INTERFERENCE OF LOCALIZED PRODUCTION SPECIALIZATION WITH ECONOMIC DETERMINANTS OF CROPPING PATTERNS: A CASE STUDY OF SOME MAJOR EXPORT CROPS IN EGYPT

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Abstract

In order to explore the interference extent of non-economic factors upon Egyptian farmers' crop production plan, benefit-cost ratios, net revenues and domestic resources costs were estimated and their viability tested in variant productive areas for major export crops. The distorting influence of non-economic factors upon response toward profitability potentials in crops acreage specification was revealed. Marketing problems, uncertainty and fear of risk beside specialization expertise may be the most interfering non-economic factors. As such, price raises and/or cost funding may not be sufficient to encourage production expansion for strategic crops unless considering the well-established production habits. Specifically considering cotton, regaining its past position in international markets requires much effort paid to solve its marketing problems and not only bid up its farm-gate prices.

Keywords: Egyptian export crops, net revenue, benefit-cost, domestic resources cost, Spearman's rank correlation, Pearson's correlation coefficient.

1. Introduction

The major target of any producer, farmers included, is maximum profit. On the other hand, the state's principal target is maximum production of major crops whether for domestic consumption or exportation. However, fulfillment of these targets may be affected not only by their possible mutual conflicts, but also by other non-economic factors, especially production habits mostly generated by prevalent environmental conditions.

In view of these respects, the study tends to investigate the influence of the non-economic factors, featured by spatial specialization, upon the effectiveness of economic determinants of cropping patterns. The example used was of production of major export crops in their principal productive governorates of Egypt.

2. Problem

Farmers may be influenced by factors related to their local conditions that affect their cropping patterns decision making, inflicting full realization of either their production targets or those of the state. The extent of such interference has not been assessed.

3. Objectives

The main objective is an attempt to assess the impact of non-economic factors related to the agronomic zone on the farmers' response to economic determinants governing acreages specification of certain major crops. The ultimate goal is detection of the best zones for specialization in production of those crops as fulfilling both the farmers' and the state's goals.

4. Methodology

Rice, cotton and potatoes were selected as the most important export crops of Egypt. Their major productive governorates are Beheira, Dakahlia, Kafr El-Shiekh, Gharbia, Sharkia and Menofia. Benefit-cost ratios (B/C) and net revenue (NR) were estimated as producers' profitability criteria, while the domestic resources cost ratios (DRC) were estimated for the comparative advantages as basis for export preferences. To test the linkage strength with areas of the selected crops, both Pearson's and Spearman's correlation coefficients were estimated wherever most appropriate.

Secondary published data sources included Egypt Ministry of Agriculture (MOA), the Central Agency of Public Mobilization and Statistics (CAPMAS) and UN Food and Agriculture Organization (FAO). Several related internet web sites were among adopted data sources.

5. Results and discussion

Export crops' major productive areas:

Nearly 81% and 84% of total acreages of cotton and rice, respectively are produced in four governorates; Kafr El-Shiekh, Beheira, Dakahlia and Sharkia. As for potatoes, Beheira and Dakahlia followed by Menofia and Gharbia shared altogether almost 72% of its total area[5,6,7,8]. In most of the selected governorates, maize is the most competitive non-exportable crop.

Indications of profitability and export potentials in producing governorates:

Table (1) presents the estimated B/C and DRC ratios for the crops concerned in the selected governorates (2010-12). It shows that cotton presents the lowest B/C and the highest DRC estimates in Kafr El-Shiekh, indicating as such the least encouraging for production for both the farmer and the state.

Table (1) – Estimated B/C and DRC ratios for the selected crops in major Governorates (2010-12)

Crop / Gover.	Rice		Cotton		Potatoes		Maize
	B/C	DRC	B/C	DRC	B/C	DRC	B/C
Beheira	2.04	0.228	2.0	0.518	1.49	0.283	2.02
Dakahlia	2.16	0.236	2.41	0.340	1.44	0.291	2.43
Kafr El-Shiekh	-	-	1.38	0.683	-	-	1.74
Gharbia	1.60	0.297	2.07	0.439	1.63	0.282	1.67
Sharkia	1.50	0.316	1.93	0.589	1.73	0.356	1.43
Menofia					1.50	0.298	1.79

Source: estimated from data of: (5, 6, 7&8).

Conversely, cotton had favorable both B/C and DRC ratios in Dakahlia. However, as shall be shown, reflection upon areas specified for each crop may be obstructed.

Acreage response to expected profitability and export potentials:

Assessment of farmers' response to expected profits and factors encouraging production of exportable crops adopted estimation of the correlation between either (B/C_i / B/Cj), (NRi/NR_j) or $DRCi/DRC_j$ with (a_i/a_j), where B/Ci , B/C_j, NRi, NR_j, DRCi and DRC_j are the estimated benefit-cost ratios, net revenue and domestic resources cost ratios of crops i and j, respectively, while ai and aj are their respective acreages. Due to the limited number of observations, Spearman correlation coefficients were estimated except for the overall competition of all considered crops for all selected governorates, where Pearson correlation coefficient was more proper. Table (2) presents the estimated results.

As shown in table (2), the economically logic area response to profitability criteria was distorted in all cases except for potatoes and maize competition and between all competitive crops neutralizing as such the specialization effect . However, the logic response to DRC As shown in table (2), the economically logic area response to profitability criteria was distorted in all cases except for potatoes and maize competition and between all competitive crops neutralizing as such the specialization effect . However, the logic response to DRC estimates was maintained. It is explicitly observed that cotton was common in the distorted relationships indicating the impact or other than revenue levels upon acreage specification for cotton in particular. This conclusion is sustained by the single bilateral case of logic impact not involving cotton, i.e. potatoes vs. maize. Where the export competition is involved, other factors than farm-gate prices may be influential.

Table (2) – Estimated correlation coefficients between economic criteria ratios and acreage ratios of the selected crops

Criteria	Cotton / rice	Cotton / maize	Cotton / potatoes	Potatoes / maize	all
B/C	-0.5	-0.95	-0.5	0.8	0.56
NR	-0.25	-0.97	-0.5	0.7	0.66
DRC	-0.7	-	-0.62	-	-0.73

Source: estimated from data of: (5, 6, 7&8).

Yield standards could not interpret the specialization or production habits impact for two reasons. First, high yields would reflect upon revenues supporting the economic factor impact. Secondly, governorates of highest yields do not necessarily have the greatest areas. As example, Menofia governorate has the highest cotton yield but the least acreage. Problems connected with cotton marketing, especially since the government ceased to intervene, may explain farmers' tendency to produce less of the crop regardless of its relatively higher net revenue, where uncertainty seems to be the ruling factor. On the other hand, facilities provided to farmers by exporters may explain the maintained logic impact of the DRC as related to comparative advantage. Such facilities include credit offers, down payment, provision of certified seeds, and most of all, purchase guarantee. Other non-economic factors involve production habits which may be governed by long time experience and avoidance of risk bearing. On the other hand, the relatively low estimates of Pearson's correlation coefficients for both B/C and NR for all competing crops may be explained by the relatively great dispersion of the selected crops acreages among the considered governorates.

6. Conclusions

The study revealed effective interference of non-economic factors in acreage specifications of major crops in Egypt. Accordingly, expansion encouragement for certain major crops might need not only price raises, but also considering other factors, especially prevalent production habits dictated by long term expertise and fear of risk bearing and uncertainty. Marketing conditions seem to be crucial determinants. As such, planning for production promotion of strategic crops should take into consideration such factors in addition to prices and production costs, and choice of production zones should be where such factors are in favourable conditions. Likewise, tendency to expand cotton's area would be futile unless efforts are paid to solve its marketing problems, both domestically and internationally.

7. References

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