COMPARATIVE ADVANTAGE OF COTTON PRODUCTION AND ITS POLICY IMPLICATIONS IN PAKISTAN

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This study assessed the comparative advantage of cotton production in Pakistan and determined that how far the current set of policies is consistent with the comparative advantage. The Domestic Resource Cost (DRC), Nominal Protection Coefficient (NPC) and Effective Protection Coefficient (EPC) were used for the analysis of data for the harvesting years, 1998-99 to 2002-2003. The analysis was carried out in the context of Policy Analysis Matrix (PAM). The Domestic Resource Cost (DRC) analysis for Punjab concluded that farmers in Punjab had comparative advantage in producing seed cotton for the study period. The value of Nominal Protection Coefficient showed that the seed cotton farmers in Punjab were taxed. This was further confirmed by the values of Effective Protection Coefficient. The analysis showed that Sindh had more comparative advantage than Punjab.

Keywords: Comparative advantage; DRC; NPC; EPC; Pakistan

INTRODUCTION

Cotton is considered as one of the most important cash crops playing vital role in the uplift of the country's economy. Cotton production is the principle source of raw material for textile sector – the largest agro-based industry which provides employment to about 40 per cent of the industrial labor. Cotton is ranked as the top foreign exchange earner which contributes to the exports of the country in the form of raw cotton, cotton yarn, cotton cloth and other by-products (Govt. of Pakistan, 2003).

Despite the significance of cotton in the economy of Pakistan, cotton production has been subject to instability due to fluctuating weather, changing government policies, rising cost of production (particularly because of high prices of insecticides and pesticides) and year to year variability in output prices. This has adversely affected the profitability of cotton growers as well as the welfare of textile sector.

It has been generally believed that Pakistan has an overwhelming competitive advantage in the production of cotton, even without additional technological change but it does not specialize as much as would have been profitable (Chaudhry and Sahibzada, 1994). However, trade liberalization under WTO regime, increasing competition and relative competitiveness of different countries poses a challenge to the competitiveness to the Pakistani cotton. One of the most important questions that arise is, should we specialize in cotton production or should we diversify our cropping system and produce several crops so that total gains from the production of many crops are maximized. It necessitates that the allocation of limited resources to different crops should be guided by some economic performance criteria of which the international competitiveness stand out to be the most critical. It brings in the principle of comparative advantage to use it as a guiding factor in the allocation of scarce resources. So comparative advantage and policy analysis are of crucial importance for planners, policy makers, administrators, price fixing authorities and others concerned with the farming sector, to know whether or not current set of policies are consistent with the comparative advantage . The study was conducted to determine international competitiveness of Pakistani cotton and to assess that how far the current sets of policies are consistent with existing pattern of comparative advantage.

MATERIALS AND METHODS

Scope of the study

The study covers the analysis of two major producing regions i.e. Punjab and Sindh provinces of Pakistan, for the period of five harvesting years from 1998-99 to 2002-03. The provinces were selected on the bases of their contribution to total cotton production. The Punjab accounts for 79 per cent in area and 78 per cent in production. The corresponding shares of Sindh were 20 and 22 percent, respectively (APCOM, 2003). In our study, production cost estimates were based on the secondary data obtained from Agricultural Prices Commission (APCOM). The data were also supplemented by domestic and international prices of inputs and outputs to get representative budgets for cotton crop. The data collected were analyzed by using the Domestic Resource Cost analysis (DRC), Nominal Protection Coefficient analysis (NPC) and Effective Protection Coefficient analysis (EPC) through the Policy Analysis Matrix (PAM) approach given in Table 1.

Table 1. Policy Analysis Matrix (PAM)

	Revenues	Costs		Profit
		Tradable Inputs	Domestic Factors	
Private prices	A	B	C	D
Social prices	E	F	G	H
Policy transfer	I	J	K	L

Source: Monke and Pearson (1989)

Private Profitability D	=	A – (B+ C)
Social Profitability H	=	E – (F+G)
Output Transfers I	=	A – E
Input Transfers J	=	B – F
Factor transfer K	=	C – G
Net policy transfers L	=	D – H

The approach was used to determine international competitiveness of Pakistani seed cotton and the effect of current set of policies on the existing pattern of comparative advantage of Pakistani cotton. The PAM is based on estimation of budgets using market prices and social prices. The basic format of the PAM is a matrix of two way accounting identities, one set defining profitability and the other defining the difference between private and social values of a commodity system.

Nominal Protection Coefficient (NPC)

The efficiency of pricing a commodity in a country is measured using the NPCs. The NPC is a measure of the extent to which domestic price policy protects domestic producers or consumers from the direct input or output of foreign markets (Tsakok, 1990). The NPC is calculated as a ratio of domestic price to border price, that is

$$NPC_i = P_i^d / P_i^w$$

Where NPC_i is nominal protection coefficient of the commodity i, P_i^d is domestic price of commodity i and P_i^w is world reference price of commodity i, adjusted to transportation, handling and marketing expenses.
In the PAM context,
NPC (on output) = A/E
NPC (on input) = B/F
Where, A and E are revenues evaluated at domestic and border prices of the output, respectively. B and F are cost of tradable inputs evaluated at domestic and border prices, respectively. If NPC is equal to one, then the domestic market price equals world price and therefore, there is no protection and the price is efficient. If the NPC is greater than one, then there is positive protection of output. If the NPC is less than one, then there is negative protection on output.

Effective Protection Coefficient (EPC)

The EPC goes a step further by incorporating tradable inputs into the analysis in such a way that it measures the ratio of value added at domestic prices (A – B) to value added at world reference prices (E- F). Conceptually this ratio can be written as

$$EPC_i = V_i^d / V_i^w$$

where,

EPC_i is effective protection coefficient of commodity i, V_i^d is value added at domestic prices and V_i^w is value added at world reference prices. Using PAM elements,

$$EPC = (A - B)/(E - F)$$

A value of EPC greater than one indicates a net subsidy to value added. The EPC ignores the transfer effects of factor market policies like NPC.

Domestic Resource Cost (DRC)

The domestic resource cost (DRC) is a measure of relative efficiency of domestic production by comparing the opportunity cost of domestic production to the value generated by the product (Tsakok, 1990). This ratio can be used to compare different economic activities in terms of social costs of domestic resources. The measure is calculated as the ratio of the cost of domestic resources and non-traded inputs of producing the commodity to the net foreign exchange earned or saved by producing the good domestically. In the PAM context

$$DRC = G/(E - F)$$

A DRC of less than one indicates efficiency of producing the good domestically because the country both saves on foreign exchange of importing it and therefore, has a comparative advantage in producing it. A DRC of greater than one indicates inefficiency in domestic production since the country incurs costs in excess of what it gains from the production of the good in terms of net foreign exchange. The country, therefore, gains by importing the commodity. A DRC of one indicates a balance, in which case country neither gains nor saves foreign exchange through domestic production.

RESULTS AND DISCUSSION

DRC Analysis: The Measure of Comparative Advantage

DRC analysis is a more practical measure of comparative advantage. The DRC ratio can be used to compare different activities in terms of social costs of

domestic resources employed in earning or saving a unit of foreign exchange. The smaller the social cost of domestic resources used to yield a unit of foreign exchange, the more efficient is the use of scarce resources by the country. The analysis showed that DRC coefficients for Pakistan vary between 0.26 and 0.33 which confirms the results of earlier studies (Appleyard, 1987; Khan and Ashiq, 2002) about Pakistan's overwhelming competitiveness in seed cotton production. The average DRC coefficient of 0.30 reflects that we earn/save one rupee by employing our domestic resources of Rs. 0.30 in seed cotton production. The comparative analysis of the two cotton producing regions depicts that in terms of comparative advantage Sindh has an edge over Punjab (Table 2).

Table 2. Domestic Resource Cost (DRC) Coefficients of Seed Cotton

Year	Punjab	Sindh	Pakistan
1998-99	0.26	0.27	0.26
1999-00	0.29	0.25	0.27
2000-01	0.41	0.25	0.33
2001-02	0.39	0.24	0.32
2002-03	0.35	0.28	0.32
Average	0.34	0.26	0.30

Historically, Sindh has been the leading province in cotton production due to its natural and geographic location i.e., its proximity to Karachi port, the international trade outlet.

Nominal Protection Coefficient (NPC): The Indicator of Policy Effects

Nominal Protection Coefficient (NPC), a simplest indicator of policy effects, is defined as the ratio of domestic price of commodity to its border parity price, where the border parity price is defined as the price in the international market converted into local currency through an exchange rate As an indicator of policy effects, NPC value less than one indicates that production of a particular commodity is taxed. Conversely, if the value of NPC is greater than 1, it suggests that a country is producing that commodity inefficiently and that price is being affected by the government policies or other factors.

Table 3 shows that the value of the Nominal Protection Coefficient (NPC) which ranges between 0.45 and 0.65 for both the cotton producing regions and thus for the entire Pakistan.

Table 3. Nominal Protection Coefficients (NPC) of Seed Cotton

Year	Punjab	Sindh	Pakistan
1998-99	0.65	0.66	0.655
1999-00	0.45	0.45	0.45
2000-01	0.65	0.65	0.65
2001-02	0.65	0.65	0.65
2002-03	0.64	0.65	0.645
Average	0.61	0.61	0.61

The analysis suggests that farmers of seed cotton are receiving prices less than world reference prices and seed cotton production and exports are heavily taxed. The average NPCs of 0.61 for Punjab and Sindh, however, shows that farmers are equally taxed in both the provinces.

Effective Protection Coefficient (EPC): The Indicator of Policy Effects

The effective protection coefficient as an alternate indicator to NPC, captures not only the policy effects on input or output prices but also net impact of all policies on value added of agricultural production systems,. It reveals the degree of protection accorded to the value added process in the production activity of the relevant commodity. The effective protection coefficient can be defined as the ratio of distorted value added at market price to an undistorted value at border prices. As a summary measure of incentives or disincentives caused by government policies both in input and output markets, the value of EPC greater than unity implies price protection and positive incentives to the producer, while the opposite is true when EPC is positive but less than unity. If EPC is equal to one, the structure of protection is neutral. Producers neither favored nor discriminated against. The coefficients of effective protection given in Table 4 indicate that inputs as well as output (seed cotton) remained heavily taxed in both regions throughout the study period, as the value of Effective Protection Coefficient (EPC) ranges between 0.33 and 0.60 for both regions. The results depicted that on an average, output and inputs are more heavily taxed in Punjab as compared to Sindh. This quantitative analysis collaborates with the earlier empirical studies and the practice of government of Pakistan to production and export of the most bonanza cash crop of country (Appleyard, 1987; Khan and Ashiq, 2002).

Table 4. Effective Protection Coefficients (EPC) of Seed

Year	Punjab	Sindh	Pakistan
1998-99	0.59	0.60	0.60
1999-00	0.33	0.34	0.34
2000-01	0.58	0.60	0.59
2001-02	0.56	0.59	0.58
2002-03	0.57	0.58	0.57
Average	0.52	0.54	0.53

CONCLUSIONS

The study using PAM approach, measures the international competitiveness of seed cotton in Pakistan and determines whether or not the existing policies are consistent with the existing pattern of production and export Overall results of the study depict that Pakistan under WTO regime has comparative advantage in producing seed cotton as major export crop. However, agricultural policies are not consistent with the existing comparative advantage. Seed cotton production is heavily taxed.

The findings of the paper suggest exploiting available potential in the cultivation of cotton to cater the local needs as well as for the earning of foreign exchange. Concerted efforts are needed to improve performance of cotton production and processing sectors. In the face of emerging WTO challenges macroeconomic policies need to be conducive, for which following are suggested.

In order to achieve growth in output and exportable surplus, it seems necessary to raise the commodity price to world level. Government intervention in agricultural commodities markets is against the spirit of trade liberalization and must be replaced by creating regulated private marketing system.

At par with reform of commodity markets, the efficiency of input delivery system should also be improved. Black marketing, under invoicing and sale of sub standard fertilizers, pesticides and seeds should be eradicated through strict punitive actions, open market sales and breaking up of monopolies of registered dealers and government.

The grading and standardization of the products to bring them at par with international standards must be ensured. Pakistan should invest heavily in storage, packaging, grading and procurement and delivery system technologies for an effective entry to export market.

Along with other factors the total productivity of the crop depends on the quality of seed. There fore production and provision of quality seed must be ensured

Sales tax regime should be revisited in order to reduce cost of production. Reduction in sales tax will help reduce cost of production.

However the benefits of trade reforms accruing to Pakistan are heavily dependent on the response of developed countries to reform measures especially in terms of opening up of their markets, reduction of subsidies and support to agriculture, withdrawal of export subsidies and removal of quantitative restrictions, tariffs and taxes on import from Pakistan.

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