TRADE POLICIES AND RESOURCE ALLOCATION IN A SMALL ECONOMY: THE CASE OF TAIWAN

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I. INTRODUCTION

B ALASSA [1] and Krueger [4] show in their cross-country studies that some less developed countries (LDCs) which have switched their trade policies from import substitution to export promotion have generally enjoyed faster economic growth than others which have not. They attribute the higher rates of economic growth to the advantages, in terms of allocative efficiency, of export promotion. If this is the case, the so-called strategy of export promotion must have worked to reduce the distortions resulting from the scheme of import substitution, putting pressure on inefficient industries and providing incentives for efficient industries. It would be interesting to know more about the operation of these pressures and incentives. However, no empirical study has been made of an individual country in this aspect. This paper, which aims to fill this gap by studying the case of Taiwan, should contribute to the understanding of, first, the characteristics of an export promotion strategy that would work to improve allocative efficiency, and second, how this strategy may change allocative efficiency by inducing a change in the structure of industries.

Our concentration on allocative efficiency is primarily based on the consideration that economic growth of a LDC is closely related to whether it can successfully expand the supplies of capital and foreign exchange, which in turn depends on how the LDC may make efficient use of existing supplies. The more efficiently the existing supplies of capital and foreign exchange are used, the greater these supplies will become and the faster the economy can grow. In this study, we confine ourselves to examining the allocative efficiency in the foreign trade sector of Taiwan, for this sector has been strategically important in Taiwan's development process.

The story of Taiwan is of particular interest for two reasons. First, Taiwan embarked on export promotion as far back as the early 1960s, when most other LDCs were still sticking to the policy of import substitution. This early switch of trade policy makes it possible for us to study, for selected years, the impact of each trade policy on resource allocation. Second, Taiwan has been one of a few LDCs which have achieved high rates of output growth while improving their balance of payments at the same time.

In Section II of this paper, we review briefly the pattern of economic growth under the two different trade regimes in Taiwan and discuss the use of data in our analysis. Section III sets up a model for determining the efficiency of individual trade industries. Section IV analyzes the relationship between the switch of trade policy and the allocative efficiency of the foreign trade sector in Taiwan. Finally, Section V summarizes and concludes this paper.

II. TRADE REGIMES AND ECONOMIC GROWTH OF TAIWAN, 1952–71

In the 1950s, Taiwan, like most other LDCs, adopted the strategy of import substitution in dealing with the problem of trade deficits. Being newly free from the Japanese colonial regime, and separated from the mainland China, Taiwan lost its two major export markets and suffered a drastic decline in exports in the early 1950s. This unfavorable effect on the trade balance was further aggravated by a rapid rise in domestic demand for imports, as the economy's purchasing power was suddenly raised by the capital brought in with the refugees from the mainland China. Trade deficits swelled and once reached a level of 40 per cent of total imports.[1] To put the trade deficits under control, the government initiated the use of quotas, high tariffs, import licensing, a multiple-exchange-rates system, etc. to regulate imports. These measures remained in full force until 1957 when a foreign exchange reform was undertaken by the government. Nevertheless, a significant shift of the trade policy toward export promotion did not take place until the early 1960s when most of the restrictive measures were substantially liberalized and the export incentive scheme installed.

As shown in Table I, the government never did successfully contain the trade deficits with its import-control measures in the period from 1952 to 1961. This failure was an inevitable result of the following factors. First, the economy's exports, which were composed mainly of sugar and rice,[2] made very little growth as they were subject to rising domestic demand. Second, the rising demand for the import of capital goods and raw materials associated with the growth of import substitution industries kept total imports on a relatively steadily rising trend. The two different growth patterns of exports and imports are shown in Table I. Partly because of the government's inability to control imports, Taiwan's trade deficits, as can be seen from the import-export ratios in the same table, were as high as in the range from 43 to 127 per cent of exports.[3]

Under the protective scheme in the period from 1952 to 1961, Taiwan's economic growth was closely tied to the growth of import substitutes. In the early 1950s, the economy enjoyed a rapid output growth by taking advantage

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[1] See C. H. Yang, "The History of Changes in Taiwan's Balance of Payments and the Impacts of its Trade Policies," *Industry and Economy* (Taiwan), Vol. 2, No. 4 (January 1975).

[2] The percentage of sugar and rice in total exports was 78 per cent in 1953, and it gradually dropped to 34 per cent in 1961.

[3] Of course, trade deficits could not have reached such a high level without resorting to external finance. As shown in Table I, U.S. aid and other forms of foreign capital inflow was as high as around 40 per cent of the economy's total imports.

TABLE I

GNP, EXPORTS, AND IMPORTS OF TAIWAN, 1952–71

	Growth Rate of GNP (at 1966 Prices) (%)	Growth Rate of Exports (%)	Growth Rate of Imports (%)	R_1*	R_2†
1952	12.2	—	—	1.61	43.35
1953	8.9	10.34	2.67	1.50	37.62
1954	7.7	−27.34	9.90	2.27	56.47
1955	8.5	32.26	−4.73	1.63	34.48
1956	4.7	−4.06	−3.48	1.64	43.36
1957	7.8	25.42	9.28	1.43	35.91
1958	5.6	5.41	6.60	1.45	40.33
1959	7.0	0.00	2.21	1.47	41.11
1960	5.4	4.46	28.57	1.81	40.06
1961	7.7	18.90	8.42	1.65	28.00
1962	8.2	11.79	−5.59	1.39	33.68
1963	11.5	52.29	19.08	1.09	0.39
1964	13.3	30.42	18.23	0.99	−0.01
1965	8.2	3.93	29.91	1.24	1.64
1966	8.4	19.11	11.87	1.16	4.80
1967	11.0	19.59	29.58	1.26	8.31
1968	9.8	23.09	12.03	1.14	10.90
1969	9.2	32.95	34.33	1.16	3.72
1970	11.6	31.18	25.64	1.03	0.72
1971	10.9	39.10	21.00	0.90	−7.48

Source: Executive Yuan, Economic Planning Council, *Taiwan Statistical Data Book, 1974* (Taipei, 1974).

* The import-export ratio.

† The proportion of U.S. aid, foreign capital, and loans to the total imports.

of the existing domestic market available for new industries which took the place of foreign imports. This rapid growth went undisturbed by the existence of torrents of trade deficits because U.S. aid and other foreign capital poured in to help finance large proportions of the import of capital goods and raw materials. From 1952 to 1955, the economy maintained an average annual GNP growth of 8.5 per cent, a rate which was the envy of most of the other LDCs. However, in the years after 1955, the import substitution industries must have found increasing difficulty in expanding their sales in the domestic market.[4] Thus the growth of GNP was seen to follow a downward trend. The limited supply of foreign exchange had also become a constraint on economic growth, as the growth of GNP was seen to fluctuate rather closely with the booms and slumps of exports. The average annual growth rate of GNP in the period from 1956 to 1961 went down to 6.9 per cent, 1.6 per cent lower than in the period from 1952 to 1955.[5]

[4] The two fastest expanding industries in the period from 1953 to 1956 were electric appliances and textiles, whose growth rates for the period were 33 and 14 per cent respectively. But in the period from 1957 to 1960, the growth rate of electric appliances went down to 16 per cent and that of textiles went down to 9 per cent. See Hsing [3].

[5] It must be noted here that Taiwan would not have achieved such a high rate of output growth without U.S. aid to help finance its trade deficits.

In view of the fact that there was a declining rate of output growth and that
large proportions of trade deficits had to be financed by U.S. aid and other
foreign capital, the Taiwanese government was forced to move its trade policy
in the direction of export promotion. It began to institute some encouragements
for exports in the late 1950s, but these encouragements were both quantitatively
insignificant and narrow in coverage. It was not until the early 1960s when the
government foresaw an imminent withdrawal of U.S. aid[6] that a wide range of
export promotion devices was employed. Under the promotion scheme, (a) a
single exchange rate took the place of the multiple-exchange-rates system, (b) a
scheme was installed to relax gradually some quantitative restrictions on imports,
(c) the export procedure was simplified, (d) most manufactured exports were
provided with rebates of taxes on imported input,[7] (e) tax holidays and low-cost
export loans were made available for exporting firms, and (f) export processing
zones were set up to attract foreign capital. All of these measures, with the
exception of (e), worked to remove the bias of the existing protective scheme
against exports. The government was convinced that the removal of this bias
plus some incentives for exports would be sufficient to induce an expansion of
exports.

As shown in Table I, the growth of both exports and GNP in Taiwan during
the period from 1962 to 1971 (hereafter the second period) presents an entirely
different picture from that of the period from 1952 to 1961 (hereafter the first
period). The average annual growth rate of exports shot up to 25.2 per cent,
as compared to an average of 5.4 per cent in the first period. This expansion
of exports enabled the output of the economy to grow rapidly, with its imports
financed mainly by its own export revenues (Table I). The average growth rate
of GNP in this period reached 10.3 per cent per annum, 3 per cent higher than
in the first period.

The above review shows that the growth of exports and GNP was much more
vigorous in the period of export promotion than in the period of import sub-
stitution. Why did the switch of trade policy make such a big difference? It is
hypothesized here that this change arose because the strategy of export promotion
employed by the government of Taiwan "neutralized" the import substitution
bias created by the protective scheme and created a favorable environment for
the expansion of efficient export industries.

To test the above hypothesis, we make a comparison of the efficiency of
resource allocation in the foreign trade sector between the period of import
substitution and the period of export promotion. One year is selected from each
period: 1961 from the former and 1971 from the latter. For each of these two
years there have been published input-output tables and an industrial census.[8]

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[6] U.S. aid to Taiwan was withdrawn in 1965.

[7] For example, from 1961 to 1962 tax rebates for textiles increased by one time, clothing
by four times, lumber and plywood by four times and plastic products by ten times. See
Hsing [3].

[8] These data are: (a) Executive Yuan, Council for international Cooperation and Develop-
ment, Department No. 3, "Taiwan's Input-Output Tables, 1961," by T. Y. Liu, unpub-

In addition to this advantage, in each of these two years the trade policy must have already had substantial impacts on resource allocation, considering the number of years for which each trade policy had by then been in force.

The classification of trade industries in this study is based on that of the input-output tables, which contain forty-two industries for 1961 and seventy-six industries for 1971. Among these industries, those which exported more than 10 per cent of their domestic production and those whose imports supplied more than 10 per cent of domestic demand are classified as trade industries. As a result, we have sixteen trade industries for 1961 and thirty-nine for 1971. These trade industries are further classified into export and import substitution industries in accordance with the differentials that might exist between domestic and world prices for their products. The differentials are considered to be small for industries (a) which exported more than 30 per cent of their domestic production, or (b) which exported between 15 and 30 per cent of their domestic production but for which the competition at home was likely to force their domestic prices down below the prices permitted by the system of protection. These industries are treated as export industries and the rest of the trade industries as import substitution industries.

III. METHODOLOGY

To estimate the efficiency of individual industries in the foreign trade sector, we use Bruno's concept of domestic resource cost (DRC).[9] First let us consider an economy which is free of distortions and whose market prices reflect the opportunity costs of resources. We would term a trade industry efficient if its domestic resource cost of earning or saving one local currency unit (i.e., New Taiwan dollar or NT dollar) of foreign exchange is less than or equal to one NT dollar.

In our DRC estimate, the costs of all direct and indirect inputs which are locally produced will be taken into account. Let b_{jk} be the coefficient of factor k employed in industry j and W_k be the unit cost of factor k. An employment of one unit of input j therefore costs $\sum_k b_{jk} W_k$ NT dollars. Furthermore, if the production of one NT dollar of output i requires d_{ij} units of domestic input j, then the total domestic resource cost per NT dollar of output i is,[10]

$$DRC_i = \sum_j d_{ij} \sum_k b_{ik} W_k . \tag{1}$$

Since DRC_i represents the social costs of producing one NT dollar of traded

lished report (Taipei, 1964). (b) Executive Group of I.C.C.T., *General Report: 1961 Industry and Commerce Census of Taiwan, The Republic of China*, Vol. 1–4 (Taipei, 1962). (c) Executive Yuan, Economic Planning Council, Overall Planning Department, *Input-Output Tables, Taiwan, Republic of China, 1971* (Taipei, 1974). (d) Executive Yuan, Committee on Industrial and Commercial Censuses, *The 1971 Industrial and Commercial Censuses of Taiwan and Fukien Area: Republic of China*, Vol. 1–8 (Taipei, 1973).

9 See Bruno [2].
10 Constant costs is implicitly assumed in this formula.

good i or one NT dollar of foreign exchange, it would be a benefit to the economy if DRC_i is less than one and a loss if DRC_i is greater than one. Stated differently, industry i is efficient if earning (or saving) one NT dollar of foreign exchange calls for less than one NT dollar of domestic resources. Similarly, industry i is inefficient if earning (or saving) one NT dollar of foreign exchange calls for more than one NT dollar of domestic resources.

Now we relax the assumption of perfect factor and product markets by using shadow prices to replace market prices. For this purpose, world prices are taken to be the shadow prices of traded goods and domestic prices to be the shadow prices of non-traded goods.[11] However, since only domestic prices are given, the shadow prices of traded goods must be estimated through the estimation of the shadow exchange rate and the adjustment for the tariff. We use Bacha-Taylor's free-trade equilibrium rate of exchange as our shadow exchange rate (γ^*),[12] which is NT\$46.88 per U.S. dollar for 1961 and NT\$43.81 per U.S. dollar for 1971, and then, by using γ^*, convert the domestic prices (P_i) of traded goods into their shadow prices (P^*_i):

$$P^*_i = \gamma^* \frac{P_i}{(1+t_i)\gamma}, \text{ or} \qquad (2)$$

$$\frac{P^*_i}{P_i} = \frac{\gamma^*}{\gamma} \frac{1}{1+t_i}, \qquad (3)$$

where t_i is the nominal rate of tariff and γ is the actual exchange rate, which was NT\$40 per U.S. dollar in both years. Given P^*_i/P_i, the total (direct and indirect) demand for intermediate input j per unit of export (or import substitute) i is,

$$d^*_{ij} = d_{ij} \frac{P^*_j/P_j}{P^*_i/P_i}. \qquad (4)$$

As for the shadow prices of factor inputs, these should be equal to the marginal productivities of the factor inputs in a situation of free trade. But it is impractical to make such an estimation. For simplicity, this study estimates the marginal productivities of factor inputs under the existing trade regime and uses them to approximate their shadow prices (W^*_k).

The shadow prices of factor inputs are estimated only for labor and capital.[13] Labor is further classified into three categories so as to take account of differences in productivities: agricultural labor, industrial unskilled labor and industrial skilled labor. In the case of agricultural labor we estimate its marginal productivity in terms of the annual total wage received during the peak days (on which labor is fully employed) of rice production. Our estimated daily wage on peak days and number of peak days are NT\$61.2 and 40.84 days for 1961 and NT\$84.0 and 48.90 days for 1971. The shadow wage rate of agricultural labor is thus

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[11] For further discussions on shadow pricing, see T. J. Bertrand, "Shadow Pricing in Distorted Economies," *American Economic Review*, Vol. 69, No. 5 (December 1979).

[12] See E. Bacha and L. Taylor, "Foreign Exchange Shadow Price: A Critical Review of Current Theories," *Quarterly Journal of Economics*, Vol. 85, No. 2 (May 1971).

[13] The capital input defined here is a composite of land, fixed equipment, buildings, cash, and inventory.

NT$2,499.4 for 1961 and NT$4,107.6 for 1971. As for industrial unskilled labor, it is considered to have the same opportunity cost as does agricultural labor, since an increase in the employment of one unit of unskilled labor in the industrial sector requires the withdrawal of one unit of agricultural labor.[14] This, however, is not true for the case of industrial skilled labor, which has gone through some sort of training within the industrial sector. We assume the market wage to reflect its marginal productivity.[15] Finally, the shadow interest rate is estimated from Solow's aggregate measure of the social rate of return on investment, which is equal to the change in national income arising from a marginal increase in aggregate saving, plus the annual rate of depreciation.[16] The annual social rates of return on investment so estimated are 35 per cent for 1961 and 32 per cent for 1971 and we arbitrarily assume a 5 per cent rate of annual depreciation. The differentials between our estimated shadow interest rates and the market rates, which are 28.8 per cent and 25.2 per cent for 1961 and 1971 respectively, may be explained by the tendency for most developing countries to undervalue their capital.

As far as factor input coefficients are concerned, it is rather difficult to predict how free trade might affect their magnitudes. We make the following assumptions for them: first, capital coefficients are unaffected by changes in trade policies and thus they can be estimated from the existing data; and second, labor coefficients differ only because the unit measurement of commodities has been changed from market prices to shadow prices. Mathematically, the factor coefficient using shadow prices is $b^*_{jk} = b_{jk}$ when k represents capital input, or $b^*_{jk} = b_{jk} P_j / P^*_j$ when k represents labor input.

Given the estimates of d^*_{ij}, b^*_{jk}, and W^*_k, the formula for a domestic resource cost estimate may be modified to reflect the estimated social cost of production,

$$DRC^*_i = \sum_j d^*_{ij} \sum_k b^*_{jk} W^*_k . \tag{5}$$

Industry i is efficient, breaks even, or is inefficient, if DRC^*_i is less than, equal to, or greater than one.[17]

IV. CHANGES IN THE STATIC ALLOCATIVE EFFICIENCY IN THE FOREIGN TRADE SECTOR OF TAIWAN

The DRC estimates of trade industries for 1961 and 1971 are shown in Table II

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[14] In Taiwan, the withdrawal of labor from the agricultural sector occurred during the period of industrial expansion because the growth of the industrial labor force was far more rapid than the natural growth of population within the industrial sector. The average market wage rates for the labor of this category, NT$6,034 for 1961 and NT$16,252 for 1971, do not reflect this marginal concept.

[15] The market wage for industrial skilled labor is estimated from the census data mentioned in Section II.

[16] See R. M. Solow, *Capital Theory and the Rate of Return* (Amsterdam: North-Holland Publishing Co., 1963), pp. 16–47.

[17] Owing to the various assumptions made above, the DRC estimates obtained in this fashion may be only rough estimates of the actual costs. We thus will pay more attention to their relative values than to their absolute values.

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TABLE II
THE DOMESTIC RESOURCE COST ESTIMATES, 1961

Industry		DRC*
Sugar	X	0.8092
Canned foods	X	6.2443
Textiles	X	0.9976
Lumber and plywood	X	0.4304
Rubber and rubber products	M	3.3345
Chemical fertilizer	M	0.5087
Drugs	M	1.2529
Miscellaneous chemicals	M	1.6119
Petroleum products	M	1.6845
Cement and cement products	X	0.3080
Miscellaneous metal products	M	1.2665
Machinery and instruments	M	8.4583
Electric machinery and equipment	M	3.8544
Transportation equipment	M	1.6648
Miscellaneous manufactures	M	1.3956

Note: DRC* denotes domestic resource cost per NT dollar of foreign exchange earnings (or savings). X denotes export industry. M denotes import substitution industry.

and Table IV respectively. From the estimates for 1961 in Table II, we observe that most of them are greater, and in some cases much greater, than the critical value of one. In other words, most of the trade industries, in the way they are classified, were inefficient in 1961. We further find that all of the inefficient industries were import substitution industries except for the canned food industry.[18] This evidence supports the general concensus among economists that a protective trade policy tends to distort the allocation of resources in favor of inefficient import substitution industries. As for the minority of efficient industries, only one, i.e., chemical fertilizer,[19] was an import substitute and the rest, including sugar, textiles, lumber and plywood, and cement and cement products, were exportables. This suggests that most export industries, being discriminated against by the strategy of import substitution, had to be economically efficient if they were to compete with other industries for domestic resources and in the meantime to stay competitive in the world market.

The trade policy can also be evaluated by grouping the size of output produced by each category of industries according to their efficiency. Table III shows that the export sector and the import substitution sector were almost the same in size but distinctively different in the way their outputs were distributed between the efficient and inefficient groups, the former being predominantly efficient and the

[18] For an export industry like canned food the DRC could well be overestimated as its capital coefficient is exaggerated by high domestic input prices and relatively low world market price for its output.

[19] I am indebted to M. H. Hsing, who pointed out that the DRC for chemical fertilizer could have been underestimated because its machinery and equipments were imported at considerably favorable exchange rates in the 1950s.

TABLE III
COMPOSITION OF DOMESTIC PRODUCTS IN THE FOREIGN TRADE SECTOR, 1961
(%)

	Efficient Group	Inefficient Group	Total
Export sector	44.74	3.35	48.09
Import substitution sector	8.47	43.44	51.91
Total	53.21	46.79	100.00

latter predominantly inefficient. It is obvious from this observation that import substitutes, under the encouragement of the protective scheme, were able to expand rapidly during the 1950s in spite of the fact that they were subject to the growth of the domestic market and to the supply of foreign exchange. The implication of this trade policy for the allocative efficiency in the foreign trade sector of Taiwan is thus clear. On the one hand, there was a decrease in the efficiency of resource allocation due to the decline of the relative size of exports, which had been the major source of efficiency in the foreign trade sector. On the other hand, increasing proportions of domestic resources were attracted to the inefficient production of import substitutes.[20] As a result, this inefficient use of domestic resources aggravated the problem of trade deficits and slowed down the growth of the output of the economy.

Turning to the DRC estimates of trade industries for 1971 in Table IV, we notice that they are in general much lower than those of 1961, signifying an overall improvement in allocative efficiency in the foreign trade sector after the switch to the policy of export promotion. Even more significant is that thirty out of the thirty-nine industries under study have their DRCs lower than one, which explains why in 1971 there was a substantial improvement in Taiwan's trade balance when compared to the year of 1961. The export sector, which had twenty-three efficient industries and three inefficient industries, was the major source of efficiency, whereas the import substitution sector, with seven efficient industries and six inefficient industries, was the major source of inefficiency. However, unlike 1961, efficient industries predominated and the inefficiency of the import substitution sector was relatively insignificant in 1971.

The above relationship can also be seen from Table V, which groups the outputs of the export and the import substitution sectors according to their allocative efficiency. The share of the output of the efficient group in the foreign trade sector was 83 per cent, 30 per cent higher than in 1961. This improvement resulted from the expansion of the absolute and relative size of the efficient export sector as well as, to a lesser extent, from the improvement in the relative efficiency of the import substitution sector. In effect, as increasing proportions

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[20] If Krueger's finding that an import substitution industry is more capital-intensive than an export industry is true for the case of Taiwan, the import substitution sector must have employed a much bigger chunk of the economy's capital stock than did the export sector. See A. O. Krueger, "Alternative Trade Strategies and Employment in LDCs," *American Economic Review*, Vol. 68, No. 2 (May 1978).

TABLE IV

THE DOMESTIC RESOURCE COST ESTIMATES, 1971

Industry		DRC*
Sugar	X	0.4717
Canned foods	X	0.7907
Slaughtered meat	X	0.5208
Monosodium glutamate	M	0.6880
Non-alcoholic beverage	X	0.3177
Tea	X	0.9333
Miscellaneous food products	X	0.6783
Artificial fiber	M	0.5524
Artificial fabrics	X	0.7288
Cotton fabrics	X	0.7466
Woolen and worsted fabrics	X	0.4714
Miscellaneous fabrics and apparel	X	0.8738
Lumber	X	0.5785
Plywood	X	0.5252
Products of wood, bamboo, and rattan	X	0.7079
Pulp, paper, and paper products	M	1.1910
Leather and leather products	X	0.7552
Rubber and rubber products	X	1.4023
Medicine	M	1.2281
Plastics and products	X	0.6979
Petroleum products	M	0.1846
Non-edible vegetable and animal oil	X	0.6360
Industrial chemicals	M	0.7816
Miscellaneous chemical manufactures	M	0.7016
Cement	X	0.4085
Glass	X	0.5475
Iron and steel	M	1.4677
Iron and steel products	X	0.7077
Aluminum	M	1.2491
Aluminum products	X	1.0174
Miscellaneous metals and products	M	19.6622[a]
Machinery	X	1.1889
Household electric appliances	X	0.8346
Communication equipment	X	0.6345
Other electric apparatus	M	1.9136
Shipbuilding	M	0.9493
Motor vehicles	M	0.9026
Other transport equipment	X	0.8324
Miscellaneous manufactures	X	0.7001

Note: DRC* denotes domestic resource cost per NT dollar of
foreign exchange earnings (or savings). X denotes export industry.
M denotes import substitution industry.
[a] The unusually high estimate for this industry is due to its un-
usually high labor coefficients estimated from the census data.

of domestic resources were used efficiently in the foreign trade sector, Taiwan
was able to improve its trade balance and enjoy rapid output growth in the period
from 1961 to 1971.

During the process of export expansion from 1961 to 1971, there were some

TABLE V

COMPOSITION OF DOMESTIC PRODUCTS IN THE FOREIGN TRADE SECTOR, 1971

(%)

	Efficient Group	Inefficient Group	Total
Export sector	66.52	5.46	71.98
Import substitution sector	16.64	11.38	28.02
Total	83.16	16.84	100.00

changes in the structure of trade industries induced by the switch of trade policy. First, there was an expansion of those export industries which were already efficient in 1961. For examples, textile exports increased fourteen times, lumber and plywood ten times, and cement and cement products three times between the two years. One exception is sugar whose relative importance had been steadily declining throughout the second period.[21] In 1971 the share of sugar exports in the economy's overall exports was less than 5 per cent, which was a drastic decline from above 50 per cent in the 1950s. This occurred as part of a process in which land-based agricultural exports gave way to labor-intensive manufactured exports, in which the economy had greater comparative advantage. Second, some import substitution industries, including industrial chemicals, miscellaneous chemicals, artificial fiber, and petroleum products, had expanded to produce for the intermediate demand of exporting industries. They had become more efficient because they had to compete with comparable tariff-free imports. Third, some other import substitution industries had been converted into export industries as they had become increasingly competitive. Machinery and glass were good examples. Fourth, there must have been some inefficient import substitution industries which were forced to close down as they were unable to compete with other industries in the use of resources.[22] Other inefficient import substitution industries had survived mainly because of the existing protective system which encouraged production for domestic final demand and for the intermediate demand generated by domestic consumption. Industries of this nature included iron and steel, medicine, pulp, paper and paper products, and other electrical appliances. Finally, various new and efficient export industries had emerged and become relatively important since the late 1960s. Most important of all were the electronics, and plastics and plastic products industries, which exported respectively about 13 and 6 per cent of the economy's total exports in 1971. Undoubtedly, these changes in the structure of trade industries were favorable to the improvement in the allocative efficiency in the foreign trade sector of Taiwan. Without the switch of the trade policy, these changes would not have taken place and the foreign trade sector would have remained inefficient.

[21] The growth rate of sugar exports in NT dollar from 1961 to 1971 was only 13 per cent, whereas exports other than sugar and rice expanded by 1,437 per cent in the same period.
[22] A change like this, however, cannot be seen from our highly aggregated data.

V. SUMMARY AND CONCLUSIONS

The economy of Taiwan experienced astonishing structural changes following the switch of its trade policy from import substitution towards the promotion of exports in the early 1960s. Labor-intensive manufactures took the place of traditional sugar and other agricultural items in export and grew vigorously throughout the past two decades. Export expansion, in the meantime, replaced import substitution as the basis of the economy's industrialization process. As a result the trade gap was narrowed and the downward trend of output growth was reversed.

To analyze the role played by such a switch of trade policy, this study employs the DRC measure to evaluate the efficiency of individual trade industries in 1961 and 1971 and then examines the differences that exist between the two sets of the estimates. We observe that, on the average, trade industries in 1971 were significantly more efficient, in terms of either the absolute values of the DRC estimates or the proportion of industries which were efficient, than in 1961. Such an improvement was the result of the following structural changes between the import substitution sector and the export sector. On the one hand, the output share of the predominantly inefficient import substitution sector dropped tremendously between the two years. On the other hand, the corresponding rise in the output share of the export sector was dominated by the rise of efficient manufacturing industries. This expansion of the relative and absolute size of the efficient export sector provided the economy with a basis for rapid growth of the supplies of capital and foreign exchange and thus accelerated the output growth of the economy.

In our foregoing analysis, we notice that the key role played by the strategy of export promotion in Taiwan was that it removed the detrimentally biased effects of the existing protective scheme on exports. Most of the "promotion" measures were aimed at providing exporters with an effective exchange rate similar to what was given to the importers. They were promotive only in the sense that when the distortive effects of the trade policy on resource allocation were reduced, the inefficient import substitution sector, on receiving lower private rates of return, was forced to release resources to the efficient export sector. The growth of the export sector was thus based more on its competitiveness in the world market than on the favorable treatment, if any, received from the government's trade policy.

The experience of Taiwan has demonstrated to other LDCs how the problem of trade deficits may be dealt with by employing an outward-oriented trade policy. Making such a switch does not call for an unpopular total removal of import barriers to be replaced by export incentives. To promote exports, an economy will need only to remove some import barriers which directly obstruct the expansion of exports, such as tariffs on imported inputs for the export sector, and to provide exports with incentives only to the extent that they are no longer discriminated against by the protective scheme. In so doing, distortions between

the export and import substitution sectors will be reduced and trade industries can expand on the basis of efficiency. When trade industries are efficient, the trade balance can be improved and output can grow more rapidly.

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