

THE DECLINING COMPETITIVENESS OF THE TAIWANESE PRODUCTS IN THE GERMAN MARKET⁺

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1. INTRODUCTION: A LONGITUDINAL VIEW

In the last two decades the trade volumes among the non-communist countries have increased nearly eight times, from \$ 216 bn. in 1960 to \$ 1923 bn. in 1977. The nominal annual growth rate is about 14 %. But for the EEC as a whole, its trade volumes have grown only 5.7 times (for 1960-1979, the figure is 8.8 times largely due to the expansion of the EEC in its membership). The trade performance of the EEC is therefore below the world average. Only West Germany, whose economy is very open, has registered an impressive trade growth; its growth rate for this period is 13.5 times.

In 1960 Taiwan's economy was still underdeveloped and therefore its base of trade figures was very low. Accordingly its trade volumes have shown a fantastic growth of 66 times during this period. In terms of annual growth rate, the figure for EEC, West Germany and Taiwan are 12.4 %, 14.6 % and 25.1 %, respectively. Generally speaking, the trade expansion was faster in the 70' s than in the 60' s, reflecting the liberalization in the world trade and the rapid economic development in some developing countries as well as outward redirection of many such economies away from import substitution during that period, such as S. Korea, Taiwan, Hong Kong, Singapore in Asia and Mexico and Brazil in Central and South America. The emergence of this group, the so-called NICs (Newly Industrialized Countries), on the world economic map has greatly contributed to the growth in the world trade¹.

The growth momentum was set back after the oil price increase in 1973. For instance, the trade volume of Taiwan decreased by as much as 10.7 % from 1974 to 1975. However, the economies of the NICs have weathered the "oil storms" relatively well and since 1976 they started to grow rapidly again. In 1976 Taiwan's trade registered a remarkable 40 % rise.

Table 1: The Bilateral Trade Relations Between West Germany and Taiwan
(1000 \$)

Period	1		2	
	German Imports From Taiwan		German Exports To Taiwan	
1960	4 678.00	(0.0 %)	10 339.00	(0.0 %)
1961	3 044.00	(-34.93 %)	12 010.00	(16.15 %)
1962	9 194.00	(202.04 %)	14 003.00	(16.59 %)
1963	13 987.00	(52.13 %)	10 302.00	(-26.43 %)
1964	18 788.00	(34.32 %)	10 342.00	(0.39 %)
1965	29 788.00	(58.55 %)	15 804.00	(52.81 %)
1966	35 947.00	(20.68 %)	29 345.00	(85.68 %)
1967	46 154.00	(28.39 %)	26 184.00	(-10.77 %)
1968	51 818.00	(12.27 %)	39 567.00	(51.11 %)
1969	58 138.00	(12.20 %)	44 224.00	(11.77 %)
1970	77 126.00	(32.66 %)	61 150.00	(38.27 %)
1971	99 682.00	(29.25 %)	81 604.00	(33.45 %)
1972	127 743.00	(28.15 %)	84 822.00	(3.94 %)
1973	228 706.00	(79.04 %)	224 824.00	(165.05 %)
1974	294 701.00	(28.86 %)	303 554.00	(35.02 %)
1975	371 067.00	(25.91 %)	268 034.00	(-11.70 %)
1976	432 295.00	(16.50 %)	266 187.00	(- 0.69 %)
1977	529 071.00	(22.39 %)	227 560.00	(-14.51 %)
1978	656 866.00	(24.15 %)	337 094.00	(48.13 %)
1979	876 796.00	(33.48 %)	502 975.00	(49.21 %)
1980	1 075 864.00	(22.7 %)	722 267.00	(43.6 %)
1981	906 258.00	(-15.7 %)	646 428.00	(-10.5 %)

(Figures in brackets represent growth rates)

Source: Außenhandel Deutschland, Reihe 5, Wiesbaden for 1960-79 and Taiwan Statistical Data Book, 1982, Council for Economic Planning and Development, Executive Yuan, Republic of China, for 1980 and 1981, (p.191). The figures from the two sources are not always identical.

Table 1 displays the bilateral trade between Germany and Taiwan for the period 1960-1979. Germany's imports from Taiwan have an average of 37 % growth rate a year, and at the same time its exports to Taiwan also experienced a respectable 28.6 % annual growth. Among the EEC, Germany has been the sole economy which has a chronic deficit in its trade with Taiwan (1960-1962, and 1974 are some exceptions).

The commodity composition of Germany's imports from Taiwan is characterized by consumer goods, but the structure of its imported items within the category has undergone a drastic change over the time. In the 60's, 73 % of its imports were composed of food and other agricultural products. But in 1979, 85 % of its imports went to manufactured goods. On the other hand, Germany's exports to Taiwan consist mostly of industrial products, c.a. 90 %.

In summary, although Germany is an important economic power in the world and Taiwan is just an emerging small industrialized country, its rapid and steady economic development has made Taiwan more visible on the world economic map. Germany is the third most important export market for Taiwan, after the USA and Japan. In 1979, Germany's share in Taiwan's export was 4.6 % and its share in Taiwan's import was 4.3 %. On the other hand, its exports to Taiwan have increased phenomenally in absolute term (see Table 1).

From 1960 to 1979, Taiwan's share in Germany's visible exports has increased from 0.086 % to 0.29 %. Admittedly, the relative significance of Taiwan as an outlet for German products is still negligible, but the historical data have clearly revealed the trends that the bilateral trade volumes between the two countries have been moving upward sharply. It is for this reason that an in-depth study on this problem is warranted.

In the following section, attempt will be made to decompose the factors which have contributed to the growth of German imports from Taiwan during the period under study². Among others, the factors consist of growth effect, commodity composition effect and competitiveness effects. In the concluding section, the major findings will be summarised and the reasons for the declining competitiveness of the Taiwanese products in the German market enunciated.

2. FACTOR DECOMPOSITION OF GROWTH IN GERMAN IMPORTS: A CONSTANT MARKET SHARE ANALYSIS

In the preceding section we have seen that German imports from Taiwan have registered a tremendous increase of 130 times since 1960. It is then natural to ask the question: What are the factors which have made this growth possible? To answer this question, use has been made of the so-called constant market share (CMS) model. The CMS model is a useful tool for analysing the past trade performance of a country. It was first devised by H. Tyszynski in 1951

and ever since widely used by economists in dealing with the trade problems³. Essentially the model decomposes a country's trade (imports or exports) growth into four factors: (1) the overall growth effect, (2) the commodity composition effect, (3) the market composition effect⁴ and (4) the competitiveness effect⁵.

The Model

Applying the model to the analysis of German imports from Taiwan, we may write the model in the following identity:

$$\sum_{i=1}^n (M_{i t_1} - M_{i t_0}) = r \sum_{i=1}^n M_{i t_0} + \sum_{i=1}^n (r_i - r) M_{i t_0} + \sum_{i=1}^n (M_{i t_1} - M_{i t_0} - r_i M_{i t_0}),$$

where M_i : German import of the i th commodity from Taiwan, $i=1, \dots, n$;
in this case i 's are the SITC groups;

t_0 : the base year;

t_1 : the current year;

r : growth rate of Germany's overall imports during the period

$t_0 \longrightarrow t_1$;

r_i : Growth rate of Germany's total import of the i th commodity;
 r and r_i 's are measured in decimal point.

The term on the left hand side of the identity measures the actual change of the total German imports from Taiwan during a specified period. The first term on the right hand side measures the "growth effect" of German (total) imports. It denotes the magnitude of the change of the German imports from Taiwan (MGT), under the assumption that it had just grown at the same rate as Germany's overall imports.

The coefficients of the second term are the deviations of the growth rates of the individual commodities from the overall growth rate. If Taiwan has exported most commodities into Germany, which grow faster than the overall rate, then this term will be positive, otherwise negative. A positive in this term will indicate that Taiwan is producing the right commodities most needed by Germany. This term is therefore referred to as "commodity composition effect".

The last term represents the contributions to import growth other than the above mentioned two factors; it measures the "competitiveness effect"⁶ It is

positive, if Taiwan enjoys a better competitive power than its competitors in penetrating the German market, and vice versa⁷.

3. MAJOR FINDINGS AND REASONS FOR DECLINING COMPETITIVENESS OF TAIWANESE PRODUCTS

In order to get an idea about the structural changes in the relative significance of the three effects over the time, we have subdivided the period 1960-1979 under study into four sub-periods: 1960-1965, 1965-1970, 1970-1975, and 1975-1979. Each sub-period covers five years except for the last one, which has only four years. The results are presented in Table 2.

Table 2: Effects on German Imports

Time Interval	60-79	60-65	65-70	70-75	75-79
Growth Rate of MDT ¹	(12989.)	(534.)	(158.)	(268.)	(118)
Increment of MDT (Y)	613839. ³ (100)	25235.0 (100)	47308.9 (100)	206809.0 (100)	334486. (100)
Increment due to growth effect (percentage of Y)	48810.9 (7.95)	3380.54 (13.40)	20984.9 (44.36)	78685.6 (38.05)	262511.0 (78.48)
Increment due to commodity composition effect (percentage of Y)	-12642 (-2.06)	-459 (-1.82)	-7596 (-16.06)	-12181 (-5.89)	-9834 (-2.94)
Increment due to competitiveness effect (percentage of Y)	577670 (94.11)	22314 (88.42)	33920 (71.70)	140304 (67.84)	81808 (24.46)

¹MDT = German import from Taiwan

²Figures in parentheses are in percentage

³Unit: 1000 ECU (European Currency Unit)

The salient points are summarised as follows:

1) If we look at the whole period under study 1960-1979, the German imports from Taiwan have increased some 130 times. Of the increase, ca. 8 % was

due to the growth effect of German overall imports. Considering the fact that Germany's imports are highly dependent on its general economic performance, we may term this effect as Germany's growth effect. The growth effect is thus considerably lower than its norm value of 100 %. The commodity composition effect has been found to be a negative 2.06 %, implying that most of the products exported from Taiwan to Germany belonged to those categories of slow-growing items.

Intuitively, this result is hardly surprising when one remembers that the majority of the Taiwanese products were composed of agricultural products, especially in the early 60's, which were subject to "Engel's law", and characterised by low income and price elasticities. As a result, when German per capita income grew, comparatively less agricultural products were consumed. As a major supplier of certain agricultural products, Taiwan's exports were adversely affected. The bulk of Taiwan's export increase over the last two decades was attributable to its competitive effect. This has registered a dominating share of 94 %, which is greatly larger than its norm value of zero. However, this effect has declined steadily over the time. To this point our discussion will be returned below.

2) The results obtained from the computation over a long time span of 20 years inevitably veiled a lot of valuable information regarding structural transformation of the Taiwanese economy. This information was revealed by comparative static studies performed in the four sub-periods.

Firstly, the growth effect has shown a clear-cut increasing trend; it rose from 13.4 % in 1960-65 to 78.48 % in 1975-79. This result implies that Taiwan's exports were highly vulnerable to economic fluctuations in Germany. A prosperous German economy will import more from foreign countries and Taiwan's economy will greatly benefit from it, and vice versa. Fortunately, the German economy has been doing very well after the war and for this reason Taiwan's cheap labour-intensive exporting industries have been thriving on it.

Secondly, the commodity composition effect did not show a definite trend, although between 1965-1975 it was highly unfavorable. The persistent negative commodity composition effect has demonstrated the disadvantages of a developing country in its trade relations with an advanced industrialized country. The developing countries, like Taiwan, export predominately two categories of goods, namely agricultural products and cheap consumer goods, both of which are characterized by low income and price elasticities as well as keen competition, and subject to high non-tariff barriers.

Table 3 below shows the reason why Taiwan's exports to Germany have suffered from a negative composition effect. 69 % of its imports come from SITC O, which has registered the lowest growth rate (4.66 % only from 1960-1979) among the German import items⁸.

Table 3: Structure of German Imports

Commodity Group	Growth rate of total German Imports (1960 to 1979)	Distribution of German imports from Taiwan in 1960 (percentage)
Total	10.33	100
SITC 0	4.66	69
SITC 1	6.06	0
SITC 2	3.05	9
SITC 5	18.83	13
SITC 6	22.08	2
SITC 7	19.56	0
SITC 8	21.77	0
SITC Z (rest)	10.33	7

Thirdly, the competitive effect has been decreasing monotonously. The decline in the first 15 years from 1960-1975 was relatively slow, albeit steady; the sharpest drop occurred from 1975 onwards. It fell from 67.8 % for 1970-75 to 24.46 % in 1975-79. This is because there are a number of unfavorable factors in operation. But the fundamental one has been the wage and labour factor. Before 1975, there were still surplus labour in the agricultural sector. Most of them were in effect disguised unemployment, whose opportunity costs were zero. In this "Lewis World"⁹, the supply of industrial workers is infinitely elastic and the wage rate remained low and stable. In the last five years, however, this "Lewis world" vanished altogether from the Taiwanese economy. There was a shortage of labour in the agricultural sector due to the internal population migration, especially the exodus of workers from the countryside¹⁰. The supply of labour turned inelastic both in the agricultural and in the industrial sector. The real wage was consistently pushed upwards, which had transmitted into the export prices¹¹. The other factor for the price increase in the Taiwanese exports has been the fact that Taiwan has to import oil and a great spectrum of raw materials as well as intermediate inputs. Their prices have gone up sharply too since 1974. As a result, the price competitiveness for Taiwanese products on international market has been severely blunted.

Notes

- +) This paper was based on a study conducted under the auspices of the Sonderforschungsbereich der Deutschen Forschungsgemeinschaft for "Economic Forecasting, Decision and Equilibrium Models" between January and June 1981 at the University of Bonn. The authors are indebted to Prof. W. Krelle of Bonn University and Anthony M. Tang of Vanderbilt University for reading the original manuscript and making useful suggestions. As usual, the responsibility for any remaining deficiencies rests entirely with the authors.
- Due to space limitation detailed appendices have been omitted. These statistical data are available from the authors on request (addresses cf. p. 132).
- 1) For detailed figures see Eurost., Monatsbulletin der Außenhandelsstatistik, Sonderheft, 1958-1979, (1980, Luxemburg), p. 25.
 - 2) The decomposition analysis was made on the German imports from Taiwan only. The same can, of course, be done on Taiwan's imports from Germany.
 - 3) See H. Tyszynski (1951), and J. B. Donges (1972), R. Banerji (1974), A. Maizets (1963), and T. B. Lin, V. Mok and Y. P. Ho (1980), H. B. Chenery and D. B. Keesing (1979).
 - 4) To be neglected in the present study.
 - 5) The exact meanings of these effects will be made clear below. Here we would like to quickly point out the limitations inherent in this model. First, the model is an identity and as such it conveys no sense of causal relationship. The results obtained stop short of providing any explanations as to why trade volumes (exports or imports) have grown as the way they actually did. For example, a negative composition effect means only that the commodity structure was more than proportionately concentrated in those commodities of low growth; to gain insight into the unfavorable commodity composition, additional information on industrial structure and its diversification is needed. Second, the CMS model is non-stochastic and therefore is not capable of making predictions. Finally, it is valid only on the basis of the time period and the level of commodity aggregation chosen. A different degree of commodity aggregation may result in different direction, which may have completely different policy implications. Despite these demerits the model is useful in quantitatively decomposing a mass of trade data into different components which were responsible for the past trade performance of a country. It is a powerful analytical tool whereby a policy maker can be directed to areas where more attention should be paid to rectify or improve his country's trade performance in the future.

- 6) This term indicates whether a country has been able to compete with its competitors in each individual commodity market in Germany. However, as this term is just a remainder, it poses difficulty of interpretation. One possible interpretation is the price elasticity of substitution in international trade. But competitive power is also influenced by non-price factors, such as quality and variety of products, marketing techniques, terms of export financing, speed of delivery and so on.
- 7) It should be noted that the norm value (in percentage) for the growth effect is 100 %, while that for the commodity composition effect and competitiveness effect is zero. The concept of the norm value is introduced by T. B. Lin (1982).
- 8) The following goods suffer most:
 - (1) Mushroom, being one of the fastest growing import commodities and accounting for 23 % of the total German imports from Taiwan in 1971, is restricted from year to year by import licences, and in 1979 it is totally prohibited from importing. (See *Amtsblatt der Europäischen Gemeinschaften*, Verordnung No. 1102/78, May 1978).
 - (2) After the GATT agreement, EEC itself imposed in 1975 import quotas on textile products coming from specified countries, and Taiwan was one of them. (See *Amtsblatt der EG*, Verordnung No. 1783/75, July 1975; No. 3020/77, Dec. 1977; No. 255/78, Feb. 1978; No. 2604/78, Nov. 1978; and No. 2277/79, Oct. 1979).
- 9) W. Arthur Lewis, (1955).
- 10) M.H.Hsing, (1976).
- 11) For a comprehensive analysis of economic development in Taiwan and its structural change over the time, see W. Galenson (1979), and J. Fei, G. Ranis and Shirley W. Y. Kuo (1980).

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