EGYPT'S EXPORT DIVERSIFICATION: BENEFITS AND CONSTRAINTS

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EXPORT diversification is often a primary objective of many developing countries. When economies are dependent on just one export commodity, their foreign exchange position is frequently precarious. Price fluctuations in export markets may make implementation of development projects difficult, as foreign exchange earnings cannot be relied upon. Some economists such as Raul Prebisch have even suggested there is a long-term tendency for primary product prices to decline vis-à-vis those for manufactured goods [20]. Insofar as this is the case, some diversification out of primary product exports into secondary goods is clearly desirable.

Despite the apparent desirability of export diversification, only a few developing countries have actually managed to achieve it to any substantial degree. Two main reasons can be advanced for this failure. Firstly some economists blame difficult conditions in export markets. Protectionism in the industrialized world is viewed as a major constraint on successful export diversification. Secondly economists who subscribe to a structuralist viewpoint believe that supply constraints within the developing countries themselves inhibit diversification.[1]

Ultimately the issue of who is correct can only be settled by reference to empirical studies. If the price elasticity of export supply is low, then the structuralist arguments would appear to have some support. The relationship between exports and domestic market production is also crucial. A positive relationship would suggest that exports can be expanded without domestic production for the internal market being sacrificed. Domestic production externalities may even aid exports. A negative relationship would suggest opportunity costs are involved in exporting. The latter would give further support to the structuralist case that supply side considerations are the major factor preventing export diversification.

In this study Egypt's recent experience of export diversification will be examined. Historically raw cotton was the country's major export, indeed Egypt's export trade was often depicted as a classic case of monocrop dependence [19, pp. 216 ff.]. In recent years however Egypt has tried to diversify into manufactured cotton goods and alternative agricultural produce to cotton. How successful has this policy been? Have prices of these alternative exports been higher and

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[1] An explicitly structuralist explanation for underdevelopment was first adopted by a group of Latin American economists. For a survey of their ideas, see [21, pp. 147–95]. For a more recent textbook discussion, see [17, Chaps. 15 and 17].

more stable than those of raw cotton? Does Egypt's experience shed any light on whether supply side factors are the major constraint on export diversification, which would validate the structuralist position?

A. *Diversification Trends*

During the last decade oil replaced cotton as Egypt's major export. The oil sector however has few linkages with the rest of the economy. Its major contribution has been in terms of foreign exchange earnings, but these, like raw cotton earnings, have been subject to considerable fluctuations, although Egypt benefited substantially from the oil price rises of 1973–74 and 1979. Oil development was not part of a conscious export diversification policy, but rather it was due to fortuitous circumstances. In the longer term its future seems uncertain, as Egypt's oil reserves are much more limited than those of its Arab OPEC neighbors such as Libya and Saudi Arabia. For this reason this study is concerned with non-oil exports. These represent so-called Ricardo goods, in which Egypt has a comparative advantage. Oil falls into a separate category, its exploitation being determined by resource availability rather than through any deliberate policy of specialization.

The diversification being studied has taken two forms. Firstly there has been the substitution of manufactured cotton goods such as yarn and thread, woven cloth, and even made-up clothing for raw cotton [3]. This represents vertical diversification as a result of downstream investment within an individual commodity category.[2] The second form of diversification has been through the substitution of alternative crops for raw cotton. These alternatives include vegetables such as potatoes and onions, citrus fruit (especially oranges), and rice. This agricultural diversification is of a less integrated kind, as there are fewer backward or forward linkages than is the case in the cotton industry. The move in agriculture can be characterized as horizontal rather than vertical.

The changing composition of Egypt's cotton exports over the 1965–80 period is depicted in Figure 1. The shares indicated represent proportions of total cotton exports by *value*. It appears the share of raw cotton in total cotton exports has declined, while the share of cotton manufactured goods has increased. This trend is particularly apparent from 1974 onward, although the substantial fall in the share of raw cotton in 1978 reflected a poor cotton harvest, together with a fall in raw cotton prices. The rises in the share of raw cotton in 1979 and 1980 are best viewed as a return to the underlying trend. Any continuing long-term tendency for raw cotton to decline in relation to total cotton exports will only be confirmed however when more data becomes available for the 1980s.

Figure 2 shows how the composition of Egypt's major food exports has evolved over the 1965–80 period. As with cotton, value data was used, and hence the changing shares reflect both relative price and relative volume shifts. The tendency for the share of rice in major food exports to decline is clearly depicted. The steady rise in the relative value of exports of oranges is also evident, despite

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[2] For general discussion of industrialization policies in Egypt, see [14] [6].

Fig. 1. Composition of Egypt's Cotton Exports
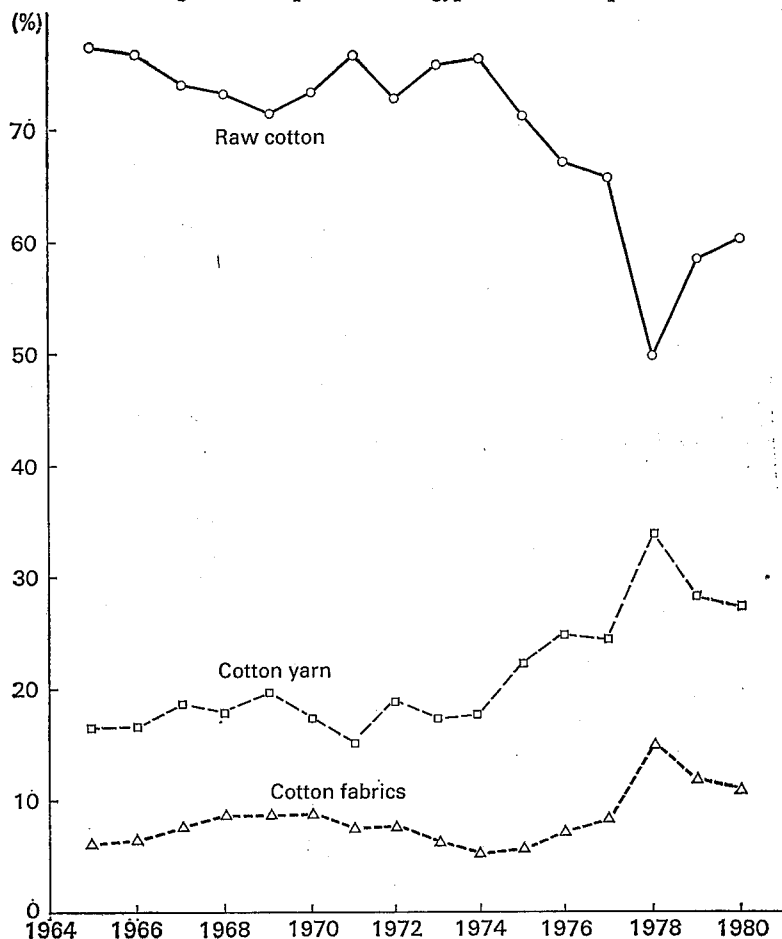
Sources: National Bank of Egypt, *Economic Bulletin*, Vol. 27, No. 4, Table 2-3b
(p. 359); Vol. 34, No. 4, Tables 2-4b, 2-4c, and 2-4d (pp. 332–34).
Note: Percentage shares estimated by author. Figure compiled by Jill Peters.

considerable year-to-year variations. There has also been a marked tendency
for potatoes to increase in significance over the period and as Figure 2 shows,
by 1979 they were comparable in importance to both oranges and rice. The
share of onions has in general declined over the period, although the greatest
declines were between 1967 and 1969, and later from 1973 onwards, with a
slight revival in 1980.

B. *Export Price Trends*

One means of ascertaining whether Egypt's export diversification policy has
brought benefits is to compare price trends for raw cotton with those of the
other export commodities into which the country has diversified. Price trend
lines were estimated for raw cotton and cotton manufactured goods, as well as
for alternative agricultural produce to cotton. The results are presented in

Fig. 2. Composition of Egypt's Major Food Exports
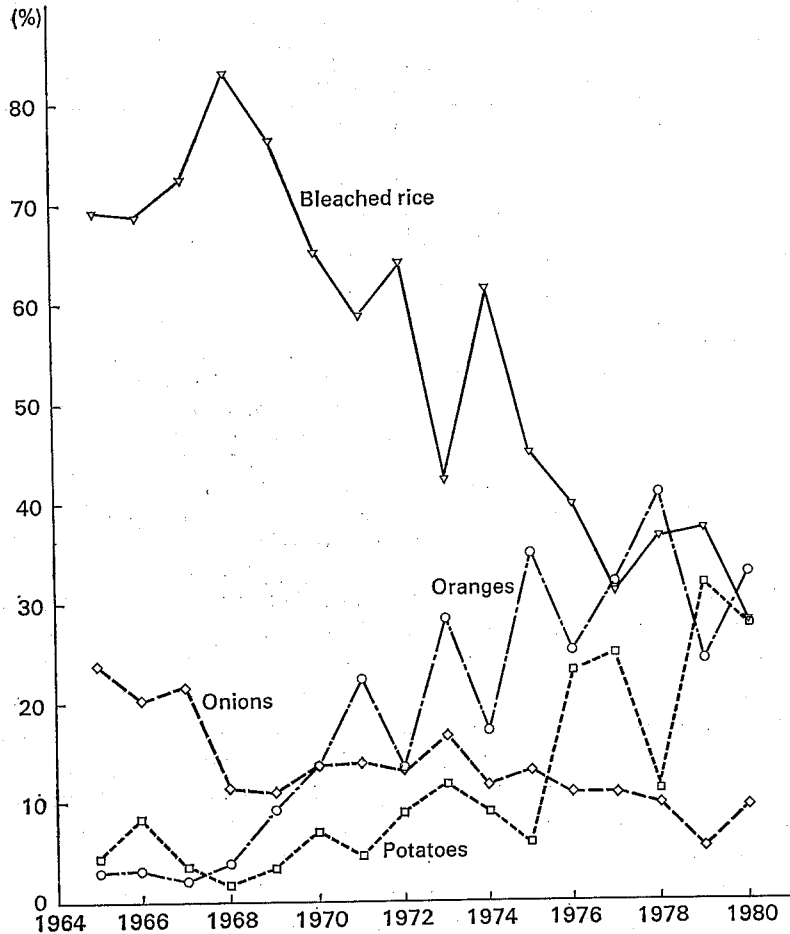
Source: See Figure 1.

Table I. The greater the slope of the trend line, the more favorable the price movement. As the prices are in money terms, all the slopes are not surprisingly positive. It is however relative slopes which matter, not the absolute slope values. Hence the interest is in how cotton yarn has performed relative to raw cotton, not how each has fared in isolation. Furthermore, insofar as the increase in input prices does not vary from commodity to commodity, the greater the relative price increase, the higher the relative profitability of the particular commodity. It seems reasonable to assume that input cost trends are similar for all the agricultural commodities considered. In addition although wages for urban textile workers are higher than those for rural cotton pickers, the rate of wage increase has been comparable over much of the period.

An important underlying assumption in any case is that prices are independent of costs, prices reflecting world market trends, while costs are determined by local market conditions. Thus higher world prices mean higher profitability as

TABLE I
EXPORT PRICE TRENDS AND STABILITY INDICATORS, 1969-79

Commodity	Slope of Trend Line	t-Value of Slope Parameter	MacBean Index	Coppock Index
Raw cotton	14.4	(3.95)	15.2	17.4
Cotton yarn	25.2	(5.03)	15.1	17.5
Cotton fabrics	27.4	(3.42)	10.4	13.6
Clothing	23.7	(6.74)	15.3	23.6
Bleached rice	17.4	(11.23)	53.0	48.1
Potatoes	24.9	(5.77)	19.7	18.9
Oranges	14.1	(3.01)	6.3	15.0

Source: [22, various issues].

Notes: 1. Indices estimated by author. Slope of linear trend line is parameter b, where trend is $Y=a+bX$, estimated by OLS regression.
2. The MacBean index is calculated by estimating the average annual percentage deviation from a five-year moving average.
3. The Coppock index is calculated by taking average annual percentage deviation from an estimated trend variable. Coppock's trend is also estimated by OLS, the log of exports representing the dependent variable, and time the independent variable. See [15].

long as the commodities produced can be sold. This latter issue will be examined further when the relationship between production and prices is considered.

The data source was the United Nations International Trade Statistics, which provide details of trade flows by dollar value and quantity. This international source was used, as when lengthy runs of data are needed, discontinuities are often present in the Egyptian statistics. The United Nations statistics follow the Standard International Trade Classification (SITC), while the classification used in Egypt has been changed frequently. The use of dollar values had advantages, as it avoided the question of which exchange rate to use, with Egypt maintaining both official and parallel market rates throughout the 1969–79 period covered. Problems of exchange rate depreciation and devaluation were also overcome.[3] As the Egyptian authorities are mainly interested in the foreign exchange value of their exports, or their import purchasing power, the use of dollar values seemed more appropriate in any case.

All the slope parameters were significant from the trend estimations as the t-values reported in Table I show. From the results it is evident that the price trends were much more favorable for manufactured cotton goods than raw cotton. The differences between cotton yarn, cotton fabrics, and clothing were relatively slight, although of course the nearer each of these manufacturing stages approaches a final finished product, the greater the value added which accrues to Egypt. Thus even if the export price trends are similar, there may be a preference for exporting clothing rather than an intermediate good such as cotton yarn.

The results for alternative agricultural produce to raw cotton were more mixed. The slope of the trend line for bleached rice was only slightly higher than that for raw cotton, indicating only a marginal price advantage for bleached rice over

[3] For a discussion of exchange rate policy in relation to export, see [1, pp. 287-306].

the 1969–79 period. As input costs are higher for rice in terms of fertilizer application, and manpower requirements are also higher, the advantage of rice cultivation must be open to question. In addition rice requires more irrigation water than raw cotton, which implies a high opportunity cost, as water is the major constraint on Egypt's agricultural production. Although there is no charge for water use at present, there is certainly a social cost that existing input pricing policy in agriculture fails to take into account.

Potato prices rose much more sharply than those of other major agricultural exports as the slope of the trend line reported in Table I indicates. Because of its mild winter climate, Egypt can grow potatoes over this season when European farmland is lying fallow. Egypt is able to market its potatoes in the European Community in February and March, some months before European early potatoes appear. At this time prices are much higher than in summer, and Egyptian early potatoes can sell at up to three times the price of the aging European potatoes from the previous summer and autumn harvests. Competition for the lucrative European early potato market is increasing however, especially from Cyprus and the Canary Islands. Spain's proposed accession to the European Community is of particular concern to Egypt's potato growers.

Egypt's exports of oranges have fared much less favorably over the 1969–79 period from a pricing point of view. The price rise for oranges has been less than that for any other agricultural commodity. Competition is intense in citrus export markets, especially in the European Community, where Israel and Morocco are major external suppliers. Both these countries are much larger producers and exporters than Egypt. Israel's citrus policy has a major impact on prices in the European Community, and rather than trying to compete, a large proportion of Egypt's exports are sent to the COMECON states. Citrus production and packing is extremely labor-intensive however, and Israel with its high wages is trying to diversify into higher value fruit and vegetable exports, particularly grapefruit and avocadoes, as well as more exotic vegetables such as Chinese cabbages. This may present some opportunities for Egypt in the European Community market if Israel concentrates on these alternative produce. The quality of Egyptian oranges is extremely high, but export consignments often arrive in poor condition due to careless packing. If Egypt is to take advantage of opportunities in the European Community market, such deficiencies will have to be overcome, as in contrast with sales to COMECON, meeting quantitative targets is insufficient for success.

C. *Price Stability*

Governments are of course not only concerned with relative trends in export prices, but also with the stability of export earnings. Hence although a comparison of long-term price trends is useful, fluctuations in prices are also usually a consideration. There may be a trade-off between price levels and price stability, with governments prepared to accept lower export prices, if they are accompanied by greater earnings stability. In Table I two measures of price stability are

reported, the MacBean index and the Coppock index.[4] Both indices show that the price fluctuations for cotton yarn and thread exports were not markedly different from those for raw cotton exports, despite the generally higher increase in the level of prices for the latter during the 1970s. The results for woven fabric exports are even more revealing. Although there was little difference between the price trend for cotton fabrics and that for yarn and thread, prices were more stable for woven fabrics regardless of which of the fluctuation measures was used. This would seem to indicate that further downstream diversification into woven fabric exports would have been worthwhile. The merit of increasing local value further and exporting clothing is however more debatable. Although the price trend was more favorable for clothing, both instability indices point to much higher price fluctuations. In fact the Coppock index reveals considerably greater instability for clothing even than that for raw cotton. This may be due to the varying composition of clothing types, as such finished manufactured exports are often much less homogenous than raw materials or even intermediate goods.

Although price rises were slightly greater for bleached rice than for raw cotton as already indicated, fluctuations in rice export prices have been considerable over the 1969–79 period, as both the MacBean and Coppock indices reveal. Given this price instability, the tendency for bleached rice exports to decline in relation to other major agricultural exports is perhaps not surprising. In fact even the volume of rice exports has declined over the period. This decline does not reflect falling production however, but the greater local consumption of rice by Egypt's rapidly increasing population. Hence although there has been some sacrifice of exports, the domestic consumption of locally produced rice has resulted in significant foreign exchange saving, since most of Egypt's domestic grain requirements are met by imported supplies.

Potato exports have performed favorably not only from the point of view of long-run pricing trends, but also with regard to price stability. Although there have been some year-to-year fluctuations in prices, these have not been much greater than those for raw cotton, especially if the Coppock index is used for comparison. This would seem to indicate that Egypt's policy of encouraging exports of vegetables such as potatoes has some justification. In contrast, diversification into oranges would seem to have been less worthwhile as far as long-run price trends are concerned, as already indicated. Nevertheless Egypt's orange export prices were more stable than those for any other agricultural export, in fact the value recorded for the MacBean index is remarkably low.

D. Export Constraints

The effectiveness of any policy aimed at export encouragement will of course

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[4] Much of the pioneering work on export instability was done by Joseph D. Coppock, author of *International Economic Instability* (New York: McGraw-Hill Book Co., 1962). Alasdair L. MacBean advanced Coppock's work further in his book, *Export Instability and Economic Development* (Cambridge, Mass.: Harvard University Press, 1966). His evidence on instability is presented on pp. 34–57.

depend on what factors constrain export growth. One school of economists, the "trade pessimists," such as Ragnar Nurkse, believe that trade for periphery countries is not an "engine of growth" [18]. The world's industrial centers are failing to export their own growth to primary producers due to factors such as low income elasticities of demand for primary produce. In addition prospects for manufactured exports from developing countries such as Egypt are also poor as the industrialized countries are likely to take a restrictive stance on such exports to protect their own employment. Such trade pessimists had their fears confirmed by arrangements such as the multi-fiber agreement or the pressures on some developing countries to exercise "voluntary" export restraint to circumvent the rules of GATT.

Another school of thought believes that even under conditions of free trade, the developing countries would not be able to take advantage of the export opportunities available. Irving Kravis [11] provides support for this argument, showing that trade is at best a "handmaiden" of growth, and that internal factors were largely responsible for successful export growth. Kravis's evidence largely relates to the comparative experiences of the United States and India in the nineteenth century, and a range of developing countries in the post–World War II period. This study of Egypt's exports tends to support the Kravis viewpoint that internal structural factors are the main constraints on exports.

Even if trade's failure as an engine of growth in Egypt is primarily due to structural factors, this does not necessarily imply that the arguments of the trade pessimists are redundant. If internal constraints are eventually overcome, Egypt may then find external constraints become operative. Hence economists such as Nurkse may be proved correct in the final analysis.

In this study the relationship between exports and production for the domestic market is examined, as well as the relationship between export levels and export prices. Except in one case, domestic market production is calculated as a residual, by taking total production for each commodity and subtracting exports. As already indicated in the introductory section, a positive relationship between production for the domestic market and exports would show that the latter could be expanded without opportunity cost, and may even be indicative of favorable externalities. A negative relationship would, however, suggest that domestic market production is an export constraint, and that exports and domestic consumption are substitutes, not complements. If substitution is the dominant effect, the structuralist arguments would appear to be validated.

Further support for the structuralist position would be given by a low price elasticity of export supply, indicating that exports do not respond to external price stimuli, perhaps due to internal production constraints. A positive relationship between export prices and export levels was nevertheless expected. In practice the relationship was found to be negative for Egypt. The interpretation of this result raises further interesting questions. It may be that overseas demand for cotton falls when the price is high, thus resulting in a negative relationship between prices and production. In Egypt however it seems more probable that supply conditions largely determine the production level, and that demand fac-

tors are less important. If this is the case, a structuralist viewpoint must be accepted.

E. A Model of Export Determinants

In the investigation of the relationship between exports, production for the domestic market, and export prices, a regression model was applied in the case of each export considered. In formal terms the relationship postulated was:

$$X = aD_{-1}{}^{b} p_{-1}{}^{c},\tag{1}$$

where the dependent variable X is the volume of exports and the independent variable D is the volume of domestic market production, both measured in thousands of metric tons. The independent variable, p, is the price of the particular export in international markets. Both domestic production and prices were lagged for one period, as it is not possible to vary export volume immediately in response to production or price changes. The lagged form in any case provided a better fit for the Egyptian data tested. The parameters estimated were a, b, and c.

Production for the domestic market and export prices are assumed to be independent, otherwise the problem of multicollinearity might arise. This assumption is not so heroic in Egypt's case, as domestic prices are tightly regulated by the authorities, and bear little relationship to price trends in world markets. The latter are significant, however, for exports. Some exports are marketed privately, such as fruit and vegetables, and for these commodities it seems reasonable to assume that export price signals are important. Even for those exports regulated by the authorities such as raw cotton, manufactured cotton goods, and rice, international prices still play a role in export marketing and export production decisions. Those concerned with resource allocation for these state-controlled export commodities are well aware of international price developments, even if the actual producers themselves at farm or factory level are not.

For computational convenience equation (1) can be transformed into a linear form by taking natural logarithms:

$$\log X = a + b \log D_{-1} + c \log p_{-1}.\tag{2}$$

This log linear form is commonly used for estimates of import determinants,[5] and was used for export determinants by H. S. Houthakker and Stephen P. Magee [9]. In this study of Egypt's exports the logarithmic form was also found to be preferable to an ordinary linear regression in terms of the data fit. One advantage of the logarithmic form is that the estimates of the slope parameters represent elasticities of the dependent variable with respect to the independent variables. Hence in the case of the equation specified here for Egypt, c represents the elasticity of the supply of exports with respect to world market prices. The parameter b is a measure of the responsiveness of export supply with respect to domestic market production.

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[5] See [16, pp. 75–80] [7, pp. 200–225] [8, pp. 190–99].

F. *The Results and Their Interpretation*

The regression analysis was applied to raw cotton and manufactured cotton goods, including yarn and fabrics, as well as to alternative agricultural export crops to raw cotton. The results are presented in Table II. The data used were annual observations of export volume and domestic production volume recorded in the United Nations International Trade Statistics. United States dollar prices were calculated by dividing the current value of exports and production by the respective volumes recorded. The data runs used were longer than those for the price instability exercise. Pre-1967 value data in the United Nations International Trade Statistics were in Egyptian pounds rather than dollars. There were converted into dollars at the official exchange rate, which was used by the authorities for all cotton transactions and most other export contracts.

Two different runs of data were used for raw cotton prices, as well as two independent production indicators. The price data for raw cotton calculated from the United Nations value and volume data are referred to as Alexandria prices, as they represent an average of the prices Egypt obtained for its raw cotton exports, mainly the extra-long staple and medium-long staple varieties. The alternative prices were an average of those paid on the Liverpool market, which is the most usual proxy for a world cotton price.[6] The results shown in Table II appear to be broadly consistent whichever price run is used.

Egyptian domestic consumption data for raw cotton from the *United Nations Statistical Yearbook* was also used as a proxy for domestic production for the domestic market. As already indicated for the first two raw cotton results, production for the domestic market was calculated as a residual, by subtracting exports from total domestic production, some of which is shipped overseas, and some of which is consumed locally. Exports and domestic market production are therefore not independent, but this problem does not arise with the residual used, or with domestic consumption data. The domestic consumption data used for the independent production data proxy does not correspond however exactly with the residual used for the first two results. This is because the consumption figures relate to raw cotton used by the local textile industry for the manufacture of yarn. Some of this input is imported, as Egypt finds it more profitable to export a higher proportion of its high quality long and medium staple cotton, and import some lower quality short staple cotton for the local textile industry. The significance of this practice should not be exaggerated nevertheless, as at least four-fifths of local textile inputs were met from domestic raw cotton production during the period under review, and in some years there were no cotton imports.

The results in Table II show that domestic production of raw cotton appears to be a significant determinant of exports, the results being positive for both sets of price data when production for the domestic market is calculated as a residual. When the independent production data proxy is used, the result is still significant

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6 Price data from [4, pp. 380–404]. Statistics used from [13, Dec. 1965, Dec. 1969, Dec. 1973, Dec. 1978].

TABLE II

EXPORTS, DOMESTIC PRODUCTION, AND PRICES

Commodity	Period	Intercept Parameter	Responsiveness of Exports to Domestic Production	Price Elasticity of Export Supply	R^2	DW
		a	b	c		
Raw cotton	1960–77	5.00	0.14	−0.51	0.75	1.09
(Alexandria prices)		(14.08)	(1.96)	(−6.42)		
Raw cotton	1960–77	7.01	0.14	−0.60	0.79	1.02
(Liverpool prices)		(19.09)	(2.14)	(−7.35)		
Raw cotton (Alex. prices,	1948–79	6.26	−0.11	−0.45	0.68	1.33
independent production		(23.70)	(−2.01)	(−5.82)		
data)						
Cotton yarn	1958–75	−6.90	2.30	−0.69	0.90	1.28
		(−8.03)	(11.39)	(−4.62)		
Cotton fabrics	1947–79	9.26	−1.49	−1.02	0.81	2.08
		(9.41)	(−6.86)	(−6.69)		
Potatoes	1962–79	−2.06	0.98	−0.18	0.50	2.04
		(−0.60)	(2.20)	(−0.50)		
Bleached rice	1947–79	−5.23	1.36	−0.45	0.35	0.91
		(−1.57)	(3.10)	(−2.32)		

Source: See Table I.
Note: Parameters estimated by author by ordinary least squares regression analysis for equation (2) cited in text. Figures in parentheses are t-values, R^2 is the coefficient of determination, and DW the Durbin-Watson statistic.

as the t-value shows, but there appears to be a negative relationship between production and exports. As the variable used is in practice domestic consumption, this might suggest that the more raw cotton consumed locally, the less available for exports. This would appear to support the structuralist case that exports are constrained by domestic factors. The parameter value however is very small. Even in the first two cases where exports are positively related to domestic production, the parameter value would suggest the degree of responsiveness is minimal. Certainly it seems unlikely that there are any favorable externalities as domestic production expands which benefit exports.

In the case of cotton yarn not only does the large t-value suggest a highly significant relationship between production and exports, but the parameter value is higher than those for raw cotton. It seems probable that there are more favorable externalities for exports from domestic production at this stage of manufacturing than with primary production. There are both indivisibilities and economies of scale in cotton yarn production, and in addition fixed costs have to be covered regardless of the scale of production. In contrast in cotton fabric production there are fewer benefits for exports from a high level of domestic production. Fabrics can be produced on a much smaller scale than yarn, with many different types of weave. Hence little responsiveness between exports and domestic production might be expected, although the strong negative relationship actually found for cotton fabrics was rather unexpected. Certainly it must provide comfort for the structuralists. The result implies that the fabric requirements

of domestic consumers and the local clothing industry are at the expense of exports. Buoyant domestic demand in Egypt for fabrics by both high and low income consumers has obviously imposed opportunity costs in terms of lost foreign exchange earnings.

Exports of both potatoes and bleached rice appear to be positively related to domestic production, and in both cases the relationship is significant. Economies of scale are unlikely in Egypt in these two forms of primary production, and although fixed cost considerations and indivisibilities must be taken into account at the individual farm level, large-scale production is unnecessary for the mini-mization of costs. With potato production there may, however, be some exter-nalities between domestic sales and exports. As Egypt's potatoes are sold in the winter in Western Europe at premium prices, only the best are exported, while the remainder can be absorbed domestically. In the case of rice the positive relationship may be partly caused by falling production in the latter part of the period. As production falls, exports have also fallen, as output has been needed to satisfy domestic consumption. During the earlier part of the period there was in any case more incentive to export rice, but as the price results for the 1970s cited earlier with reference to Table I show, rice export prices were subject to considerable fluctuation and uncertainty.

The most robust results shown in Table II are those for the price elasticities of export supply. All the results are significant apart from that for potatoes as the t-values indicate, but instead of exports responding positively to price increases as might be expected, the relationship is negative throughout. This may be because Egypt has to export increased amounts of raw cotton, cotton manu-factured goods, and rice when prices fall, in order to compensate for foreign exchange shortfalls. The state lacks the resources to stockpile commodities when prices are low. Furthermore foreign exchange shortages have often been acute during the last two decades, with visible exports covering less than half of import payments even in 1980 [2, pp. 38–39]. In addition during the 1967–73 period Egypt suffered a serious loss of invisible earnings with the closure of the Suez Canal.

A further problem for Egypt is that although it is a minor cotton producer, accounting for only 4 per cent of world production, it is the second largest exporter after the United States [10, pp. 180–81]. Production remains concen-trated in extra-long and medium-long staple varieties, and it accounts for almost 60 per cent of world trade in the latter, and 40 per cent of world trade for these two types together. In years when the cotton harvest is plentiful in Egypt, the world price tends to be depressed. Hence price levels may be partly determined by export levels rather than vice versa as equation (1) implies. Egypt is not a major exporter of cotton yarn or fabrics however, as already indicated, and the country is certainly a price taker as far as rice exports are concerned. As the price elasticities of export supply are also negative for yarn and fabrics, as well as rice, this makes the explanation that export levels determine price less tenable.

The price elasticity values for export supplies are all well below unity, except

in the case of cotton fabrics as Table II shows. This indicates an inelastic response of exports to pricing factors, which lends support to the structuralist position that even if price factors were favorable in export markets, the responsiveness of Egypt's exports would be limited because of internal constraints. The elasticity values for raw cotton seem broadly comparable whichever price or production data run is used, and the value for cotton yarn is only slightly different. Potatoes seem to have the lowest negative supply elasticity, indeed this is the nearest to a positive result. As potatoes are marketed privately rather than through official channels, a positive response would seem most likely for this commodity. Indeed it is surprising that the favorable price conditions prevailing for potatoes in the 1970s, and the relatively modest degree of price fluctuation, did not result in a positive elasticity of export supply value.

G. Limitations of the Analysis

Although the regression analysis has produced some interesting results, they need to be treated with caution. The results were the best obtainable with the data available, but they are far from being satisfactory. The R^2 values in Table II indicate that the equations for cotton manufactured goods were reasonable fits, but the fit for potatoes was less adequate, and that for rice must be considered poor. Furthermore as is often the case with time-series analysis, the Durbin-Watson statistics reveal that autocorrelation cannot be ruled out. The values of the Durbin-Watson statistic are in the indeterminate range for raw cotton and cotton yarn, while in the case of rice the extremely low value suggests positive autocorrelation. Only cotton fabrics and potatoes seem to present no problems, as in these cases autocorrelation can be rejected.

In order to adjust for possible autocorrelation, the Cochrane-Orcutt procedure was used, and the results from this iterative technique are produced in Table III. A software package was used which provided for a re-estimation of the first observations, hence the number of observations was the same for each result presented in Table III as was the case in Table II. Use of the Cochrane-Orcutt procedure raised the R^2 values in all cases, which usually happens with this technique. Thus not too much significance should be attached to the result for rice despite the high R^2 value found. The Durbin-Watson statistics in Table III are satisfactory however, apart from the first case of raw cotton where Alexandria prices are used, with production for the domestic market estimated by the residual method already described.

H. Conclusions

If a structuralist explanation for trade pessimism is tenable, then it has trade policy implications for countries such as Egypt. Insofar as domestic factors constrain exports, there is little point in attempting to apply pressures on trading partners to liberalize their import policies. This may only aid a country's competitors in the short run, if they do not face the same internal constraints. Egypt's main export market is the European Community, with which a cooperation agreement was signed in 1977 [23]. Although this agreement is restrictive with

TABLE III

EXPORTS, DOMESTIC PRODUCTION, AND PRICES WITH COCHRANE-ORCUTT ADJUSTMENT

Commodity	Period	Intercept Parameter	Responsiveness of Exports to Domestic Production	Price Elasticity of Export Supply	R^2	DW
Raw cotton	1961–77	5.08	0.12	−0.46	0.96	1.17
(Alexandria prices)		(16.41)	(1.95)	(−4.13)		
Raw cotton	1961–77	6.78	0.14	−0.53	0.98	1.40
(Liverpool prices)		(15.3)	(2.75)	(−4.99)		
Raw cotton (Alex. prices,	1949–79	6.46	−0.16	−0.34	0.90	1.78
independent production		(16.07)	(−1.89)	(−3.52)		
data)						
Cotton yarn	1959–75	−5.82	2.04	−0.53	0.75	1.97
		(−5.02)	(7.57)	(−2.78)		
Cotton fabrics	1947–79	9.14	−1.46	−1.01	0.86	1.83
		(10.55)	(−7.66)	(−7.18)		
Potatoes	1963–79	−1.94	0.97	−1.16	0.60	1.91
		(−0.57)	(2.24)	(−0.44)		
Bleached rice	1948–79	−12.86	2.44	−0.13	0.78	1.89
		(−5.24)	(7.59)	(−0.87)		

Source: See Table I.
Note: Computations by same methods as previous table. The Cochrane-Orcutt procedure is used where a significant value of the Durbin-Watson statistic suggested autocorrelation. See [11, pp. 206 ff.].

regard to both cotton textile imports and agricultural produce, Egypt has been unable to fulfil even the limited quotas assigned to it by the Community for raw cotton and out-of-season food exports [5, pp. 106–7]. In the circumstances it is inappropriate to blame the European Community for Egypt's trading difficulties at the present time. Only if Egypt's internal constraints are overcome will the trading policies of the country's partners emerge as a factor limiting further export growth.

Despite some reservations about the results from this study because of data limitations, the methods of analysis appear both feasible and useful. It seems appropriate to test the arguments of the trade pessimists using single-country time-series data rather than cross-sectional studies. The validity of the structuralist explanation for trade pessimism is empirically verifiable. It also seems most appropriate to use disaggregated data for exports of individual commodities, production for the domestic market, and prices. If data are used for total exports of all commodity categories, together with some proxy for a suitable export price index, severe aggregation problems arise. Of course even in this exercise there are some aggregation problems. For example, prices of extra-long staple cotton and medium-long staple cotton do not always move in line. Nevertheless the export commodities considered here are fairly homogenous within their particular categories, and it is unlikely that aggregation problems are responsible for any shortcomings in the results.

The evaluation of the merits of export diversification by the estimation of export price trends and instability indicators appears to have been particularly fruitful. Diversification into cotton manufactured goods seems worthwhile from both the point of view of price trends and price stability. This would seem to support the Prebisch view that exports of secondary goods are preferable to primary produce. Food exports such as potatoes also enjoyed high export prices however relative to those for raw cotton, but those for oranges were much lower, and prices for bleached rice exports were particularly subject to instability. For all commodities except oranges the measures of price instability were broadly comparable whether the MacBean or Coppock indices were used. The divergence in the case of oranges did not affect their relative position as the export commodity with the most stable prices. It merely reflects the rather poor fit of the log trend line which the Coppock index uses, which makes the MacBean moving average method more appropriate in this case.

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