

# Alternative Trade Strategies and Employment in Cyprus\*

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## I. Introduction

As it is well known, many developing countries have shifted economic policies in the post-World War II period from what could be considered free trade policies to import substitution industrialization policies and then back, in some degree, towards free trade oriented policies.

Most studies of import substitution industrialization have focused on economic efficiency issues which emphasize the economic loss to the economy as a whole caused by protectionist policies.<sup>1</sup> Much less emphasis has been put on measuring the actual employment effects on various trade policies.<sup>2</sup> It is the goal of this essay to estimate such an impact in the case of the Cypriot economy.

Specifically, the analysis will proceed in the following manner:

1. A short history of Cyprus' trade regimes will be presented.

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1 See for example: Little, Sictovsky, and Scott (1970); Bhagwati (1974); Bhagwati and Krueger (1973); Krueger (1978); and Ballasa.

2 An exception is the National Bureau of Economic Research (NBER) project, *Alternative Trade Strategies and Employment*, Chicago Press, 1980 under the direction of Anne O. Krueger (1980).

2. For each of our three years of analysis -- 1962, 1967, and 1972 -- industries at the four digit ISIC level will be classified into Export, Import Competing, Non-Import Competing, and Non-Traded.

3. The employment intensity of each classification grouping will then be estimated in the form of: (a) direct employment per unit of domestic value added, (b) home goods indirect employment per unit of direct plus home goods indirect domestic value added, and (c) direct skill intensity.<sup>3</sup>

4. The effects of the different trade regimes represented by the three years in our analysis are tested by means of: (a) industry classification switches between years, (b) comparing the effective protection of the industries that switched classification to those that did not, and (c) comparing the employment and skill intensity of the industries that switched classification to those that did not switch.

Once the effects of the different trade strategies on employment have been analyzed, a set of possible policy recommendations will be made. These policy recommendations should prove useful to policymakers and the planning authorities.

## II. Cyprus Trade Regimes in Perspective

During the period since World War II, Cyprus has moved from a free trade strategy to an import substitution strategy and, finally, to an export promotion strategy. Three distinct periods are associated with these alternative strategies: (1) the period prior to 1962; (2) the period 1962-1966, comprising the First Five-Year Economic Plan; and (3) the period 1967 to the present, comprising the Second and Third Five-Year Economic Plans. In 1974, following the Turkish invasion of Cyprus, the Third Five-Year Plan was replaced with a series of Two-Year Emergency Economic Action Plans.

During the period prior to 1962 there existed almost complete liberalization in the external sector. Tariffs and taxes on imports and exports were low, and their only purpose was to provide revenue to the Colonial Government. This period was characterized by the lack of any coherent national trade strategy whatsoever.

<sup>3</sup> These concepts as used in this study are explicitly defined in the text.

Thus, it is not surprising that only a small amount of import substituting industry developed during this period.

The years 1962-1967 cover the period of the First Five-Year Plan, the trade policy of which was designed to reduce imports by "encouraging the development of those local industries that utilize raw materials -- or that process imported raw materials -- where the added value is considerable."<sup>4</sup> In effect, this policy resulted in the exemption of imported capital goods and industrial raw materials from customs duties. More specifically, nearly all plant and machinery was allowed duty-free plus a reduction of, or exemption from, import duties on raw materials and components used in manufacturing which are not locally available. Import substitution, thus, best describes this period.

The Second Five-Year Plan beginning in 1967 shifted the emphasis to export promotion.<sup>5</sup> This new strategy of export promotion has since gained momentum and was further emphasized in the Third Five-Year Plan and all subsequent plan. In its endeavor to promote industrial exports, the Government has taken a series of measures, the most important of which is a scheme for rebating import duties on certain raw materials and components used in manufactures which are exported. The devaluation of the Cyprus Pound in 1967, to maintain its parity with Pound Sterling, was in this respect not unwelcomed. Likewise, the various tax incentives for investment have been adapted to an export strategy.

The three years that are representative of the different trade strategies for which detailed census data were available are: 1962, 1967, and 1972. The year 1962 is considered representative of the free trade strategy period, 1967 represents the import substitution strategy; and 1972 represents the export promotion strategy.

### III. Industries Associated with Different Trade Strategies

Turning to the trade strategies -- employment relationships, two levels of analysis are of interest. First different trade strategies imply different compositions of output at each point in time. If a country follows an export promotion strategy, export industries

<sup>4</sup> *Economic Review* (1962), p. 14.

<sup>5</sup> *Second Five-Year Economic Plan* (1966), p. 149.

grow faster and vice-versa under import substitution. If employment requirements per unit of value added is greater in one set of industries than in the other, then employment growth would be faster on this account, than the strategy that lets the labor intensive industries grow relatively faster. Second, alternative trade policies could influence the choice of technique and capital/labor ratio in all industries, for example, though implicit subsidization of capital goods imports. If there is smooth factor substitution in production, then import substitution leads to greater capital use and lower labor use per unit of value added in all activities; and, therefore, employment will grow more slowly under import substitution.

In order to document the linkage between trade strategies and employment, an appropriate classification of industries is pivotal to our analysis. We have, therefore, adopted the approach of Krueger (1976) in attempting a four-way classification of commodities:<sup>6</sup>

1. Exports,
2. Import Substitutes,
3. Imports that do not compete with domestic production, and
4. Home Goods which would not be traded within the relevant range of price variation.

This procedure is one that entails gathering of data for each manufacturing branch on domestic production and consumption -- including all intermediate uses of the commodity -- for a period of time comparable with the period for which the trade statistics apply.<sup>7</sup> Three years, 1962, 1967, and 1972, are possible for our computation due mainly to the existence of a Census of Industrial Production for those years.

For each sector  $i$ , we compute the following statistic for each of the years 1962, 1967, and 1972:

$$t_{i, T} = \frac{C_{i, T} - P_{i, T}}{C_{i, T}} ; \begin{matrix} i = 1, \dots, 85 \\ T = 1962, 1967, 1972 \end{matrix}$$

<sup>6</sup> For a review of alternative classification schemes see Georgiou (1979).

<sup>7</sup> The International Standard Industrial Classification (ISIC) of manufactures is adopted and cross-classified with the Standard International Trade Classification (SITC) at the four-digit level of disaggregation. For a complete account of the procedure and other data specifications, see Georgiou (1979).

where:  $C_{i,T}$  = domestic consumption in sector  $i$ , for the  $T$ th year

$P_{i,T}$  = domestic production in sector  $i$ , for the  $T$ th year

$i$  = 85 four-digit ISIC manufacturing sectors

$T$  = representative years of alternative trade strategies: 1962, 1967, and 1972

Substituting and simplifying

$$C_{i,T} = P_{i,T} + M_{i,T} - X_{i,T}$$

where:  $M_{i,T}$  = imports of sector  $i$ , in the  $T$ th year

$X_{i,T}$  = exports of sector  $i$ , in the  $T$ th year

we obtain:

$$t_{i,T} = \frac{M_{i,T} - X_{i,T}}{P_{i,T} + M_{i,T} - X_{i,T}} \quad (1)$$

We then derive our desired four-way classification of commodities in the following manner:

1. if  $t_i$  is less than 0, the sector was classified as an Export
2. if  $t_i$  is greater than 0, and less than  $Z_1$ , the sector was classified as Import Competing
3. if  $t_i$  is greater than or equal to  $Z_1$  and less than or equal to 1, the sector was classified as Non-Import Competing, i.e., domestic production does not compete with imports
4. if  $M_i + X_i$  is negligible (i.e.,  $t_i = 0$ ), the sector was classified as Non-Traded

where  $Z_1$  is the cutoff point that separates the Import Competing commodities from the Non-Import Competing commodities, and will vary with the level of aggregation and the homogeneity of commodity aggregates.<sup>8</sup>

In the Cyprus case, the value 0.6 was chosen as the cutoff point,  $Z_i$ , because the  $t$ -statistic was concentrated on both sides of 0.6. Furthermore, since Cyprus has a very primitive industrial sector, the Cyprus ISIC classification is tailored around it and may not be directly compatible at a disaggregated level with the United Nations ISIC. In effect, this gives a downward bias towards the  $t$ -coefficients; therefore, a cutoff point of 0.6 was selected to

<sup>8</sup> Krueger (1976) suggests a possible  $Z_1$  value of 0.75. Thoumi (1978) in a similar study for Columbia uses a  $Z_1$  value of 0.4.

separate the true Import Competing branches from the Non-Import Competing branches, as opposed to a higher cutoff point which would be more appropriate for a larger and more industrialized LDC.

#### IV. Employment Effects: Direct and Indirect

Since the central aim of the study is to analyze the employment implications of alternative trade strategies, we will now proceed to estimate employment coefficients for our branch classifications. Attention in this respect will focus on the Export and Import Competing branches.

Direct labor requirements should be measured per unit of value added measured at domestic prices, where value added is the domestic output price less the cost of all purchased inputs per unit of output. Stated algebraically:

$$L_{i,T}^d = \frac{E_{i,T}}{V_{i,T} - N_{i,T}} \quad ; \quad i = 1, \dots, 85$$

$T = 1962, 1967, 1972. \quad (2)$

where:  $L_{i,T}^d$  = direct labor requirement per unit of domestic value added, in the  $i$ th activity, for the  $T$ th year

$E_{i,T}$  = employment in  $i$ , for the  $T$ th year

$V_{i,T}$  = domestic value of output in  $i$ , for the  $T$ th year

$N_{i,T}$  = domestic value of purchased inputs in  $i$ , for the  $T$ th year

$i = 1, \dots, 85$  sectors

$T = 1962, 1967, \text{ and } 1972$ , the years of our analysis

In addition to the direct employment effects given in Eq. (2) above, it is important to note that any expansion of a tradeable sector would require inputs from the home goods industries. Any expansion in a tradeable sector will generate indirectly value added, labor employment, and capital requirements in home goods industries. Therefore, the employment implications of a given trade strategy should be measured, taking into account the indirect effects in the home goods industries.

The appropriate concept for direct plus indirect labor requirements should be the direct labor requirements, as measured by Eq. (2), plus the requirements of labor used in home goods per unit

of value added, with value added itself adjusted to include the primary factors employed in producing home goods used in producing a unit of domestic currency output.

Expressed algebraically, indirect labor requirements in home goods,  $L_i^{IHG}$ , are:

$$L_i^{IHG} = \frac{a_{ih, T} E_{h, T} (V_{h, T} - N_{h, T})}{(V_{i, T} - N_{i, T}) + a_{ih, T} (V_{h, T} - N_{h, T})} ;$$

$$i = 1, \dots, 85$$

$$h = 1, \dots, 5$$

$$T = 1962, 1967, 1972 \quad (3)$$

where:  $a_{ih}$  is the input of home goods per unit of output,  $E_h$  is employment in home goods, and  $(V_h - N_h)$  is domestic value added in home goods. Of course, if home goods are an input into home goods,  $a_{ih}$  should be interpreted as direct plus indirect use of home goods per unit of tradeable and  $a_{ih}(V_h - N_h)$  should be domestic value added in "direct indirect" plus "indirect indirect" use of home goods.

To determine the indirect employment effects, five sectors were assumed to be home goods: Construction, Electricity, Commerce, Transport, and Services. After studying the I-O Table and the sectorial structure of the economy, it appeared that two underlying but conflicting forces were contributing to the indirect employment effects of the home goods sector. First, the I-O Table indicates an extremely small degree of inter-sectoral linkage in the Cyprus economy. This may be due to the small size of the economy, heavy reliance on trade, and a small industrial sector. Therefore, it was believed that this limited inter-sectoral linkage would limit the indirect employment effects arising from the Export and Import Competing sectors.

On the other hand, it is obvious from the structure of the economy that the home goods sectors account for a large proportion of GDP, i.e., 32.4% in 1962, 43.0% in 1967 and 46.2% in 1972. These sectors developed initially to service the British Military Bases and then maintained their momentum with the stationing of United Nations troops on the island together with rapid growth of tourism and the overall economy. Thus, given the growing importance of the home goods sectors in the economy, it

was believed that forces were also at work increasing the indirect employment effects of the Export and Import Competing sectors.

The direct and indirect employment generated per £ million of direct plus indirect domestic value added for our four branch classifications: Exports, Import Competing, Non-Import Competing, and Non-Traded are given in Table 1.

Table 1

DIRECT PLUS HOME GOODS INDIRECT EMPLOYMENT  
GENERATED PER MILLION POUNDS OF DIRECT PLUS HOME  
GOODS INDIRECT DOMESTIC VALUE ADDED IN EXPORT,  
IMPORT COMPETING, NON-IMPORT COMPETING, AND  
NON-TRADED INDUSTRIES AT CONSTANT 1972 PRICES

	1962		1967		1972	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Exports-1	456	139	355	143	573	247
Exports-2	304	132	310	138	316	161
Exports-3	1042	161	475	169	1028	299
Exports-4	629	125	512	71	1028	281
Import Competing	1166	350	988	466	887	494
Non-Import Competing	1431	373	1067	476	893	562
Non-Traded	1543	270	1257	355	1087	346

Source: Cyprus Data Base, derived using Eqs. (2) and (3).

Notes: Exports-1 = HOS Exports, as defined by Eq. (1).

Exports-2 = Large Scale Exports, i.e., 2110: Alcoholic Beverages, and 3899: Cement and Other Non-Metallic Minerals.

Exports-3 = Other Exports, i.e., Exports-1 minus Exports-2.

Exports-4 = Exports-3 minus 2091: Olive Oil.\*

\* Olive Oil is excluded in Exports-4 due to a very bad olive crop in 1962 which affected the Employment/Domestic Value Added coefficient for Exports-3.

On a Leontief type test of the HOS theorem, i.e., Cyprus trade with the rest of the world, we would expect that Cyprus Exports would be more labor intensive than Import Competing industries. Our initial results do not support this hypothesis. Exports-1, defined to include all HOS Exports, generated 456 jobs (139 indirect), 355 (143) and 573 (247) jobs per £ million of DVA in 1962, 1967 and 1972, respectively. The corresponding figures for Im-



port Competing industries were 1166 (350 indirect), 998 (466) and 887 (494) jobs, respectively.

However, on closer analysis of our export industries, we notice certain interesting facts. First, Cyprus Exports are very limited and concentrated, i.e., of 85 industries only 9 are classified as Exports in 1962, 6 in 1967, and 9 in 1972. Second, Alcoholic Beverages, and Cement and Other Non-Metallic Minerals, alone accounted for 65% of Exports in 1962, 73% in 1967, and 64% in 1972. Both industries are characterized by a relatively larger scale of production than the remaining Exports, and of course employ a much larger scale of production than the rest of the manufacturing sector. This leads us to believe that these industries would also employ relatively more capital intensive techniques of production than the remaining Exports and the rest of the manufacturing sector. It was, therefore, decided to further disaggregate our HOS Exports, Exports-1, into Large Scale Exports, Exports-2, i.e., Alcoholic Beverages, and Cement and Other Non-Metallic Minerals; and Other Exports, Exports-3.

When this is done, we get a labor intensity of Large Scale Exports, Exports-2, of: 304 (132 indirect) jobs, 310 (138) jobs, and 316 (161) jobs for each of our three years. Obviously, this is lower than for Exports-1 for the reasons stated above. Furthermore, in the case of indirect employment effects, Large Scale Exports have fewer linkages with the rest of the economy than Other Exports. This is somewhat similar to the notion of a "modern" and a "traditional" sector. In the case of Other Exports, Exports-3, we get a much higher labor intensity of: 1042 (161) indirect, 475 (169), and 1028 (299) jobs for each of our three years, respectively.<sup>9</sup> In fact, in 1972, the direct labor intensity of Exports-3 was higher than that of Import Competing industries (1028 jobs versus 887 jobs). This might be the more relevant category for testing the results of our study in terms of the HOS theory.

However, no matter what definition of Exports we employ, on a Leontief type test of the HOS theorem we arrive at a "Paradox," i.e., Cyprus Exports are less labor intensive than Import Competing industries contrary to our expectations, given that Cyprus is a labor abundant country.<sup>10</sup> Even though we have a "Paradox"

<sup>9</sup> The high labor coefficient for Exports-3 in 1962 is due to a very bad olive crop in 1962 which inflated the E/DVA ratio. Consequently, Exports-4 was defined as Exports-3 minus Olive Oil.

<sup>10</sup> Cyprus is labor abundant compared to DCs that are Cyprus' major trading partners.

in the Cyprus case, this is not an identical Paradox to that of Leontief. In fact, this is a very different kind of "Paradox" for which all the possible "explanations" of the Leontief Paradox do not apply.

What we have in the case of the Cyprus "Paradox" is a country that is basically agrarian with an economy with many of the characteristics that typify an LDC. The year 1962, the first year of our analysis, represents this situation best. What we have in 1962 is an economy with an almost non-existent manufacturing sector. The relative prosperity that existed in Cyprus since World War II was due to the influx of money into the economy via the British Military Bases. As a result, the only sectors that showed any real growth were the Service sectors that flourished in servicing the Military Bases. In consequence, the manufacturing sector in 1962 was of the most primitive type and what little manufacturing existed was very labor intensive, since most investment until then was either in the Service sectors or else in luxury housing for which Cypriots have traditionally had a special taste.

In addition, and in contrast to this incipient manufacturing sector, Cyprus Exports were on a much larger scale and, consequently, more capital intensive. Traditional Cypriot Exports have been Minerals, especially copper and asbestos; Alcoholic Beverages, especially wine and sherry; and other agricultural products. In fact, Minerals accounted for over 50% of export earnings in 1962. These Export industries in 1962 were relatively more capital intensive than the almost non-existent and incipient domestic manufacturing industries. Given the Cypriot economy in this very early stage of economic development, we arrive at the paradoxical results of having Cyprus Exports being less labor intensive than Import Competing industries.

With the fast growth of the economy within the context of the Government's Five-Year Development Plans, the Cyprus manufacturing sector began to grow. This led to capital investment and increasing capital intensity within the manufacturing sector as is expected with an industrialization program, especially in the case where you start from practically nothing. As the Government emphasized first an Imports Substitution policy and then an Export Promotion policy, we see the Import Competing industries becoming less labor intensive as they accumulate capital; and we see the Export industries becoming more labor intensive as they seek to maintain traditional comparative advantage and break into new

export markets. In effect, while our results point to a special "Paradox" very different from that of Leontief, we also observe a trend in labor intensities towards confirmation of HOS predictions.<sup>11</sup>

In comparing the indirect employment effects over time, we see that these effects have been increasing over time throughout the economy in comparison to the direct effects that were increasing only in the Export sector. This implies increasing interlinkage in the economy and growing sophistication in production, in general. However, during this period 1962-1972, indirect employment increased by a much greater percentage in Exports than in the other manufacturing sectors and, in particular, by a much greater percentage than the Import Competing sector. The indirect employment intensity of Exports-1 increased 77.7% between 1962 and 1972, and Exports-3 increased 85.7% during that period. On the other hand, the Import Competing sector's indirect labor intensity increased only 41.4%, the Non-Import Competing sector increased 50.7%, and the Non-Traded sector increased 28.1% between 1962 and 1972, respectively.

In terms of the Government's trade strategies, under import substitution (1962-1967), labor intensity decreased throughout the economy with the biggest decreases coming in Exports, 22% for Exports-1 and 34% for Exports-3. In contrast, under export promotion (1967-1972) labor intensity in Exports increased substantially, 61% for Exports-1 and 116% for Export-3, while the labor intensity of Import Competing, Non-Import Competing, and Non-Traded industries decreased, 10%, 16%, and 14%, respectively.

## V. Wage and Labor Skills Associated with Different Trade Strategies

Labor skill requirements are expected to play a role in determining whether a commodity would be exported and whether the commodity would be exported to DCs or LDCs. Specifically, the HOS model predicts that a LDC's Export industries are likely to be less skill intensive than Import Competing industries, and Exports

<sup>11</sup> The "trend" mentioned here refers to the fact that during the 1962-1972 period, Exports-1 increased in labor intensity by 25.7%, while Import Competing industries decreased by 24.0%.

to DCs are likely to be less skill intensive than Exports to LDCs. Unfortunately, it is very difficult to theoretically define and empirically measure skills. In spite of these difficulties, it was decided to use certain proxy measures of skills. The proxy measures selected were the average labor remuneration per unit of labor, the ratio of white collar employment to blue collar employment, and the ratio of male employment to female employment.

Table 2 presents these figures for each of our branch classifications. From Table 2 we see that our first proxy skill variable shows increasing skill intensity throughout the economy over time.<sup>12</sup> This is compatible with the direct employment results of Table 1 that show increasing capital intensity over time. This pro-

**Table 2**  
THREE PROXY SKILL VARIABLES FOR EXPORT,  
IMPORT-COMPETING, NON-IMPORTING COMPETING,  
AND NON-TRADED INDUSTRIES

	1962 <sup>1</sup>			1967 <sup>1</sup>			1972		
	$\frac{W^2}{E}$	$\frac{EW^3}{EB}$	$\frac{EM^4}{EF}$	$\frac{W}{E}$	$\frac{EW}{EB}$	$\frac{WM \cdot W}{EP \cdot E}$	$\frac{EW}{EB}$	$\frac{EM}{EF}$	
Exports-1 <sup>5</sup>	590	.30	2.50	602	.26	2.56	614	.40	1.23
Exports-2 <sup>6</sup>	680	.33	3.89	672	.30	4.82	841	.59	4.90
Exports-3 <sup>7</sup>	449	.24	1.39	459	.19	.97	491	.32	.66
Import Competing	384	.26	1.54	412	.25	1.14	549	.53	1.27
Non-Import Competing	350	.19	4.55	402	.20	3.05	595	.63	4.09
Non-Traded	328	.16	309.80	430	.23	6.84	592	.55	44.47

Source: Cyprus Data Base

Notes: <sup>1</sup> Firms engaging 5 or more workers

<sup>2</sup>  $W_{i,T}/E_{i,T}$  where:  $W_i$  = total wages in sector i, in the Tth year  
 $E_i$  = total employment in sector i, in the Tth year

<sup>3</sup>  $EW_{i,T}/EB_{i,T}$  where:  $EW_i$  = white collar employment in sector, i in the Tth year  
 $EB_i$  = blue collar employment in sector i, in the Tth year

<sup>4</sup>  $EM_{i,T}/EF_{i,T}$  where:  $EM_i$  = male employment in sector i, in the Tth year  
 $EF_i$  = female employment in sector i, in the Tth year

<sup>5</sup> Exports-1 = All HOS Exports

<sup>6</sup> Exports-2 = Large Scale Exports

<sup>7</sup> Exports-3 = Exports-1 - Exports-2 (Other Exports)

vides evidence that capital and skills or "human capital" are complementary. More importantly for our study, the results of Table 2 show that while skill intensities are growing over time, the skill intensity of Exports is growing at a slower rate than other sectors of the economy and, in particular, slower than that of Import Competing industries. Between 1962 and 1972 the average wages in the Exports-1 sector increased 3.7% and in the Exports-3 sector it increased 9.4%, while the increase for Import Competing, Non-Import Competing and Non-Traded sectors was 43.0%, 70.0%, and 80.5%, respectively.

In terms of the alternative trade strategies during this period, we see that during the import substitution period, 1962-1972, average wages increased 1.7% in Exports versus 7.3% for Import Competing industries. During the export promotion period 1967-1972, however, while average wages increased only 2.0% in Exports, they increased 33.3% in Import Competing industries. If wage differentials are an adequate proxy for skills, this means that the skill intensity of Exports is growing at a much slower rate than in Import Competing industries; and, furthermore, this difference is much more obvious under the export promotion strategy. In addition, it can also be stated that as the industrialization process continues, the "easy" import substitution activities have been undertaken first, which leads to increasingly high-cost capital and skill intensive industries.

The results for the second and third proxy skill variables, white collar to blue collar employment and male to female employment, parallel in general terms those of the other proxy skill measures; and the same trends are manifested over time by the other skill variables. Naturally, one has to bear in mind when interpreting these skill proxies that over the time period 1962-1972, average wages were increasing throughout the economy, white collar employment was outpacing blue collar employment and females were entering the labor force at a faster rate than males.

In general it appears that in a Leontief type framework, i.e., Cyprus against the world, skill intensities in manufactures are in agreement with and reinforce our conclusions derived from our analysis of direct and indirect employment of the previous section.

<sup>12</sup> It is possible that a rising K/L ratio for the economy as a whole will raise the wage of unskilled labor, but the average industry wage will still reflect the average skill level of a particular industry.

Summing up the results of our analysis of labor skills in Cyprus manufacturing, with the results of the direct and indirect employment analysis in mind, we conclude that: (a) in a Leontief type test of the HOS theorem we arrive at a "Paradox" theoretically equivalent to that of the Leontief Paradox but, in fact, very different for which all the traditional explanations do not apply, and which has an explanation uniquely its own; (b) HOS Exports were increasing in labor intensity, but were unable to surpass the labor intensity of Import Competing industries, although the trend is in that direction. Furthermore, the skill intensity in Exports is growing at a slower rate than in Import Competing industries; (c) Cyprus manufactures were becoming increasingly capital and skill intensive over time, providing evidence that skills and capital are complementary as expected; (d) while labor intensity was decreasing in Cyprus manufacturing throughout this period, 1962-1972, during the export promotion period, 1967-1972, labor intensity in Exports increased substantially relative to Import Competing industries that continued their decline; (e) indirect employment effects have been increasing throughout the economy but at a faster rate in Exports than in Import Competing industries or other manufacturing sectors; and finally (f) the evidence appears to show that the Government's trade strategies were effective in influencing the labor intensity of production.

## **VI. Switches in Industry Classifications Due to Switches in Trade Strategy**

### *Changes in the t-Coefficient and the Composition of Trade*

First, we take the base year, 1962, industry classification given by the  $t$ -coefficient of Eq. (1). We then observe the industries that switched classification between 1962 and 1967, a period in which import substitution policies were in full force. We then observe the industry classification switches between 1967 and 1972, a period in which export promotion policies were emphasized. It is to be expected that the trend would be a movement of industries from the Non-Import Competing category to the Import Competing category in the import substitution period, and a movement from the Import Competing category to the Export category in the export promotion period. The industries that actually made the switch will now be treated to more detailed analysis.

It is, of course, possible that the prevailing trade regime although effective, was unable to cause any or very few industry classification switches. An estimate of the trade regime effects on the domestic structure of production could be obtained by comparing the actual average  $t$ -coefficient for our various industry branches between years. It would be expected that the average  $t$ -coefficient for Non-Import Competing industries would decline during the import substitution phase, while the average  $t$ -coefficient for Import Competing industries would decline during the export promotion phase. During the import substitution phase, 1962-1967, the average  $t$ -coefficient for the Non-Import Competing sector declined, although insignificantly, from 0.92 to 0.90. Similarly, the Import Competing sector  $t$ -coefficient average declined, although again insignificantly, from 0.28 to 0.27 during the export promotion phase, 1967-1972. Although these movements were small, they were in the expected direction.

### *Effective Protection and Classification Changes*

To determine the strength or the effect of the trade regime during this period, we could use effective rates of protection (ERP)<sup>13</sup> to compare the industries that actually switched classification to those that did not. It is to be expected that low protection Import Competing sectors are more likely to become Exporters than the more protected ones. It is also expected that high protection Export sectors are more likely to become Import Competing than the lower protected Exports. Similar expectations can be stated regarding switches between Non-Import Competing and Import Competing sectors.

During the Import Substitution period the 7 Non-Import Competing industries (Tobacco Fumigation, Paper Products, Fur Tanning and Finishing, Perfume, Candles and Matches, Boat Building, Watches and Clocks) that turned Import Competing had an average ERP of 403% in comparison to the average of 148% for the Non-Import Competing sector as a whole. This shows that in order for these industries to become Import Competing, they received very high levels of protection from the Government. In addition, the Export industry (Halva) that turned Import Competing during this period had an ERP, 302%, much higher than the average for the Export sector, 135%.

13 See Demetriades (1975).

During the Export Promotion period, 1967-1972, the Import Competing industry (Footwear) that turned Export had an ERP, 204%, lower than the average, 215%, for the Import Competing sector. In addition, the average ERP, 197% of the 4 Non-Traded industries (Milk, Sugar Confectionary, Honey and Rubber Shoes) was also lower than the average, 215%, for the Import Competing sector. The levels of protection of these 4 Non-Traded industries are compared to that of the Import Competing sector because these industries are not really Non-Traded industries as we have defined them but industries that are in transition between the Import Competing and Export branch classifications. What happens is that an industry that is in the process of switching branch classification gets caught in transition when it is no longer importing but has yet to break into the export market or else it can no longer compete as an export, but is still managing to supply the domestic market.

It appears, then, that the trade regime of this period in terms of ERP levels had positive effects in furthering the policies of the Government, and the empirical results presented are in accordance with HOS predictions.

### *Employment, Labor Skills and Classification Switches*

Finally, trade strategies can be tied to employment and skill intensities by analyzing employment intensities and our three proxy statistics for skills: labor remuneration, ratio of blue collar to white collar workers and ratio of male to female workers for the industries that switched classification between 1962-1972.

It is expected that Import Competing industries that switched classification to Exports have a higher employment intensity than the average for Import Competing industries. Similarly, it is expected that Export industries that turned Import Competing have a lower employment intensity than the average for Exports. In the case of skill intensities it would be expected that the Import Competing industries that turned Exporters would have a lower skill intensity than the average for Import Competing industries. In all cases, the empirical results verify these expectations. The 7 Non-Import Competing industries that turned Import Competing in the Import Substitution period have a higher level of employment per million Pounds of DVA than the Non-Import Competing sector (1934 jobs versus 1875 jobs) as expected. Furthermore, these



industries show a lower level of skill intensity than the Non-Import Competing sector for 2 of the 3 proxy skill variables: W/E, EM/EF; while for the third, EW/EB, the skill intensity is the same.

For the Export Promotion period we would expect that the Import Competing industry (footwear) that turned Export would have a higher labor intensity and a lower skill intensity than the Import Competing sector which is the case for all our variables. However, for the Non-Traded industries (Milk, Sugar Confectionary, Honey and Rubber Shoes) we have mixed results with the employment intensity being lower than the Import Competing sector, as well as one of the skill variables (EW/EB) being higher than the Import Competing sector. The other 2 skill variables, W/E and EM/EF, were lower as predicted. It could be questioned, however, whether Milk, Sugar Confectionary and Honey are HOS Exports since Milk serves the special Oil Exporting Middle East market and Sugar Confectionary and Honey serve expatriate Cypriot demand in the U.K. market.

Having analyzed the industries that switched branch classification during this period, we conclude that: (a) During the Import Substitution period the average t-coefficient of the Non-Import Competing sectors was declining. (b) During the Export Promotion period the average t-coefficient of the Import Competing sectors was declining. Both movements of the t-coefficient of the Import Competing sectors was expected in response to the alternative trade regimes although the size of the movements was not considered significant. (c) During the Import Substitution period the industries with higher ERP turned Import Competing. (d) During the Export Promotion period the industries with lower ERP turned into Exports. If the tariff structure represents the trade regime, then these results are also a measure of the effectiveness of the Government's trade policies. (e) Export industries that turned Import Competing during the Import Substitution period were less labor intensive than the average for Exports, and Non-Import Competing industries that turned Import Competing were more labor intensive than the average for Non-Import Competing industries. In the case of skill intensities the opposite was the case as expected. (f) Import Competing industries that turned Export during the Export Promotion period had a higher labor intensity than the average for Import Competing industries and a lower skill intensity as expected. These results are in accordance with HOS predictions and provide one more piece of evidence linking alter-

native trade strategies to employment and specifically linking the particular trade strategies of the Cyprus Government during this period, 1962-1967 and 1967-1972, to employment.

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