# CONTRIBUTION OF AGRICULTURAL EXPORTS TO THE GREEK ECONOMY AND SOME POLICY INDICATORS

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## 1. INTRODUCTION

The last decade, Greek government devoted a great deal of its effort to improve the trade deficit in agricultural products, in order to stimulate the economic growth and to support the agricultural sector. The trade deficit in agricultural products for 1983, has been reduced to 737 million drachmas (drs.) from 4.6 billion in 1981. This improvement of the trade balance in agricultural products helped to offset part of the huge overall deficit. In addition, Greek farmers have derived substantial benefits from an export market that accounts for one-fiftn of the total value of farm product. What is not captured, is the impacts of agricultural exports on the economy, such as on total product, income, employment and tax revenues. Moreover, the impact on the economy of processing, and non-processing agricultural products has not been identified. To the present no attention has been given to the degree of agriculture's integration with the rest of the economy and to the impacts of export trade from a specific sectors on the economy.

This paper attempts to estimate the contribution of agricultural exports (processed and non - processed exports) to the national economy by assessing the output and income effects. Moreover, some indicators and multipliers are developed for evaluating political priorities by comparing agricultural and selective nonagricultural sectors (trade, construction and textiles - clothing).

1. Agriculture is broken down into two sectors. Agricultural processing sector includes food,- beverages and tobacco industries; the non-processing agriculture is called agricultural production sector.

Policy makers must achieve a better understanding of how export activity is integrated with the national economy, in order to evaluate the consequences of changing levels of agricultural exports on the Greek economy.Available input-output information (Skountjos and Matheos 1975) f^r the National economy was utilized, first to estimate internal purchases indices, in order to evaluate the interdependency of the economy, and second to study the output and income multiplier effects brought about by export sales.

## 2. MULTIPLIERS AND OTHER INDICATORS

The input/output transactions table gives a descriptive picture of the structure of the economy. It illustrates income, output, imports, exports, intermediate and final demand and transactions for each sector of the economy. Researchers devoted substantial work in estimating various indicators, in order to evaluate the «vitality» of each economic sector (Leontief 1963, Bomley 1972, Pagoulatos et al. 1981) Multipliers and Internal purchases indices indicate the significance of each sector for the economy. Furthermore, multipliers can be utilized in calculating impacts and distribution impacts (Mattas et al. 1984).

Multipliers measures the impact of change effecting the final demand of a sector on output, income, and employment for the entire domestic economy. Manipulation of the input-output matrices allows the researcher to derive different types of multipliers, depending on his primary interest. Output multipliers are the column totals of the total requirements matrix (B). Income multipliers (W) can be estimated from :

$$W_{(nx_1)} = (R_{1(1xn)} * B_{(nxn)}/R_{1(nx_1)} \quad (1)$$

where : $R'_1$ = the vector of sectorial income per output unit,

n = the number of the sectors.

(/) = denotes element division.

(') = denotes transpose matrix.

TABLE 1.

GROSS PRODUCT, INCOME AND EXPORTS DISTRIBUTION[a]

(1975 prices)

| | Gross product | | Income | | Exports | |
|---|---|---|---|---|---|---|
| agricultural production | 155[b] | 15[c] | 11[b] | 5[c] | 7[b] | 6[c] |
| agricultural processing | 98 | 9 | 9 | 4 | 14 | 13 |
| trade | 106 | 10 | 13 | 6 | 7 | 6 |
| construction | 89 | 8 | 25 | 11 | – | — |
| textiles-clothing | 98 | 9 | 10 | 4 | 11 | 10 |
| the entire economy | 1074 | 100 | 68 | 100 | 110 | 100 |

(a) : source : KEPE

(b) : values in billion drs.

(c) : percentages

* : indicates values less than half billion drs.

2. In this paper the term multiplier is referred to the type I multiplier. Type II income multiplier is proportional to the type I income multiplier (Boisver 1984). Hence, the ranking of the sectors in terms of type I or type II income multiplier is the same.

Internal indices (Bromley 1972) indicate the extend to which intersectora\ linkages can transmit impacts throughout the other sectors of the economy. It is important to identify a reliable indicator of the linkages between a given sector and the rest of the economy. An economic shock of a sector with a high internal purchases index, will be followed by successive rounds of intersectoral transactions that will cause substantial change in all other sectors. Moreover, research has shown a high correlation with both income and employment multipliers, (Mattas et al. 1984). Hence the internal purchases indices can be considered as indicators of the multiplier magnitude where data, or computer limitations do not permit the estimation of income miltipliers. The vector of internal purchases indices (Ip) can be estimated from :

$$I_{p(nx1)}=(I_{(1xn)} * {}_{(nxn)}) * T_{(nxn)})/X'_{(1xn)}$$

where : I = denotes a vector of l's

T = The transaction matrix

X = The vector of sectoral output

Internal purchases indices, and total income effects are estimated for those five sectors (Table 2).

TABLE 2.

MULTIPLIERS AND OTHER INDICATORS

| | Internal purchases | Output multipliers | Income multipliers | Total Income effect |
|---|---|---|---|---|
| agricultural production | .29 | 1.47 | 2.02 | .14 |
| agricultural processing | .64 | 2.00 | 2.66 | .24 |
| trade | .19 | 1.29 | 1.55 | .19 |
| construction | .46 | 1.76 | 1.57 | .46 |
| textiles-clothing | .73 | 2.40 | 4.70 | .30 |

## 3, EFFECTS OF EXPORTS ON THE GREEK ECONOMY.

Thus far, the significance of the sector has been determined by the magnitude of the exports (Table 1). Export activity generated 110 billion drs. in 1975, the five sectors undes investigation contributed 39 billion drs. This figure constitutes 10 per cent of the economy's Gross output. The agricultural processing sector is the leading sector in terms of exporting value followed by textiles-clothing. Agriculture contributed 19 per cent of total exports and textile-clothing. 10 per cent of total exports.

The ultimate effect of agricultural exports extends beyond the exporting value of each sector.(Pagoulatos et al. 1982). Since sectors differ in regard to their interdependencieswith other sectors, the introduction a of new monetary unit of income, within the economy, will generate a total effect depending on that sector's linkages with other sectors. Some sectors, for example, will exhibit strong linkages because they purchase large amounts of their inputs from othes firms. Other sectors will exhibit weaker linkages, because they import a large percentage of their inputs, or they purchase only small amounts of labor services fsom the domestic economy.

In order for decision makers to evaluate the overall impact of agricultural export sales, and particularly the processing and non-processing of agricultural products, it is necessary to have information concerning the linkages of the various sectors. That information given by input - output table (KEPE 1975) facilitates the estimation of input - output multipliers and internal purchase indices for the economy.

Internal purchases indices, income effects and multipliers are estimated by utilizing equations (1) and (2), for the two agricultural and three non-agricultural sectors (see Table 2). The first column indicates the internal purchases index for each sector; the second and third column, the output and income multipliers respectively, and the last one the total income effect. Textiles-clothing and agricultural processing sectors indicate a very high internal purchases index. Agricultural processing sector purchases 64 per cent of their input requirements (out of labor) within the economy. On the other hand, the agricultural production sector buys 29 per cent of its input requirements within the economy. The processing agricultural sector has considerably higher output multiplier than the agricultural production sector, due to higher indirect output effects. Agricultural processing sector's output impact is almost equiveiant to those of the textile-clothing sector, one of the most

3. The vector $(Rj - B)_{ixn}$ (némerator of the equation 1) gives the income effects.

dynamic sectors of the Greek economy. Therefore, an expansion of the agricultural processing sector is desirable, and is producing a high output growth. Moreover, any decline of processed exports, or even an increase with a decreasing rate, must, be identified in advance, otherwise indirect impacts will cause problems on the economy.

Income multipliers are high for both the agricultural processing sector, and the agricultural production sector. Assuming that a given growth of agricultural processing industry adds one million drs. household income and a linear consumption function, then the economy's household will benefit a 2.66 million drs income. In the long run that income effect will grow further. Income effects (Table. 2) illuminate the contribution of processing agricultural industry in terms of exporting value growth; processing agricultural exports indicate almost double (.24/.14) income effects comparing with non-processing agricultural exports.

A better understanding of the significante of the agriculture expotrs is gained by a comparison of generated output and income impacts among two agricultural sectors, and there non - agricultural sectors, given a 10 million drs. increase in exporting value of each sector (Table 3). The results of this scenario, indicate that the textiles - clothing sector, and the processed agriculture sector generate 24 million and 20 million drs. worth of output respectively, for the economy. A 10 million drs, increase in the exports of processed - food doubles the total output. Hence, the agricultural processing sector is identified as a sector of potential growth, and is vital for the economy in terms of generating Gross product. The construction and textiles - clothing sector has high impact on the Greek economy in terms of income, probably because of its connection with income intensive sectors. However, the agricultural processing sector adds 2.4 million drs. on the economy's income, which is considered as a relative high, given a 10 million drs. increase in exports.

TABLE 3

EXPORT ACTIVITY IMPACTS GIVEN A 10 MILLION DRS. INCREASE IN EXPORTS FOR EACH SECTOR

| | Output* | Income* |
|---|---|---|
| agricultural production | 14.70 | 1.40 |
| Agricultural processing | 20.00 | 2.40 |
| trade | 12.90 | 1.90 |
| construction | 17.60 | 4.60 |
| textiles - clothing | 24.00 | 3.00 |
| overall | 17.00 | 3.20 |

* million drachmas (1975 prices)

The ranking of the sectors in terms of the size of their multipliers is not the same with the ranking in terms of income increase, due to a 10 million drs. export increase. This happens because the multipliers express the income change of the economy resulting from a given change in a sector's income, and not from a given change in the final demand of this sector.

The indicators of Table 2, along with the export estimates (Table 1) for 1975, were utilized to evaluate the overall impact of the export sectors on the Greek economy. Results are presented in Table 4. The output column indicates the total amount of output which was generated within the economy for each sector, after rounds of subsequent spending, resulting from that sector's direct and indirect exporting activity. The income column indicates the amount of household income (wages, salaries, profits) which was generated within the economy because of exports, after all round-ups had happenned.

Export activity generated 187 billion drs. worth of business output, and 35.£ billion drs. worth of household income in 1975. These total figures constitute 17.5 per cent of the total Gross output, and 51 cent of the total household income (for 1975). Agricultural (processed and raw) export activity generated 38.29 billion drs. business output and 4.34 billion drs. household income. That constitutes 3.6 per cent of the total Gross output of the Greek economy, and 6.4 per cent of the total household income. The impacts of processed agriculture due to export activity outran output and income impacts of all five considered sectors.

TABLE 4

IMPACTS OF 1975 EXPORT ACTIVITY

| | Output* | Income* |
|---|---|---|
| agricultural production | 10.290 | 980 |
| agricultural processing | 28.000 | 3.360 |
| trade | 9.030 | 1.330 |
| construction | 2 0 | 5 |
| textiles-clothing | 26.400 | 3.300 |
| overall | 187.000 | 35.200 |

* in million drachmas (1975 prices)

It is clear from the results that the most important exporting sector in terms of generating output and household income was agriculture. Agriculture accounted for 9 per cent of household income, and for 19 percent of the exporting value in 1975. (tu, the impacts of agricultural exports on household income and output activity was considerably higher, amounting to about 12.33 per cent, and 20 per cent respectively. It is worth while to underline that agriculture processed has substantially higher impacts than the raw agriculture.

## CONCLUSIONS

This study investigated the impacts of agricultural exports on the Greek economy, by utilizing policy indicators derived from input-output information for the year 1975. Agricultural exports constitute 19 per cent of the total export value. Moreover agriculture is highly connected with the rest of the Greek economy. Agriculture indicates high output and income impacts on the economy. After accounting for all multiplier repercussions, the agriculture exporting activity was responsible for the 3.6 per cent of the total Gross output and 6.4 per cent of the total household income. Agriculture was by far the most important sector in ferms to either output or income impacts. It is extremely important to realize the substantially higher output and income impacts of the agricultural processing sector in comparison to any other sector.

Unambiguously, the policymakers should focus their effort on an expansion of exporting processed agricultural products instead of raw ones. Ultimately, this expansion will generate the most desirable output and income effects for the Greek economy. The results of this paper should challenge the policy makers toch reconsider trade policy issues. The study represents a beginning. Further research will offer a better understanding of the contribution to the Greek economy of rapidly increasing agricultural exports.

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