

Economic Analysis of the Effects of Wheat Price Distortions in Pakistan: 1975-90

NUZHAT IQBAL

Price distortions induce the inefficient utilisation of resources by giving incorrect signals to producers and consumers. Since distorted prices do not reflect the real value of resources, quantities of goods and services produced may not be consistent with their demand. These may be caused by a number of different reasons. They may, for instance, be caused by monopolistic tendencies, preferential treatment of a particular sector of the economy, establishment or diffusion of a particular product or an input, etc. In fact, price distortions occur sometimes from deliberate and sometime inadvertent government policies of subsidies and price supports in pursuance of certain social or economic objectives. In fact, where there is no government intervention, prices equilibrate consumer demand with the productive capacities of producers. If prices are distorted by any agency their allocative role is seriously diminished. Resource use efficiencies increase if the government restricts its role to ensuring proper functioning of the market and lets prices be determined by the forces of demand and supply. Nevertheless, it is now being increasingly recognised that agricultural price distortions are inherently adverse to the national economy because they stimulate a non-optional transfer of resources out of agriculture when set too low, and putting an excessive burden on consumers when set above world prices. This study shall discuss the price intervention mechanism adopted in Pakistan, then, analyse the effects of distortions of prices and the role of distorted prices in achieving the above mentioned objectives.

ANALYTICAL EXPOSITION

The Marshallian economic surplus framework based on partial equilibrium analysis constitutes the theoretical basis for the analysis of the effect of price distortions in Pakistan. The effects are derived in both their real and pecuniary form

Nuzhat Iqbal is Research Fellow at the International Islamic University, Islamabad.

Author's Note: I am deeply indebted to Prof. Syed Nawab Haider Naqvi and Prof. Rafiq Ahmed, for their constant encouragement and valuable guidance. I highly appreciate the useful discussions with Dr M. Ghaffar Chaudhry on the subject. However I alone am responsible for any remaining errors.

by computing nominal protection coefficients (NPC) on the basis of domestic and border or international prices. The nominal protection coefficients thus derived determine the effects of distorted prices on the welfare of consumers and producers, resource use efficiency, growth, income distribution, stability and employment. Domestic prices used, are defined as the prices at farm and consumer level. The world prices, on the other hand, are defined as the prices in the international markets for relevant commodities at the same time or period. In fact, the international prices reflect the opportunity cost of the products under consideration and thus the nominal protection coefficients measure the disparity between the prices in the domestic markets with the prices in the next best alternative use.

The causes of price distortions evaluated are input subsidies, output controlled prices, concessional credit disbursement, tariffs, import and export taxes, overvalued exchange rates, etc. More specifically, the subsidies associated with inputs like fertilizer, irrigation water, pesticides, credit, etc. will be considered. The effects of support and procurement price programmes are examined with reference to wheat. The data for the period from 1975 to 1990 is used for the analysis. Since Nominal Protection Coefficients provide a measure of the disparity between domestic prices and international prices, the derivation of the nominal protection coefficients therefore proceed as:

$$NPC = 1 + \frac{P_d - r P_w}{r P_w} = \frac{P_d}{r P_w}$$

Where:

- P_d - domestic price;
- P_w - world price (Border price); and
- r - equilibrium exchange rate.

The basic structure of the analytical model comprises of the following components.

1. Net Social Loss in Production

$$\begin{aligned} NSL_p &= \frac{1}{2} (Q_w - Q) (P_w - P_p) \\ &= \frac{1}{2} t^2 p_n V \end{aligned}$$

Where:

- Q_w = Production at World Prices;
- P_w = World Prices;

- Q_p = Production at domestic prices $P \times d$;
- t_p = Proportion of tariff in domestic price at the producer level;
- P_p = Producers Prices;
- n_s = Elasticity of domestic supply/ TBC; and
- V = Value of production at prices faced by producers.

2. Net Social Loss in Consumption.

$$NSL_p = \frac{1}{2} (Q_w - Q) (P_w - P_p)$$

$$= \frac{1}{2} t_p^2 n_s V$$

Where:

- C_w = Consumption at world prices;
- C_p = Consumption at domestic prices;
- t_c = Proportionate of tariff in domestic prices at the consumer level;
- W = Value of consumption at P_c ;
- P_c = Consumer Prices; and
- n_d = Elasticity of domestic demand.

3. Welfare Gain of Producers.

$$G_p = Q_p (P_p - P_w) - NSL_p$$

4. Welfare Gain of Consumers.

$$G_c = C (P_w - P_c) - NSL_c$$

5. Change in Foreign Exchange Earnings.

$$dF = -P_w (Q_w - Q \pm C - C_w)$$

6. Change in Government Revenue.

$$dG = (NSL_p \pm NSL_c) - G_p - G_c$$

-(1) - (2) - (3) - (4)

7. Change in Rural Employment.

$$dL = dQ L/Q$$

Graphic explanation of producers and consumers export and import prices are reflected on the sheets attached.

The analysis is argued by working out effective protection rates for wheat. The following procedure is used in determining the effective rates of protection.

$$ERP = \frac{VAD - VAW}{VAW}$$

Where:

VAD = Value added at domestic prices.
 VAW = Value added at world prices.

The value added at world prices (VAW) has also been used to measure domestic resource costs incurred as a result of policies distorting agricultural prices. Domestic resource costs are being estimated with reference to the following equation:

$$DRC = \frac{DR}{VAW}$$

Where:

DR = Value of domestic resources employed in particular activity.
 VAW = Value added at world prices.

CRITICAL EVALUATION

Our analysis reveals that the wheat prices have often been fixed through the price intervention mechanism. As a result the levels of production are significantly lower than what it would have been in the absence of distortions. On the other hand, the situation is reversed with respect to consumption. Thus the pricing policies have a beneficial effect on providing more for consumption, which is according to the policy objective. This situation is, however at the expense of this sector.

EFFECTS ON WELFARE

The analysis clearly manifests that the economy of Pakistan incurs large annual welfare losses. Generally the losses are due to the misallocation of resources which result from the agriculture pricing policies (Table 1). Both short – and long-run supply elasticities have separately been used to calculate the social loss in produc-

tion. The results indicate that in comparison with economic output, distortions are generally more costly. Since the results are calculated from a partial equilibrium model therefore these present partial effects. As the results determine the most sizeable effects of the agricultural policies are the welfare transfers between consumers and producers, we see, therefore, that the consumers generally gained from this type of price intervention.

Table 1
Calculated NPC, NSLP, NSLC

Years	NPC	NSLP Short Run Supply Elast	NSLP Long Run Supply Elast	NSLC
1975-76	0.56	202989.80	541306.00	- 301284.70
1976-77	0.56	96847.41	258259.80	- 124070.80
1977-78	0.63	66450.74	177202.00	- 73308.55
1978-79	0.64	103679.50	276478.80	- 170183.20
1979-80	0.70	181072.50	482860.10	- 99050.07
1980-81	0.59	282355.00	752946.60	- 349197.00
1981-82	0.54	421020.50	1122721.00	- 452637.60
1982-83	0.60	266536.30	710763.50	- 256861.60
1983-84	0.46	1067740.00	2847306.00	- 473591.50
1984-85	0.52	662079.40	1765545.00	- 759425.90
1985-86	0.65	160389.70	427705.90	- 177484.80
1986-87	0.53	686740.20	831307.00	- 936050.80
1987-88	0.54	726740.30	2031307.00	-1123797.70
1988-89	0.54	817930.50	2531389.00	- 956587.80
1989-90	0.48	838940.60	3031479.00	- 996589.40

Source: Calculated on the basis of official data.
 NPC = Nominal Protection Coefficients.
 NSLP = Net Social Losses in Production.
 NSLC = Net Social Loss in Consumption.

EFFECTS ON GOVERNMENT REVENUE

Our results differentiate the revenue as the government is receiving increased revenues from their interventionist policies. These results are based on the implicit assumption that the entire price distortion is attributable to taxes (or subsidies). As we have been importing wheat with NPCs of less than 1, the entire distortion is due to government subsidies (Table 2).

Table 2
Short-Run, Long-Run, Direct and Total Effects of Distortions on Exports and
Consumption, Foreign Exchange and Relative Value Added.

Year	EXPORT			CONSUMPTION			FOREIGN EXCHANGE			RELATIVE VALUE ADDED			
	S.R.	L.R.	Total	S.R.	L.R.	Total	S.R.	L.R.	Total	VA/PNA	VA/PNA	Effective	
	Direct	Direct	Total	Direct	Direct	Total	Direct	Direct	Total	VA/PNA	VA/PNA	Protection	
1975-76	-2.34	-1.91	-1.81	0.09	-1.48	0.12	-0.28	-0.47	-0.35	-0.69	14468378.23	37523429.10	-0.61
1976-77	-1.31	-1.24	-1.22	0.07	-1.15	0.10	-0.24	-0.42	-0.32	-0.62	13730959.63	25759297.37	-0.47
1977-78	-2.76	-1.99	-1.97	0.07	-1.50	0.10	-0.16	-0.29	-0.21	-0.43	11055091.80	24268558.81	-0.54
1978-79	-2.79	104.25	-1.34	0.06	-2.82	0.09	-0.15	-0.28	-0.21	-0.43	15972701.24	32964150.99	-0.52
1979-80	-1.61	-1.36	-1.37	0.02	-1.20	0.06	-0.12	-0.22	-0.16	-0.35	16035090.65	28648195.72	-0.44
1980-81	-1.16	-1.12	-1.12	0.05	-1.08	0.09	-0.16	-0.28	-0.20	-0.40	18320500.30	35785211.11	-0.49
1981-82	-1.19	-1.15	-1.15	0.06	-1.10	0.09	-0.19	-0.33	-0.24	-0.47	16157143.96	34698134.59	-0.53
1982-83	-1.16	-1.13	-1.13	0.05	-1.09	0.08	-0.18	-0.27	-0.22	-0.38	18627722.16	32770066.65	-0.43
1983-84	-1.12	-1.10	-1.10	0.11	-1.07	0.13	-0.22	-0.32	-0.26	-0.45	13528062.20	39496861.58	-0.66
1984-85	-2.26	-1.85	-1.58	0.08	-1.36	0.10	-0.13	-0.20	-0.20	-0.34	15006304.83	34163590.43	-0.56
1985-86	-3.79	-2.50	-2.09	0.04	-1.63	0.07	-0.13	-0.20	-0.18	-0.31	20204358.14	30792919.15	-0.34
1986-87	-1.12	-1.11	-1.10	0.09	-1.08	0.10	-0.18	-0.23	-0.21	-0.31	15268106.74	32490817.60	-0.53
1987-88	-1.80	-2.25	-1.50	0.10	-1.25	0.13	-0.20	-0.25	-0.23	-0.39	15927317.65	33591926.60	-0.58
1988-89	-2.25	-2.85	-1.70	0.13	-1.45	0.15	-0.25	-0.29	-0.27	-0.43	17634234.45	35167813.45	-0.69
1989-90	-3.00	-3.20	-2.00	0.15	-1.67	0.19	-0.27	-0.32	-0.31	-0.49	19215623.30	38216325.25	-0.72

Sources: Calculation based on the given data implying into the model Foreign Exchange Effect = $(F-FNI)/TF$. F = Foreign Exchange with intervention. FNI = Foreign Exchange without intervention. TF = Total Foreign Exchange Earnings. $(VA/PNA-VA/PNA)/VA/PNA$
= The effect of price intervention on Relative value added.

Note: Export effects and interventi = $(E-ENI)/ENI$ E = Export with intervention. ENI = Export without intervention.

EFFECTS OF PRICE INTERVENTION ON TRADE

The effects on trade consist on the effects of both, production and consumption. Whereas, generally, we find that the pricing policies have a negative effect on exports which results in the reduction in the exports (with NPCs smaller than 1) (Table 1). However, in the case of imports with NPCs of less than 1 the imports increased by the sum of the absolute value of the effects on production and consumption.

EFFECTS ON RURAL EMPLOYMENT

Since the process of economic development is associated with internal migration, therefore, the economic theories on the subject attribute this transfer as a response to differences in employment opportunities. Potential migrants evaluate their costs and benefits associated with relocation and decide accordingly. Since a primary determinant in their decision is the relative income opportunities [Falaris (1979)]. It is, therefore, identified that price distortions have the effect of reducing farm employment which would not exist under free market prices. In general the absolute value of the effects are larger because of the labour intensive production methods.

EFFECTS ON FOREIGN EXCHANGE EARNINGS

Generally, the effects on foreign exchange earnings depends on the level of development. Since it is the case, here, therefore we lost foreign exchange earnings (Table 2) up to a deliberate level.

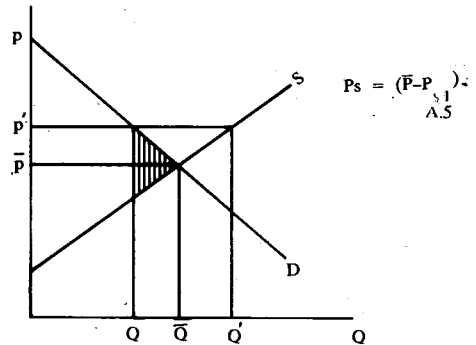
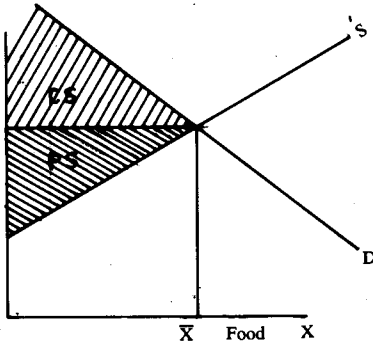
EFFECTS ON VALUE ADDED

Since the analysis has also been based on effective protection rates, therefore, the study analyses government intervention in input prices also. For instance; fertilizer subsidy in 1984-85 was equal to nearly 60 percent of the annual development expenditure in agriculture.

We observe that non-intervention relative value added is considerably larger than value added with intervention. While taking into account the fertilizer subsidy it tends to reduce the tax, but having value added instead of price in the denominator, increases the rate [Naveed *et al.* (1990).]

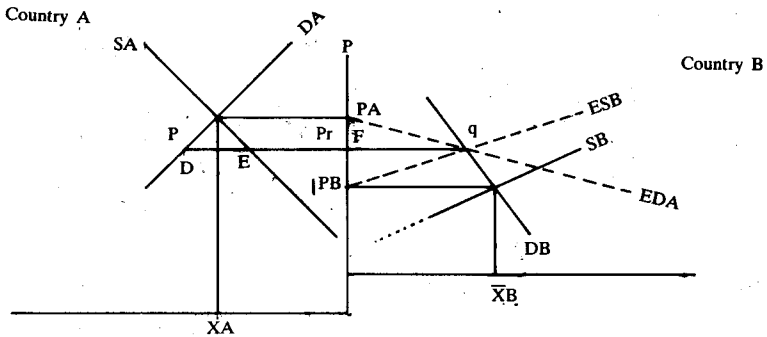
The graphic presentation of the concept is given below.

Trade between countries according to theory, resource prices and product prices *TEND* to equalise across borders (Net of Transport Costs) in the absence of tariffs and natural or legal barriers. The main question beyond the factor price equalisation and the Rybczynsky theorems is the price equalisation process.



CS is consumer surplus PS is producer surplus welfare (NET) = CS + PS

Assume 2 countries have different markets for good X before trade:



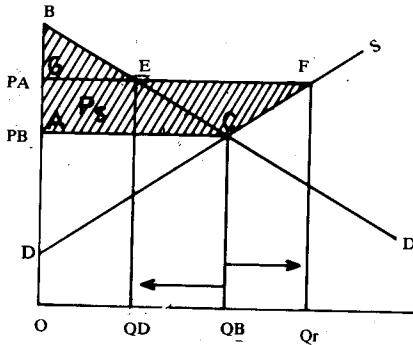
Country A originally has price PA, higher than PB in country A. By trading, an excess demand curve EDA extra demand as PB falls. As supply declines (ESB) A's is part of its supply goes to country B.

With trade, PA falls to PT, PB rises to PT. Quantity FG is traded to country A (Equals DE). The net welfare gains to both countries are PB G PA, with consumer surplus being PA GF, and producer surplus being FG PB. Alternatively the gains from trade to any country can be measured in two cases:

- A: Exports to higher price countries.
- B: Imports from lower price countries.

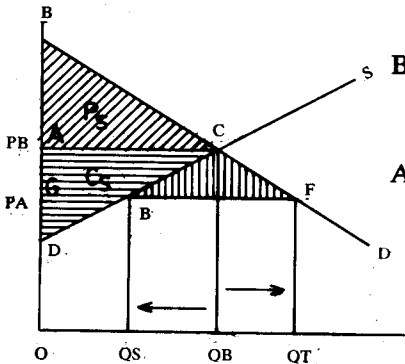
Case A

Export to Higher Priced Country



Case B

Imports from Lower Priced Country.



Before Trade:

PS = ACD

CS = BCA

Welfare = BCD

After Trade:

PS = GFD

CS = BEG

Welfare = GFD ± BGE

Domestic Consumption is QOD.

Trade is Q_D Q_r

Net Gain: EFC

Domestic consumption is OQD Trade is $Q_d Q_e$ Net Gain: EFC BCD

Before Trade:	PS	=	ABC
	CS	=	ACD
	Welfare	=	BCD
After Trade:	PS	=	GED
	CS	=	GFB
	Welfare	=	GED + BFG

Domestic consumption is OQT Welfare = GED + BFG
Trade is $Q_e Q_f$ Net Gain: ECF

The point of this exercise is this: If countries allow completely free trade, the border price will adjust to PT (Net of Transport Costs) and all resources producing that good will be fully employed and properly priced in both countries. If trade is restricted (Even where tariffs are not levied) countries should aim for PT to allocate resources. As if trade were occurring to maximise welfare in both countries.

CONCLUSION

The study establishes the vital role of wheat prices, the role which is to play in achieving optimum output and growth in productivity. The magnitude of income transfers for the social losses are significant. The effects of price distortions on rural employment are nonetheless serious, which confirms high unemployment rates. Since unemployment rates and rates of rural to urban migration are greater than the rates of urban job creation, therefore, this creates serious disguised unemployment which is prevalent in rural areas (Todaro). Thus, the policies such as agricultural pricing policies, need to be examined carefully because this study substantiates that higher agricultural prices would assist the rural population in a much better mode. On the other hand, with higher incomes, then demand for other kinds of production (goods and services) will increase, which in turn stimulates urban sector employment.

Comments on
“Economic Analysis of the Effects of Wheat Price Distortions
in Pakistan: 1975-90”

The paper discusses the price intervention mechanism adopted in Pakistan, particularly in respect of wheat. It analyses the effect of the resultant price distortions in achieving the under mentioned policy goods:

- (1) Efficiency in resource allocation;
- (2) Improving terms of trade between agriculture and industry;
- (3) Resource payment and income distribution;
- (4) Stimulating growth; and
- (5) Achieving price and income stability.

Using the Marshallian economic surplus framework it reaches the conclusion that as a result of price intervention by government the level of wheat production has been significantly lower compared to what it would have been in the absence of this intervention. The analysis however yields a reverse finding in respect of consumption in that the pricing policy has a beneficial effect on consumption that is to say that in the absence of government intervention the production level would have been higher and the consumption level would have been lower. Thus the paper asserts is at the cost of the agricultural sector in so far as it results in lower agricultural output and an uncompensated and non-optional transfer of resources from agriculture, which in turn depresses rural investment and employment opportunities resulting in migration from rural to urban areas.

The crucial assumptions underlying the above analysis and findings are:

- (a) A direct, positive and strong correlation between the price and output of various agricultural products, particularly wheat ignoring the serious constraints of quality seed, water, weather and the technological constraints in the field and average increases in agriculture;
- (b) In the absence of government procurement of wheat at ensured prices the farmers will be able to market their disposable surplus at the international price. It ignores the effects of the protective agricultural policy in the USA, Europe and Japan;
- (c) It takes for granted that a much higher international price compared to the domestic price will continue over a long period of time;

- (d) It was the landed price of the wheat imported by the government in Pakistan which was used as the proxy for the export price. It ignores the transportation, storage and the operation costs of the chain of the middlemen from farmers to the exporters; and
- (e) It ignores the nature and extent of displacements and disturbances in the existing pattern of land utilisation and cropped area, its effects on agricultural output and productivity.

The paper also suffers from a serious conceptual flaw in that it considers the producer's and consumer's welfare function as necessarily opposed to one another so far as price movements in agricultural products are concerned.

Apart from the non-existence of a "fully competitive market" which exists only on the pages of the textbooks of Economics, under conditions of underdevelopment where manual labour is the main source of energy supply, consumption, particularly food consumption in so far as it promotes the health and stamina of the working population has strong elements of productivity, output and investment. Cognitive power of school-going children largely depends on the nourishment they receive when they are in their mother's womb and during their early childhood. The percentage of students from poor family backgrounds would be sharply increasing during the next few decades. Hence the rate of investment on education particularly at the primary level would depend on the nourishment level of our school-going children, particularly those coming from poor family background. Human capital being the key factor in the process of economic growth and welfare, the rate of return on investment in nourishment of the population of an underdeveloped country, both tangible and intangible, cannot be measured in terms of the producer's surplus or the maximisation of the producer's welfare at the farm level and this is what the paper exactly does.

The differential between the price when the government imports wheat and the price at which it domestically procures wheat after accounting for the amount spent on subsidising the agricultural inputs does represent a net increase in the government revenue which no doubt amounts to taxing the surplus farmers. But in the absence of this increase in the revenue, the government would have been compelled to levy a direct tax on agricultural income.

Higher domestic wheat price at the consumer level and the sympathetic rise in the prices of other essential goods and services would have added to the existing inflationary pressure necessitating higher wages resulting in higher cost of production of the exportable manufactures further accentuating the balance of payments problems.

This macro, highly aggregated and all prevailing effects of reduced wheat consumption and higher wheat prices cannot be analysed within the Marshallian economic surplus framework based on partial equilibrium.

The paper however considers that resource use efficiency would increase if government restricts its role to ensure proper functioning of the market and let the prices be determined by the forces of demand and supply. What is meant by the proper functioning of the market? Does it mean anything other than equilibrating the demand and supply through the price mechanism without any external interference. To the extent the paper pleads for government intervention for restoring the proper functioning of the market the analysis suffers from conceptual ambiguities and inconsistencies.

The variables used in the equation are domestic price, world price or border price and the equilibrium exchange rate. These variables are too few, too simplistic, and inadequate to make the equation fully representative of the complex domestic and international economic situations governing the productivity, output and the trade of agricultural commodities, particularly wheat.

Israrul Haque

Islamabad.