 1 and Alternative 2 respectively. Weights for prices paid by the sector are estimated purchases of non-agricultural commodities by the agricultural sector. The absorption of consumption is determined on the assumption that per capita consumption in agriculture is 25 percent less than that in the non-agricultural sector. For the years from 1951-54 to 1961-64, data series have been taken from Lewis and Mushtaq [10]. For the remaining years, the series were updated with the use of the Lewis-Mushtaq methodology.
2. Income terms of trade were obtained by multiplying net barter terms of trade (Alternative 1) with an index of agricultural output. The index of agricultural output is published by the Federal Bureau of Statistics in its *Monthly Statistical Bulletins*.
3. Single Factoral terms of trade were obtained by multiplying net barter terms of trade (Alternative 1) by the Factor Productivity Index. The productivity index is taken from Wizarat [17]. An aggregate input index was calculated by weighting the labour index, livestock index and land index. The productivity index is obtained by dividing the weighted input index by the index of the value added in agriculture.
4. Weights for the prices received and the prices paid are the same as given in Note (1) above for net barter terms of trade (Alternative 1).
5. Weights for agricultural prices are the marketings of each of the commodities. Food crops consist of Rice, Wheat, Maize, Barley, Sorghum, Pulses, Potatoes and Onions whereas cash crops consist of Oilseeds, Cotton, Sugar-cane and Tobacco.

had a surplus in agricultural goods and had been exchanging these goods for manufactured goods from areas that became India. A relative glut of agricultural goods and scarcity of manufactured goods explain to a large extent the downward movement of terms of trade for the agricultural sector in this period. The trade policy adopted in Pakistan to deal with the foreign-exchange crisis was an additional important factor in the movement of terms of trade against agriculture.

The second period from 1954–57 to 1965–68 was one of rising relative prices for the agricultural sector as the terms of trade showed an improvement of about 29 percent over this period. The spurt in the agricultural output and a relative slow-down of the industrial output were responsible for an improvement in the terms of trade. The introduction of subsidies on some selected farm inputs and the fixation of support prices for a few major crops in the early 1960s were responsible for effecting an improvement in the barter terms of trade.

Increases in wheat and rice outputs as a result of the Green Revolution, and the mounting bill for the treasury on account of subsidy for farm inputs, had convinced the government of the need to moderate the price increases for the crops and to reduce the level of subsidies on farm inputs. The slight downward trend in the net barter terms of trade noticed for the 1965–68 – 1968–71 period is a consequence of the government's efforts to force agriculture to share its productivity gains with the rest of the society.

The devaluation of the rupee in 1972 and increases in the rate of subsidies on farm inputs in the early 1970s had given an upward trend to the indices of the terms of trade. The improvement in the terms of trade, of about 10 percent between 1968–71 and 1975–78, was mostly due to the changes in the rate of foreign exchange and to an adjustment of sectoral prices of agricultural inputs and output in response to the changes in world prices. A deliberate policy of the removal of subsidies on farm inputs accompanied by an increase in the support prices for major crops has been in force since the late 1970s. The downward trend in the terms of trade since 1979 is partly a result of this deliberate policy choice. The examples given above from economic history illustrate the crucial role played by both macro economic policies and sectoral policy initiatives in the determination of trends in the terms of trade.

Estimates of terms of trade at a more disaggregated level point to considerable differences in the pattern of price changes between consumption goods, intermediate goods and investment goods.<sup>5</sup> The prices of investment goods have risen

<sup>5</sup>It may be useful to note that the terms of trade for an entire sector, for selected groups of commodities, and intra-sectoral transactions address different analytical and policy issues. Each concept of the terms of trade assigns weights to the items traded. As such, the aggregation problem highlighted by the official discussant is not encountered in the analysis.

and, for most years, the terms of trade are adverse relative to 1959–60. The trends in terms of trade for intermediate goods and consumption goods are parallel to the overall sectoral terms of trade. The improvement in the terms of trade is higher for intermediate goods than for consumption goods. The prices of food crops relative to those of cash crops show considerable variation through time. Relative food prices were low till 1965–68, rose thereafter and then again fell to a low level in 1976–79. A sharp rise in the relative profitability of the production of one type of crop relative to another may have been responsible for this variation.

The trends in single factorial terms of trade are more or less parallel to the trends noted for the net barter terms of trade. The only difference is that the rise in single factorial terms was much sharper in the period from 1963–66 to 1972–75.

The net barter terms of trade of the agricultural sector and of the food crop producers indicate incentives for agriculture and the food sub-sector respectively. The barter terms of trade indicate that one group's benefits are the other group's losses and the extent of the loss/benefit is measured by the deviation from the unit level. The income terms of trade measure the purchasing power of a sector. In the case of the income terms of trade, the deviation from the unit level of a sector does not necessarily imply a worsening of the purchasing power of the rival sector.

The income terms of trade are defined as the ratio of the value of sales by a sector to its average import price. Since no data series exists for the marketed surplus, we have measured the income terms of trade as a product of the net barter terms of trade and an index of agricultural output. The income terms of trade remained depressed till 1957–60 but showed an increasing trend afterwards. In fact, these terms registered a decline for the period from 1951–52 to 1955–56. The explanation of the trends observed in the income terms of trade lies in the movements of its two components, the net barter terms of trade and the physical agricultural output. An increase in output with no change in relative prices increases the income terms of trade, while a movement of the internal terms of trade adverse to agriculture, *ceteris paribus*, reduces the income terms of trade. The agricultural sector was squeezed by the declining internal terms of trade during the 1950s. For later years, the purchasing power of agriculture shows an increasing trend. This is mainly due to the productivity gains of agriculture. In fact, increases in the physical agricultural output more than offset the impact of declining barter terms of trade on the income terms of trade for the years identified above when barter terms showed some decline.

#### SELECTED ASPECTS OF THE IMPACT ON RURAL ECONOMY

Active price intervention showing variation in form and intensity generates many critical policy issues. Some of these issues are: the impact and role of price

incentives on farm production, the efficiency of resource use, and the distribution of income.

### Price Incentives and Aggregate Farm Output

High prices, in theory, not only have implications for an efficient use of resources but can also shift the production function upwards by price-induced technological and institutional innovations and infrastructural investment in rural areas. In order to examine the impact of the terms of trade on farm output, a linear relation between the index of agricultural output, net barter terms of trade lagged by a year and the supply shifter variables was estimated. The equation estimated for the 1951-52 – 1983-84 period is as follows :

$$Q_t = -13.72 + .75Q_{t-1} + .28P_{t-1} + 0.07Z_t + 1.12T$$

$$\begin{matrix} (-0.63) & (6.05)** & (1.55)* & (2.80)* & (1.40)** \\ \bar{R}^2 = .92 \end{matrix}$$

where  $Q$ ,  $P$ ,  $Z$  and  $T$  are, respectively, an index of agricultural output, terms of trade, percentage of the net sown area irrigated, and time trend. Figures in the parenthesis are  $t$ -values of regression coefficients and (\*\*) and (\*) indicate coefficients significant at the one-percent and 10-percent levels respectively.

The terms of trade have a positive effect on output. By the conventional criterion of significance, the price coefficient is marginally significant. The estimated short-run price elasticity of .18 and the long-run price elasticity of .72, calculated at mean values, are within the range found for other developing countries.<sup>6</sup>

The first shifter variable, the proportion of the net sown area irrigated, captures the impact of price-induced technical change on farm output. The spurt in the installation of private tubewells, which began around 1959-60, has been attributed by some analysts to the profitability of additional water [12]. The profitability of water was, in turn, linked to the pricing policy regarding both output and inputs of the agricultural sector. Some analysts have demonstrated a link between farm prices and public investment in agriculture [1]. Higher prices for agricultural produce increase the financial rate of return on agricultural projects and justify increased allocations for the agricultural sector. The significant positive coefficient of the irrigation variable shows the importance of price-induced innovations.

The coefficient of the time-trend variable measures the impact of autonomous technical change on farm output. Without minimizing the role of price-induced

<sup>6</sup>For a theoretical justification of the estimation of short- and long-run price elasticities from the above relationship and the assumptions underlying the estimation of supply response using a Nerlovian distributed lag model, see Gotsch and Brown [3].

innovations, it can be argued that basic scientific knowledge is weakly related to prices and has its own growth momentum. Its beneficial impact on farm output is evident from the significance of the coefficient of the time-trend variable in the estimated equation.

### Trade Policy and Resource Use

The implication with respect to allocation efficiency from the society's point of view can be spelled out after we know the extent of correspondence of private signals transmitted to farmers with the short- and long-run social benefits and costs, as measured by world border prices.

Gotsch and Brown [3] have documented the pervasive impact of trade interventions in the distortions of incentives for agricultural producers in Pakistan. The nominal and effective protection coefficients for major crops show that domestic prices of most crops are lower than the world prices. For most of the industrial goods, the domestic prices are higher than the world prices. In this sense, Pakistani policy-makers have undervalued agricultural production. The disaggregated analysis by crops and by different time periods shows that incentives vary with crops and, for different crops, over time. The food crops were subsidized while export crops were taxed. Sugar-cane, wheat and maize were provided considerable protection up to about the early 1970s. Considerations of self-sufficiency in food seem to have determined this policy option. There has also been a distinct break in the pattern of incentives since about 1972-73. The devaluation of the rupee in May 1972 increased the border prices. Abrupt and wide fluctuations in world commodity prices during the 1970s and the 1980s have imparted instability to the values of protection coefficients. Despite the instability observed, a distinct movement of the protection coefficients of most crops towards the value of one has been evident during the last few years.

The evidence on the presence or absence of distortions arising from trade policy is only the starting point in the evaluation of efficiency implications. The measurement of the cost of distortions in terms of economic welfare is the next logical step. Research on this is totally lacking in Pakistan. For this, the estimation of demand and supply curves as a basic input in the measurement of consumer and producer surpluses is the first requirement. The question of whether and how much agricultural incomes and employment would have increased if world prices had been adequately reflected in domestic incentives deserves a high priority for research.

### Impact on Distribution of Income

The relationship between agricultural pricing policies and distribution is complex and has neither been modelled adequately nor subjected to a detailed

empirical enquiry. Some attention has been given to the relative sectoral distribution issue and distribution of personal incomes while no or very little attention has been paid to the impact of pricing policies on the regional distribution of income.

Agricultural prices determine the income of the farmers and affect the living standards of the people engaged in farming and other professions, as agricultural commodities form an important part of wage goods. A controversy rages among economists whether the transfer of income takes place between sectors or between high-income agricultural producers and low-income urban and rural consumers. Tyagi [16] has argued that in India high farm prices have transferred income from urban areas to rural areas and that all groups in rural areas have benefited from those prices. Ashok Mitra [11] believes that a transfer has taken place from low-income urban and rural consumers to high-income agricultural producers. The limited evidence that we present for Pakistan provides some support to the contention that the pricing policy has primarily resulted in an intersectoral transfer of income.

The notion that high farm prices benefit large farmers and hurt the landless labour and small farmers is based on two assumptions: (1) labourers depend on the market for purchases of wage goods, and (2) incomes of the wage labourers and small farmers are independent of produce prices. The evidence we present below indicates that these assumptions do not hold in their pure form.

Table 2 shows the sources from which rural households obtain wheat flour. The reliance on the market for supplies of wheat and wheat flour shows considerable variation between provinces and, within each province, between farm and non-farm households. Own farming and wages in kind are the dominant sources of wheat flour for farm households and for all households. Even in the case of non-farm households, these two sources are important. High farm prices imply an automatic increase in income for the component accounted for by wages in kind and own farming. The assumption that income and farm prices are independent is clearly violated. The fact that of the total amount of flour obtained through market by all rural households 25 percent is obtained in the Punjab, 24 percent in Sind and 48 percent in the NWFP shows that the dependence on the market is not high.

The data on trends in rural real wages further cast doubt on the hypothesis that landless labourers may lose as a result of high farm prices. Guisinger and Hicks [4] and Irfan and Ahmed [5] have provided a series of rural wages for selected years between 1952 and 1973 and for each year between 1973 and 1984. There was a pronounced upward trend in real wages between 1952 and 1973. As a matter of fact, the real wages for casual workers in 1973 were higher by about 60 percent over those in 1952, the benchmark year. The series constructed by Irfan and Ahmad showed declines in the real wages between 1974 and 1976, an upward level for the

Table 2

*Percentages of Wheat Flour Obtained by Rural Households  
by Type of Household, Source and Province*

Province	Type of Household	Percentage of Wheat Flour Obtained from				
		Own Farming	Wages in Kind	Open Market Wheat	Ration Flour	Open Market Flour
Punjab	All Households	55	12	18	8	7
	Farm Households	82	2	6	6	4
	Non-Farm Households	20	26	34	10	10
Sind	All Households	73	2	6	1	18
	Farm Households	89	—	4	1	7
	Non-Farm Households	7	9	16	—	68
NWFP	All Households	42	11	1	—	47
	Farm Households	50	9	—	—	41
	Non-Farm Households	31	13	1	—	54

*Source:* The Survey of Wheat Markets jointly conducted in 1982 by the Pakistan Institute of Development Economics, Islamabad, and the Centre for Development Planning, Erasmus University, Rotterdam.

years from 1976 to 1981, and a slight downward trend since 1981. The close correspondence between real wages and net barter terms of trade for agriculture again shows the salutary effect of high prices on the rural income of the landless labour in the agricultural sector. The conclusion that we reach then is that the interests of large farmers, small farmers and the landless wage labour in rural areas are more or less identical as far as farm prices are concerned. It must, however, be noted that the similarity in the interests of these groups obtains in the long run after the price incentives have had their impact on the income of the poor through increased job opportunities. In the short run, high food prices impose a burden on poor consumers. A role for targeted food subsidies for the benefit of the poor is obvious.

The incidence of high farm prices on urban income distribution has also aroused a controversy. Some believe that high food prices hurt mainly the low-income urban consumers. Brown [1] has shown that in the case of Pakistan urban wage levels have responded fairly quickly to the cost of wage goods. If Brown is correct, high food prices may have more impact on urban profits than on real incomes of the

wage earners. In any case, the analysis of high food prices needs to take account of the national food subsidy schemes that have a dual pricing system and funnel the bulk of rationed food to urban areas. Naqvi and Cornelisse [13] in their study of wheat marketing have shown that the rationing system as it has operated has discriminated against the rural areas, especially the rural NWFP, Sind and Baluchistan. They have further shown that wheat-market actors (millers, ration shop-keepers and the Food Department officials — all belonging to high- or middle-income classes) appropriate for themselves a part of the benefits intended for the rural and urban poor. The difference between the domestic producer prices and consumer prices and the public expenditure on the administration of the rationing system require huge budgetary subsidies. The financing of these subsidies is generally regressive. The intervention by the government in the public distribution of wheat may have been beneficial to the middle- and upper-income consumers in the urban areas.

The impact of input pricing on income distribution and agricultural development has not been discussed so far. The case built for the introduction of subsidies on modern inputs (fertilizer, pesticides, water) in the early 1960s was to familiarize farmers with the new innovations and to encourage them to use these inputs on a large scale. There is a growing literature in Pakistan which shows that input subsidies may have outlived their original justification. Gotsch and Brown [3] and Cheong *et al.* [2] have pointed out that subsidies on water may encourage a wasteful use of the scarce water supply. Subsidies on machines tend to displace labour and provide wrong signals to farmers for the use of capital-intensive technology. Since access to inputs is largely determined by the size of holding, it is not surprising that farm subsidies benefit mostly the large and progressive farmers in Pakistan. Since large farmers are not necessarily efficient users of modern inputs, a policy that diverts inputs to small farmers would maintain or increase the output. Research on the identification of institutional interventions that ensures larger supplies of modern inputs to smaller farmers command high priority. However, what must be stressed here is the need for a reduction of farm subsidies with a view to encouraging farm production and improving income distribution in the farm sector. Subsidized input prices at this stage are providing an element of rent to large farmers. Small farmers are already paying high market-clearing prices for the subsidized inputs which are in short supply.

### CONCLUSIONS AND POLICY IMPLICATIONS

We can be very brief in conclusion. Basic data on prices, sales and marketings of the goods and services entering in the intersectoral trade need an improvement. Notwithstanding the weaknesses in the basic data, the preceding analysis sheds light on various policy-relevant issues and has several interesting implications. These are briefly summarized below.

1. The barter terms of trade of the agricultural sector have shown an upward trend over the entire period from 1951-52 to 1983-84. However, this trend conceals in it periods of considerable decline, considerable increase and large fluctuations in the net barter terms of trade. There was a declining trend in the 1950s, a sharp upward trend during most of the 1960s, large fluctuations in the 1970s and a declining trend since 1977-78.

2. The efficacy of price instruments as a source of agricultural development was noted. The aggregate farm output was positively related with the net barter terms of trade, irrigation ratio and the time trend. Notwithstanding the importance of a positive price policy for agriculture, a case can be made for an active technology policy and an expanded programme of public investment benefiting the agricultural sector. The long-run viability and productivity of the Indus Basin implies vast public investments in agriculture. It should be noted that it is easier to extract surplus out of increased production than out of stagnant output. Increasing farm output requires a provision of gross resources in the form of irrigation, research, credit and other modern inputs. Starving agriculture of resources too soon may mean a large amount of forgone farm output.

3. A public investment programme of the type needed requires increased resource mobilization from the agriculture sector. The extent of improvement in the purchasing power of agriculture since 1953-56 is large. Farmers' ability to pay taxes and their capacity to pay for modern inputs have improved considerably. This fact should be clearly noted in the debates on reducing farm subsidies or increasing tax burden on agriculture. The agricultural sector in Pakistan has been taxed mainly by trade policy. Direct taxes have been too low to be a major force. The farm subsidies on inputs have shown considerable increases mainly due to the explosive increase in the quantity of the inputs used. Very little support can be marshalled for input subsidies from the vantage point of efficiency and agricultural development. Taxation of the agricultural sector through trade policy is inefficient. There is a strong case for increased taxation of the agricultural sector through direct taxes on land and/or agricultural income and reduced levels or withdrawal of input subsidies.

4. The impact of agricultural price policies on both the output and input sides of income distribution has an interesting and useful policy implication. That high farm prices benefit large producers is obvious. We have also found some support for the view that high farm prices benefit small farmers and the landless labour. Farmers' capacity to hire labour is a function of the farm prices. Benefits from subsidized inputs tend to accrue, in a large measure, to large producers. Reducing input subsidies would not hurt the small farmer but could release public resources for financing investments for the benefits of small farmers. In this sense, remunerative farm prices and low or no subsidies on farm inputs should increase the efficiency of resource use and the welfare position of the small farmer and the rural poor.

5. Incentives to producers could be given through attractive produce prices, subsidized prices for inputs, technological innovations and investment in complementary sectors. Detailed specific research on the relative benefits and costs of providing incentives through these policies is required. The theoretical and empirical aspects of determination of support prices for different crops that provide just the right amount of incentives and maintain appropriate price relatives for different crops should be given a high priority in the research agenda. Incentives, measured by the rural-urban terms of trade, are the outcome of a host of interacting sectoral and macro policies. It is important to ensure that the commodity-specific price policies and the macro-economic policies are a consistent policy set in their impact on farm incentives.

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**Comments on  
"Domestic Terms of Trade and Public Policy  
for Agriculture in Pakistan"**

I am grateful to the organizers of the seminar for inviting me to be an official discussant of the paper: "Domestic Terms of Trade and Public Policy for Agriculture in Pakistan." The subject of the paper is quite important and interesting while the findings of the paper are likely to generate considerable heat. Because of the short time available to me, I shall try to be rather brief.

The author in his review of the previous studies on the subject has highlighted the methodological problems/limitations of these studies and has classified the previous studies on the subject into two groups: (a) Studies on intersectoral terms of trade based on implicit price deflators estimated from the national accounts data [1], and (b) studies based on wholesale prices and a set of weights for different items traded between the agriculture and the non-agricultural sectors [2; 3; 4; 5].

The author has alleged that the terms of trade worked out from the national accounts data through the estimation of implicit deflators suffer from serious limitations as the weightage assumed by different commodities in this case is their production and not their marketable surplus. He rightly argues for the use of weights based on marketable surplus.

In practical situation, however, there may be some genuine difficulties in this regard, since data on marketable surplus are often not available. Nevertheless, these data constraints may not seriously jeopardise the results as marketable surplus is likely to move in sympathy with the production. Unless the production patterns have changed radically, whereby commodities, whose marketable surplus is radically different than the original ones are being grown, the results may not be much different. Moreover, in analysing the movements in the term of trade over a given period of time this may not affect the pattern of movements since the same approach would have been followed throughout. The criticism of using weights based on production rather than the marketable surplus, levelled against the 1st group of studies also applies to the second group of studies as they have also used weights based on production rather than marketable surplus. This also applies in the study under review.

The study under review has followed the methodology used by Lewis and Hussain [3] in working out the movements in relative prices for the agricultural

sector. It has also used the same weight scheme as used by Lewis and Hussain in their study.

Using 3-year moving averages, the author has worked out (a) net barter terms of trade (b) income terms of trade and (c) single factorial terms of trade, for the period from 1951 to 1984.

The use of the same weights as used by Lewis and Hussain in their study during the 1960s may not be appropriate since the economy has experienced substantial changes during the intervening years. Empirical estimation by the author also suffers from the arbitrary assumption of weights as it has been estimated by assuming per capita expenditure in rural areas on different commodities is 25 percent less than the per capita expenditure on the same goods in the urban areas. It may be pointed out that Dr Kazi [3] has also faulted Lewis and Hussain for the use of arbitrary weights in their study. In view of Dr Kazi's criticism of the weight scheme of Lewis and Hussain, the author owes to his readers an explanation for using the same approach.

The empirical results of the study under review indicate that the prices of investment goods have experienced faster growth for most of the years as compared to the prices received by the agricultural sector. Therefore, net barter terms of trade for the agricultural sector vis-a-vis investment goods have deteriorated since 1959-60. This finding would have serious repercussions for capital formation in the agricultural sector. The author also notes a downward trend in the terms of trade since 1979 which is attributed to a deliberate policy choice by the Government, as the Government policy has been designed to reduce input subsidies and increase procurement prices for the major crops. The deterioration in the terms of trade, the author argues, has resulted because the increase in input prices was not accompanied by a sufficient increase in output prices to offset the increase in input prices. However, the deterioration in the net barter terms of trade for agriculture may also be partly due to the fact that the falling trend in the prices of agricultural commodities such as wheat, rice, sugar, and cotton in the international markets as determining the domestic support/procurement prices is, *inter alia*, constrained by the international prices.

The analysis is highly aggregate in which different sub-sectors of agriculture sector, viz. food crops, cash crops, livestock, forestry, and fisheries, have been lumped together.

Since these sub-sectors are subject to diverse pressures the aggregation by cancelling them must have dampened the movements in the price indices. The aggregate analyses would have a limited use for policy planning.

The results of the analysis may be sensitive to the use of various prices. For quite some time the government has been intervening in the agricultural product markets through the announcement of support/procurement prices. If the analysis were disaggregated enough, i.e. if the agriculture sector was subdivided into its

component sub-sectors (crops, foodgrains and cash crops, livestock, forestry, etc.), the results could have been confirmed through the use of procurement/support prices as the reporting of wholesale prices of primary commodities suffers from serious conceptual and practical limitations.

In order to examine the impact of the terms of trade of agriculture on farm output a linear equation has been estimated. The variables included in the equation are lagged index of agricultural output, lagged terms of trade of agriculture, percentage of the net sown area irrigated and time trend while the index of agricultural output is used as the dependent variable.

From the positive but marginally significant coefficient for the terms of trade variable the author pleads for designing a favourable price package for the agricultural sector if the government's objective is to increase agricultural output.

The equation estimated to explain the impact of terms of trade on aggregate output suffers from too much of aggregation to be helpful in policy planning. Since price policy to be effectively implemented has to be by and large commodity specific, a disaggregated analysis might have been helpful in this regard. Even more serious than the aggregated nature of the analysis is the kind of relationship being envisaged and attempted through estimation of the complex relationships underlying the phenomenon by a single equation. The use of prices or terms of trade as one of the independent variables along with other such variables as are also thought to be influenced by the prices included in the function is highly questionable.

From the analysis, the author concludes that improvements in term of trade are extremely important for agricultural development and call this as a pre-requisite for sustained agricultural development. The importance of favourable terms of trade for agricultural development is well recognized in the literature on the subject. But there are definite limits on the achievement of the pricing policy also. The pricing policy cannot and should not be taken as a panacea for all the ills afflicting the agricultural sector. Judiciously formulated and effectively implemented agricultural pricing policy, if accompanied by other technological developments and research efforts should be helpful in expanding the production frontiers in agriculture. However, in the absence of such efforts mere pricing policy is not likely to deliver the goods. The case of oilseeds in Pakistan can be cited to support this contention. What is needed herein is a genuine research and institutional infrastructure to provide innovations and pricing policy should play the supporting role. The institutional system of research and technological developments must be geared to providing a continuous stream of technological breakthroughs.

The author's argument that higher prices can lead to efficient use of resources and shift the production function upward is confusing. Higher output prices are likely to encourage movements along a given production function by increasing the

marginal returns to the input use, while there is little likelihood of a shift in the production function in the short run. However, higher output prices may encourage investments in research which could result in high payoff innovations leading to outward shifts in the production function in the long run.

The study has also proposed an imposition of income tax on agricultural incomes. However, the proposal is not backed by the likely estimates of costs and returns which would accrue from the scheme. This proposal has been mooted time and again even in the press but not much serious attention has been given to the likely implications for implementing the scheme.

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