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## Effective protection of West German industry

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Working Paper No. 6

Effective Protection of West German Industry.

by

U. Hiemenz and K. v. Rabenau

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## Effective Protection of West German Industry

by

Ulrich Hiemenz and Kurt v. Rabenau<sup>+</sup>

### I. THE CONCEPT OF EFFECTIVE PROTECTION

1. The establishment of the Common Market, a more inward-looking trade policy on the part of the United States and, last but not least, the urgent demand of less developed countries for free access to the markets of the highly industrialized nations have revived international interest in the impact of foreign trade regulations on a country's domestic industry. One of the major points of interest is to analyse how trade regulations influence the comparative costs of domestic industries and consequently the structural pattern of industry. Protective measures such as tariffs, import quotas, subsidies and taxes alter a given industrial pattern by providing some industries with an advantage, while the economic conditions of others remain unchanged or even worsen. In the course of international trade liberalisation, reductions of trade barriers will create a need for adjustment processes in almost all economic activities. Effective rates of protection may help to achieve a better and smooth adjustment by providing information on the impact of trade regulations on gross production.

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2. In a world with intermediate and final goods the impact of a tariff system on production activities is twofold: on the one hand a tariff imposed on competing imports makes possible a similar increase<sup>1)</sup> in the price of the respective domestic commodity; but on the other hand the prices of the inputs necessary to produce that commodity may have risen as a result of tariffs also. Thus a tariff on a final product can be compared to a subsidy on the domestic activity, whereas tariffs on raw materials and intermediate products are similar to indirect taxes. These two controversial effects must be balanced in order to estimate the real degree of protection which an industry obtains from tariffs. The concept of effective protection provides a methodology for such calculations which is based on domestic value added. Effective rates of protection show to what extent the different industries can increase, or have to reduce, their production costs under the tariff system, as compared to a free trade situation.
3. Because effective rates of protection measure the changes of industrial value added which have been induced by the national trade policy<sup>2)</sup> only these rates provide information on the structural impact of trade regulations. The higher the effective rate of protection for one activity in relation to other industries, the greater the chance for the more heavily protected sector to accumulate more capital and/or

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1) Given an infinitely elastic supply curve for imports.

2) The effects of trade regulations other than tariffs will be discussed in Section VI.

labour, as compared to a free trade situation, and to increase output. Therefore the structural pattern of industry is distorted in favour of the more highly protected sectors and the factors of production are not allocated according to the laws of productivity. If policy makers know the amounts and structure of the effective rates of protection, they are able to induce a factor-migration between different occupations by means of trade policy. The reduction of an industry's effective protection, for example, results in a decrease of its value added. Firms at the margin (that is, firms with a relatively high level of production costs) will have to close down because they are no longer able to cover their variable costs or because profits fall below the minimum rate of long-term profitability. Thus capital and labour would move to other occupations. The precise volume of migration, however, cannot be estimated because it depends heavily on the structure of production costs of firms in the branch under consideration.

## II. METHODS

4. Having shed some light on the conceptual background of our analysis, we now turn to the measurement of effective protection. For conceptual and methodological reasons calculations have been carried out in two distinct steps. First, effective rates of protection were estimated merely on the basis of ad valorem and specific tariffs (the so-called effective tariff rate). The protection effects of all trade regula-

tions taken together - as far as data availability allowed us to include them - result from a second calculation. This procedure has the advantage of showing separately to what extent the currently most important trade regulation, that is, tariffs, influences the structural picture of West German industries and to what extent the structure of tariff protection is altered by additional trade regulations. In addition, separate calculations were preferred because of the differing availability of data. While there is a complete schedule of tariffs, the difficulties in collecting information on nontariff distortions are tremendous and sometimes insurmountable.

5. To calculate effective tariff rates for the different branches of West German industry, a somewhat complicated-looking formula has been developed from the general theory of effective protection.<sup>3)</sup> Basically effective rates of protection are derived from a neo-classical model of an open economy with linear homogeneous production functions<sup>4)</sup> and internationally traded goods. The initial formulation of the basic concept goes back to the pioneering theoretical contributions of Max Corden.<sup>5)</sup> According to this concept the effective protection of a

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3) A simple introduction to the theory of effective protection is given in H.G. Grubel, "Effective Tariff Protection, A Non-specialist Guide to the Theory, Policy Implications and Controversies", in H.G. Grubel and H.G. Johnson (eds.), Effective Tariff Protection (Geneva, 1971), pp. 1-15. A more rigorous treatment of the subject may be obtained from W.M. Corden, The Theory of Protection (Oxford, 1971).

4) Because of this assumption calculations on the basis of value added per unit of output are equivalent to calculations based on total value added.

5) W.M. Corden, "The Tariff", in A. Hunter (ed.), The Economics of Australian Industry, Studies in Environment and Structure (Melbourne, 1963), pp. 174 sqq. - W.M. Corden, "The Structure of a Tariff System and the Effective Protective Rate", The Journal of Political Economy, 1966 (Vol. 74), pp. 221 sqq.

production activity  $j$  is defined as the per cent increase of domestic value added  $V_j$  (domestic production costs) above value added measured in world market prices  $V_j'$  (that is, cif-import prices). Using input-output terminology, this rate,  $E_j$ , may be written as:

$$E_j = \frac{V_j}{V_j'} - 1 = \frac{1 - \sum_i \alpha_{ij}}{\frac{1}{1+t_j} - \sum_i \frac{\alpha_{ij}}{1+t_i}} - 1 \quad \begin{array}{l} j = 1, \dots, n \\ i = 1, \dots, m \end{array}$$

where the  $\alpha_{ij}$  represent the value input coefficients of the inputs  $i$  in the production of the product  $j$ , while  $t_j$  and  $t_i$  indicate the nominal tariffs on  $j$  and  $i$  respectively.

6. The empirical applicability and prediction power of the above formula depend on a number of assumptions whose relevance has been heavily discussed in the economic literature. By extending the concept with respect to nontariff distortions, non-traded inputs, depreciations and a distinction between domestically sold and exported goods, it was possible to narrow the gap between theory and reality. Yet, as Wilfred Ethier's<sup>6)</sup> excellent contribution proves, two basic assumptions are necessary if effective rates are to show the distortions of gross production caused by protection. First, physical input coefficients of intermediate goods must not be influenced by the protective system or its changes; and second, the protective measures must be neither prohibitive nor redundant.

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<sup>6)</sup> W.J. Ethier, "General Equilibrium Theory and the Concept of the Effective Rate of Protection", in Effective Tariff Protection, op. cit., pp. 17 sqq.



7. The assumption of constant input coefficients means that the impact of protective measures on input prices must lead neither to substitution processes between intermediate and primary inputs (labour and capital) nor to substitution between the intermediate inputs. The first outcome is very unlikely to occur, because in general physical parts of a product cannot be replaced by additional labour or capital inputs or vice versa. Whether or not a substitution between the intermediate inputs takes place depends on the technical composition of the product. Given a possibility for alternative compositions, tariff changes will have to induce remarkable distortions in price relations to produce substitution processes. Entrepreneurs will prefer one input against another only if current input costs can be reduced substantially so that the extraordinary costs associated with the change of the production process become relatively insignificant. Since the average tariff level of West Germany on raw materials and intermediate products is comparatively low, it is reasonable to assume that tariffs have not produced significant substitution incentives. This argument is supported by empirical evidence<sup>7)</sup> showing an at least medium term independence of physical input coefficients from price changes.
8. The second assumption means that domestic prices differ from cif-import prices only by the tariff. In general this is an empirical

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7) See B. Cameron, "The Production Function in Leontief Models", The Review of Economic Studies, 1952/53 (Vol. 20), pp. 62 sqq. - K.J. Arrow and M. Hoffenburt, A Time Series Analysis of Interindustry Demand (Amsterdam, 1959). - M. Hatanaka, The Workability of Input-Output Analysis (Ludwigshafen, 1960). - C.B. Tilanus, Input-Output Experiments. The Netherlands 1948-1961, Rotterdam Dissertation, 1965, pp. 42 sqq.

rather than a theoretical question. Besides the possibility of prohibitive or redundant tariffs, price differences are a matter of differences in quality, of the degree of competition and of transportation costs. The latter are negligible, at least in the case of West Germany, since transportation costs of the domestic producers and of the importers will hardly deviate from one another on an average. Concerning prohibitive or redundant tariffs, we tried a regression analysis to identify the branches for which nominal tariff rates might not be an appropriate deflator to estimate free trade values. Unfortunately we failed in this attempt because data availability and level of aggregation were insufficient to give evidence for single branches. But since import shares in West German consumption are generally rather significant (Table 6), prohibitive or redundant tariffs will not distort our results. Nevertheless we feel that in West Germany international competition rules out significant quality differences and thereby significant price differences. Furthermore the relevance of this problem is diminished since our calculations are based on product groups instead of single, not completely homogeneous goods.<sup>8)</sup> To find out how much prohibitive or redundant tariffs might change the structure of effective rates of protection a further detailed analysis - branch by branch - would be needed.

9. To compute effective tariff rates we extended the above formula with respect to further influences on the degree of protection. First we decided to regard depreciation as capital input which diminishes value

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<sup>8)</sup> Some studies prove that this assumption is not far-fetched, empirically. For West Germany, see for instance, G. Fels, Der internationale Preiszusammenhang - Eine Studie über den Inflationsimport in der BRD (Köln, Berlin, Bonn, Mannheim, 1969).

added. This procedure allowed us to include the discrimination against some industries resulting from tariffs on investment goods. Since the components which add up to total depreciations of an industry are not known, we used the following approximation. The total depreciation coefficient  $A_j$  (depreciation divided by gross production) of an industry  $j$  was decomposed according to the current gross investment composition. The value component ( $\gamma_{xj}$ ) of an investment good  $x$  in gross investment is assumed to equal its component in total depreciations. Thus we get:

$$E_j = \frac{1 - \sum_i \alpha_{ij} - A_j}{\frac{1}{1+t_j} - \sum_i \frac{\alpha_{ij}}{1+t_i} - \sum_x \frac{A_j \gamma_{xj}}{1+t_x}} - 1 \quad \begin{array}{l} j = 1, \dots, n \\ i = 1, \dots, m \\ x = 1, \dots, m \end{array}$$

10. A problem arising from the necessary aggregation of input-output tables consists of the aggregation of domestic and export sales of the different branches. Since tariffs protect only domestic sales, export sales have to be separated for a correct calculation of effective tariffs.<sup>9)</sup> Therefore only domestic sales were deflated with the aggregate nominal tariff, while the export turnover was left unchanged:

$$E_j = \frac{1 - \sum_i \alpha_{ij} - A_j}{\frac{d_j}{1+t_j} + (1-d_j) - \sum_x \frac{A_j \gamma_{xj}}{1+t_x} - \sum_i \frac{\alpha_{ij}}{1+t_i}} - 1,$$

where  $d_j$  is the share of domestic sales in total turnover.

<sup>9)</sup> See J.C. Leith, "Substitution and Supply Elasticities in Calculating the Effective Protective Rate", Quarterly Journal of Economics, 1968 (Vol. 82), pp. 588 sqq.

11. The basic concept rests on the assumption that all goods are internationally traded. But there are quite a number of goods for which an international equalisation of prices certainly does not work (as services for example). Therefore the price of these products is not influenced by a tariff system directly but indirectly by nominal tariffs on traded inputs which are used to produce non-traded inputs. The treatment of the non-traded input largely depends on the theoretical understanding of the problem. Despite Corden's arguments<sup>10)</sup> we chose the Balassa method<sup>11)</sup> for its ease of interpretation. Corden's calculations are based on value added of traded goods and non-traded goods taken together, thus initiating a confusion concerning the impact of effective protection on gross production of single industries. The Balassa method, on the other hand, is based only on the value added of the industry under consideration. The value added of non-traded inputs is assumed to be constant and unaffected by the tariff system. To estimate the free trade value added of the branch under consideration the coefficients of non-traded inputs ( $\alpha_{kj}$ ) are broken down into their shares of value added ( $\beta_{rk}$ ), traded inputs ( $\alpha_{ik}$ ) and non-traded inputs ( $\alpha_{mk}$ ), and only the traded inputs  $\alpha_{ik}$  are deflated with the corresponding tariffs  $t$ . Adding this to our formula we get:

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10) Corden, The Structure, op. cit., p. 226 sqq.

11) B. Balassa et al., The Structure of Protection in Developing Countries (Baltimore and London, 1971), pp. 17 sqq and pp. 321 sqq.

$$E_j = \frac{1 - A_j - \sum_i \alpha_{ij} - \sum_k \alpha_{kj}}{\frac{d_j}{1+t_j} + (1-d_j) - \sum_x \frac{A_j \gamma_{xj}}{1+t_x} - \sum_i \frac{\alpha_{ij}}{1+t_i} - \sum_{kr} \alpha_{kj} \beta_{rk} - \sum_{ki} \frac{\alpha_{kj} \alpha_{ik}}{1+t_i} - \sum_{km} \alpha_{kj} \alpha_{mk}} - 1$$

The impact of tariffs on the prices of non-traded inputs is estimated more accurately the more often this decomposition is carried out. But because the increase of accuracy diminishes very quickly, we considered only the last two production levels of non-traded inputs. Thus emerges our final formula for the calculation of effective rates of tariff protection:

Formula for Calculating the Effective Rate of Tariff Protection

$$1 - A_j - \sum_i \alpha_{ij} - \sum_k \alpha_{kj}$$

$$E_j = \frac{\frac{d_j}{1+t_j} + (1-d_j) \frac{A_j \cdot \gamma_{xj}}{\sum_x \frac{1}{1+t_x}} - \sum_i \frac{\alpha_{ij}}{1+t_i} - \sum_{kr} \alpha_{kj} \beta_{rk} - \sum_{ki} \frac{\alpha_{kj} \alpha_{ik}}{1+t_i} - \sum_{kmr} \alpha_{kj} \alpha_{mk} \beta_{rm} - \sum_{kmi} \frac{\alpha_{kj} \alpha_{mk} \alpha_{im}}{1+t_i} - \sum_{kmw} \alpha_{kj} \alpha_{mk} \alpha_{wm}}{1 - A_j - \sum_i \alpha_{ij} - \sum_k \alpha_{kj}} - 1$$

Symbols

- $E_j$  Effective tariff rate of industry j
- $A_j$  Depreciation coefficient of industry j
- $\gamma_{xj}$  Fraction of the investment-good x of the total investment of industry j for the year under consideration
- $\alpha_{ij}$  Input coefficient of traded inputs i, which are used in industry j
- $\alpha_{kj}$  Input coefficient of non-traded inputs k, which are used in industry j
- $\beta_{rk}$  Input coefficient of the primary factors r necessary to produce the non-traded inputs k
- $\alpha_{ik}$  Input coefficient of traded inputs i necessary to produce the non-traded inputs k
- $\alpha_{mk}$  Input coefficient of the non-traded inputs m necessary to produce the non-traded inputs k
- $\beta_{rm}$  Input coefficient of the primary factors r necessary to produce the non-traded inputs m
- $\alpha_{im}$  Input coefficient of traded inputs i necessary to produce the non-traded inputs m
- $\alpha_{wm}$  Input coefficient of non-traded inputs w necessary to produce the non-traded inputs m
- $d_j$  Domestic turnover of industry j as fraction of j's total turnover
- $t_j$  Nominal rate of tariff protection of industry j
- $t_x$  Tariff rate of investment-good x
- $t_i$  Tariff rate of the traded inputs i

## III. DATA

12. Effective tariff rates as well as effective rates of protection have been calculated for different years to measure not only the current distortion of the structural pattern of industry in comparison to a free trade situation, but also the changes in the distortion arising from changes in the tariff structure. To account for the European economic integration starting in 1959 and the subsequent trade agreements of the Kennedy Round (1963-1967), the years 1958-1972 were chosen as the period under observation. But as the compilation and preparation of data were rather difficult and extremely time-consuming, effective rates have been calculated only

- for 1958, the year prior to the establishment of the EEC,
- for 1964, when the harmonisation of the external tariffs had been completed in all EEC countries,
- for 1970, when all internal tariffs within the EEC had been abolished, and
- for 1972, the last year of tariff reductions resulting from the Kennedy Round (only tariff protection).

In 1958 and 1964 there was a multiple West German tariff scheme for items covered by the agreements of the European Coal and Steel Community in 1958, and in 1964, for all trade with EEC countries. Therefore the effective protection against suppliers within the EEC and against non-EEC suppliers was calculated separately. Since in 1970 and 1972 the tariff protection of German producers against EEC competitors had been removed, the protection against imports from non-EEC

countries for these years was estimated alone.<sup>12)</sup> Unfortunately we could not include in our calculations the special regulations for associates of the EEC and the tariff reductions for certain imports from developing countries, which came into operation on July 1, 1973. But as a short analysis of these regulations will show (Section V) our results are not affected by this omission.

13. The basic data for our computations were drawn from the official German<sup>13)</sup> and EEC tariff schedules<sup>14)</sup> which provide nominal tariff rates in the four-digit "Brusseles-Tariff-Nomenclature" (BTN) with its sub-divisions. These approximately 5,000 tariff rates were attached to the respective items of the applied input-output matrix by

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12) Since the Common External Tariff is the same for all member countries, the reader might feel inclined to extend the applicability of the German effective rates of protection against non-EEC suppliers to any EEC country. It has to be stressed, however, that the results depend heavily on the underlying production structure. Only if the applied technology and the product mix do not differ significantly from one country to another, may effective rates of one country reflect the protection of another country's producers as well. Although we did not make inquiries into this subject, there is some evidence for a similarity of production structures between the member countries, which could justify an extended application of our results. Nevertheless we prefer to restrict our analysis to West Germany.

13) Deutscher Zolltariff 1958, Bundesgesetzblatt Teil I, Jg. 1957, Nr. 53; Deutscher Zolltariff 1965, Anlageband zum Bundesgesetzblatt Teil II, Jg. 1964 and Bundesgesetzblatt Teil II, Jg. 1969, Nr. 91.

14) Amtsblatt der Europäischen Gemeinschaft, 13. Jgg. (1970) Nr. L1 and 15 Jgg. (1972), Nr. L1.



transforming them into the classification of this matrix<sup>15)</sup> which is almost equal to the official German "Commodity Classification for Industry Statistics." The data concerning the production structure were computed on the basis of the most highly disaggregated input-output tables for the West German industry, which were made available by the Ifo Institute for Economic Research, Munich, for 1961-1964.<sup>16)</sup> Although these tables show the input structure of only 39 manufacturing sectors, they have the advantage that the inputs are disaggregated into about 5,000 items, thus allowing for a very precise computation of free trade input coefficients. Furthermore these tables are constructed according to the principle that only similar production activities should be put together in one sector, that is, the different industrial sectors are not defined on the basis of companies or firms but on the basis of goods. Therefore our results refer to certain goods, which is the required information, and not to firms.

14. The computation of effective tariff rates for 1958 is based on the input-output matrix for 1961; the 1964 table was used for all other

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15) In fact, a double transformation was necessary. First we transformed the tariff rates from the four-digit BTN into the German six-digit "Commodity Classification for Foreign Trade." Then we were able to make use of a transformation matrix provided by the Ifo-Institut für Wirtschaftsforschung, Munich, to translate the rates from the foreign trade classification into the classification of the applied input-output matrix.

16) G. Gehrig et al., Ergebnisse der Input-Output Rechnung 1961-1964 (Ifo-Institut für Wirtschaftsforschung, Munich, Input-Output-Studien, Vol. 6-9).

years under observation. Since no updated input-output tables with the same internal structure are available, this procedure was inevitable. Sensitivity tests have proved, however, that changes of the production structure, occurring within the time span under consideration, are negligible insofar as they do not distort our results.<sup>17)</sup>

#### IV. THE EFFECTIVE TARIFF PROTECTION OF WEST GERMAN INDUSTRY

15) The nominal tariff rates<sup>18)</sup> and the effective tariff rates for thirty-seven branches of West German industry are shown in Tables 1-4<sup>19)</sup> and are illustrated in Graphs 1 and 2. The changes of nominal tariff rates over time can be divided into three components:

- the tariff reductions between the EEC member countries which started in 1959 (or were continued for goods of the coal and steel industries) and had been finished largely in 1964 and completely in 1968;
- the harmonisation of external tariffs which was completed in 1964;
- the reduction of Common External Tariffs on the basis of the Kennedy Round agreements.

The average nominal tariff rate for non-EEC imports of all industrial sectors as a whole increased significantly until 1964 and subsequently

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17) For the sensitivity tests see U. Hiemenz and K.v. Rabenau, Effektive Protektion - Theorie und Berechnung für die westdeutsche Industrie (Tübingen, 1973), pp. 139 sqq.

18) The nominal tariff rate  $t_i$  for each industry is the weighted average of the tariff rates for the  $j$  various goods produced in this industry. The values of gross production were used as weights, although another weighting scheme - for example value added - might be preferable for theoretical reasons. But data availability again limited our efforts.

19) Some results are marked as preliminary by putting them into brackets. The different reasons for this will be explained in the following paragraphs.

Nominal and Effective Rates of Tariff Protection <sup>a,b</sup> against Imports from EEC Countries  
and against Imports from non-EEC Countries for Branches of Industry, West Germany

1958

Branch of Industry	Nominal Tariff Protection		Effective Tariff Protection	
	Against Imports From			
	EEC-Countries	non-EEC-Countries	EEC-Countries	non-EEC-Countries
<u>Mining Products</u>	1.6	1.6	1.1	1.0
Coal Mining, Coking	0.9	0.9	0.0	0.0
Lignite and Bituminous Coal Mining	0.0	0.0	2.3	2.4
Crude Oil, Natural gas, etc.	17.3	17.3	27.8	27.8
Other Mining	3.5	3.5	4.3	3.6
<u>Primary and Producers' Goods Industries</u>	7.4	8.9	12.1	17.3
Stone and Earthen Goods	3.3	3.3	1.2	1.1
Iron and Steel Production	2.6	6.9	6.6	22.7
Iron, Steel and Malleable Iron Foundries	7.7	7.7	12.5	11.3
Drawing Plants and Cold Rolling Mills	8.6	10.3	11.6	4.9
Non-ferrous Metal Production	6.3	6.3	22.2	22.2
Non-ferrous Metal Foundries	11.2	11.2	31.2	31.2
Mineral Oil Processing <sup>c</sup>				
Chemical Products and Coal Derivatives	13.0	13.0	13.8	13.8
Sawmills and Woodworking	5.1	5.1	12.8	12.7
Pulp, Paper and Paperboard Production	11.5	11.5	35.8	35.8
Rubber and Asbestos Goods	15.0	15.0	22.9	22.9
<u>Investment-Goods Industries</u>	8.6	8.6	5.9	4.6
Structural and Light Metal Engineering Goods	5.2	5.2	3.0	0.7
Steel Shaping	12.0	12.1	18.2	14.5
Mechanical Engineering Goods	6.6	6.3	1.4	0.9
Manufacture of Road Vehicles	12.9	12.9	11.1	9.8
Shipbuilding	0.1	0.1	(- 12.0)	(- 13.8)
Manufacture of Aircraft	8.6	3.6 <sup>d</sup>	(20.0)	(20.2)
Electrical Engineering Goods	7.8	7.8	5.0	4.7
Precision and Optical Goods	6.8	6.8	3.1	3.3
Clocks and Watches	5.9	5.9	2.4	2.6
Iron, Steel, Sheet and Metal Goods	9.7	9.7	10.1	7.5
<u>Consumer-Goods Industries</u>	12.0	12.0	17.3	17.3
Fine Ceramics Products	9.7	9.7	8.4	8.4
Glass and Glass Products	15.3	15.3	14.9	14.9
Manufacture of Wood Products	13.3	13.3	19.6	19.9
Musical Instruments, Sporting Goods, Toys	8.7	8.7	5.7	5.8
Paper and Paperboard Products	15.0	15.0	24.4	24.4
Printing and Reproduction	6.5	6.5	3.8	3.8
Plastic Products	13.8	13.8	7.9	7.9
Leather (Production, Tanning)	7.6	7.6	9.8	9.8
Leather Goods	12.6	12.6	16.6	16.6
Shoes	14.2	14.2	22.3	22.3
Textiles	11.1	11.1	20.3	20.3
Clothing	13.6	13.6	17.7	17.7
<u>Total Industry</u>	8.5	9.0	10.4	11.8

<sup>a</sup>On the basis of official German Tariff Regulations for 1958, taking into consideration the goods from the free trade of the European Coal and Steel Community 1958. - <sup>b</sup>On the basis of the Input-Output Matrix of the Ifo Institute for Economic Research, Munich, for the year 1961. - <sup>c</sup>Specific tariffs.

Source: Personal Calculation

Nominal and Effective Rates of Tariff Protection <sup>a,b</sup> against Imports from EEC Countries  
and against Imports from non-EEC Countries for Branches of Industry, West Germany

1964

Branch of Industry	Nominal Tariff Protection		Effective Tariff Protection	
	Against Imports From			
	EEC-Countries	non-EEC-Countries	EEC-Countries	non-EEC-Countries
<u>Mining Products</u>	0.1	0.5	- 0.2	- 1.4
Coal Mining, Coking	0.0	0.4	- 0.3	- 1.3
Lignite and Bituminous Coal Mining	0.0	0.0	- 0.4	- 3.1
Crude Oil, Natural gas, etc.	0.0	0.1	- 2.2	-13.9
Other Mining	0.5	2.0	0.6	0.8
<u>Primary and Producers' Goods Industries</u>	1.3	9.7	2.5	20.2
Stone and Earthen Goods	0.9	7.9	1.2	11.5
Iron and Steel Production	0.4	7.2	1.7	25.5
Iron, Steel and Malleable Iron Foundries	1.3	11.9	2.0	19.1
Drawing Plants and Cold Rolling Mills	1.8	10.2	2.6	6.7
Non-ferrous Metal Production	1.0	6.6	3.5	28.3
Non-Ferrous Metal Foundries	2.2	14.4	5.7	47.1
Mineral Oil Processing	0.0	4.1	- 0.1	6.6
Chemical Products and Coal Derivatives	2.5	14.3	3.5	18.7
Sawmills and Woodworking	1.4	7.3	3.2	15.9
Pulp, Paper and Paperboard Production	2.2	12.6	6.3	41.3
Rubber and Asbestos Goods	3.1	16.3	4.6	24.8
<u>Investment-Goods Industries</u>	1.3	11.8	0.7	8.0
Structural and Light Metal Engineering Goods	0.6	7.7	0.0	5.0
Steel Shaping	2.3	14.2	3.3	18.1
Mechanical Engineering Goods	1.1	9.6	0.3	3.5
Manufacture of Road Vehicles	2.3	15.9	2.0	12.6
Shipbuilding	0.0	0.8	(- 2.5)	(- 13.4)
Manufacture of Aircraft	0.0	4.0	(- 1.9)	(- 3.0)
Electrical Engineering Goods	0.3	11.5	- 0.5	8.0
Precision and Optical Goods	1.3	11.5	0.6	6.6
Clocks and Watches	0.3	8.9	- 0.2	3.9
Iron, Steel, Sheet and Metal Goods	1.8	13.1	1.8	12.9
<u>Consumer-Goods Industries</u>	2.4	14.3	3.2	20.6
Fine Ceramics Products	1.7	14.9	1.6	16.1
Glass and Glass Products	3.1	17.5	3.9	21.8
Manufacture of Wood Products	1.7	14.8	1.9	20.7
Musical Instruments, Sporting Goods, Toys	1.4	13.0	0.9	10.2
Paper and Paperboard Products	3.4	17.0	5.3	24.8
Printing and Reproduction	1.3	8.8	1.1	8.4
Plastic Products	2.5	17.7	1.6	11.8
Leather (Production, Tanning)	2.4	8.8	3.1	11.7
Leather Goods	2.7	15.8	3.1	21.1
Shoes	2.9	17.1	3.9	26.3
Textiles	2.6	12.7	4.5	24.0
Clothing	2.8	16.5	2.7	22.3
<u>Total Industry</u>	1.4	11.0	1.9	14.8

<sup>a</sup> On the basis of domestic and external tariffs of the common tariff rates for the year 1964. -  
<sup>b</sup> Input-Output Matrix of the Ifo Institute for Economic Research, Munich, for the year 1964.

Source: Personal Calculation

Nominal and Effective Rates of Tariff Protection <sup>a,b</sup> against Imports from non-EEC-Countries  
for Branches of Industry, West Germany

1970

Branch of Industry	Nominal Tariff Protection	Effective Tariff Protection
<u>Mining Products</u>	0.3	- 1.1
Coal Mining, Coking	0.0	- 1.4
Lignite and Bituminous Coal Mining	0.0	- 2.5
Crude Oil, Natural gas, etc.	0.7	- 9.2
Other Mining	2.7	3.0
<u>Primary and Producers' Goods Industries</u>	7.9	16.2
Stone and Earthen Goods	4.4	5.0
Iron and Steel Production	5.5	20.6
Iron, Steel and Malleable Iron Foundries	9.8	15.7
Drawing Plants and Cold Rolling Mills	8.7	6.5
Non-ferrous Metal Production	6.0	25.2
Non-ferrous Metal Foundries	11.2	34.1
Mineral Oil Processing	7.3	13.0
Chemical Products and Coal Derivatives	11.4	13.3
Sawmills and Woodworking	5.3	11.1
Pulp, Paper and Paperboard Production	10.0	33.4
Rubber and Asbestos Goods	10.3	13.6
<u>Investment-Goods Industries</u>	9.1	5.9
Structural and Light Metal Engineering Goods	5.5	2.8
Steel Shaping	9.4	10.9
Mechanical Engineering Goods	7.9	3.3
Manufacture of Road Vehicles	11.2	8.3
Shipbuilding	0.7	(- 11.3)
Manufacture of Aircraft	6.3	(5.5)
Electrical Engineering Goods	9.5	6.8
Precision and Optical Goods	10.2	6.2
Clocks and Watches	8.3	4.0
Iron, Steel, Sheet and Metal Goods	10.2	9.7
<u>Consumer-Goods Industries</u>	11.9	17.5
Fine Ceramics Products	14.6	16.4
Glass and Glass Products	12.6	14.9
Manufacture of Wood Products	11.0	15.0
Musical Instruments, Sporting Goods, Toys	11.5	9.3
Paper and Paperboard Products	15.3	23.4
Printing and Reproduction	7.2	7.3
Plastic Products	14.0	8.7
Leather (Production, Tanning)	7.7	10.1
Leather Goods	12.3	15.5
Shoes	10.0	13.2
Textiles	11.0	21.2
Clothing	14.7	21.5
<u>Total Industry</u>	8.8	11.9

<sup>a</sup>On the basis of the common tariff rates for the year 1970. - <sup>b</sup>On the basis of the Input-Output Matrix of the Ifo Institute for Economic Research, Munich, for the year 1954.

Source: Personal Calculation

Nominal and Effective Rates of Tariff Protection <sup>a,b</sup> against Imports from non-EEC-Countries  
for Branches of Industry, West Germany

1972

Branch of Industry	Nominal Tariff Protection	Effective Tariff Protection
<u>Mining Products</u>	0.1	- 1.4
Coal Mining, Coking	0.0	- 1.4
Lignite and Bituminous Coal Mining	0.0	- 1.9
Crude Oil, Natural gas, etc.	0.0	- 9.2
Other Mining	1.1	- 0.1
<u>Primary and Producers' Goods Industries</u>	6.8	13.9
Stone and Earthen Goods	3.3	3.7
Iron and Steel Production	4.5	17.0
Iron, Steel and Malleable Iron Foundries	7.7	12.1
Drawing Plants and Cold Rolling Mills	7.5	5.6
Non-ferrous Metal Production	5.5	22.0
Non-ferrous Metal Foundries	8.6	23.0
Mineral Oil Processing	3.8	6.5
Chemical Products and Coal Derivatives	11.2	14.4
Sawmills and Woodworking	6.1	13.7
Pulp, Paper and Paperboard Production	9.4	29.6
Rubber and Asbestos Goods	7.7	8.7
<u>Investment-Goods Industries</u>	6.9	4.0
Structural and Light Metal Engineering Goods	4.0	1.4
Steel Shaping	7.7	8.9
Mechanical Engineering Goods	6.2	2.5
Manufacture of Road Vehicles	8.6	5.8
Shipbuilding	0.4	(- 10.1)
Manufacture of Aircraft	3.2	(- 0.9)
Electrical Engineering Goods	7.2	4.5
Precision and Optical Goods	8.4	5.2
Clocks and Watches	7.3	3.7
Iron, Steel, Sheet and Metal Goods	7.2	5.6
<u>Consumer-Goods Industries</u>	10.4	15.6
Fine Ceramics Products	9.4	9.9
Glass and Glass Products	9.5	11.1
Manufacture of Wood Products	8.0	9.9
Musical Instruments, Sporting Goods, Toys	9.3	6.9
Paper and Paperboard Products	13.2	19.9
Printing and Reproduction	6.1	5.3
Plastic Products	14.3	9.8
Leather (Production, Tanning)	6.7	-11.1
Leather Goods	8.5	9.6
Shoes	7.3	9.0
Textiles	10.3	20.8
Clothing	14.0	20.7
<u>Total Industry</u>	7.3	10.0

<sup>a</sup>On the basis of the common tariff rates for the year 1972. - <sup>b</sup>On the basis of the Input-Output Matrix of the Ifo Institute for Economic Research, Munich, for the year 1964.

Source: Personal Calculation

was reduced to 8.8 per cent in 1970, that is, to about the level of 1958. In 1972 the average tariff rate was 7.3 per cent.

16. The internal nominal tariff rate for industry as a whole decreased from 9 per cent to 1.4 per cent between 1958 and 1964 (Tables 1 and 2), resulting in a simultaneously diminishing effective rate from 10.4 per cent to 1.9 per cent. On the other hand, West Germany had to increase her nominal external tariff rates by 2 per cent on an average to achieve the average level of external tariffs of the member countries. Thus the effective tariff rate rose by 3 percentage points. This increase has been more than offset by the tariff reductions agreed upon in the Kennedy Round. Compared to the situation prior to the establishment of the EEC, the average level of West German tariffs against non-member countries was lower in 1972 (7.3 per cent against 9 per cent). Therefore, today there is no evidence of a discrimination towards non-EEC countries, which temporarily existed, as far as tariffs are concerned.
  
17. The tariff changes following the European economic integration and the Kennedy Round had only little influence on the structural pattern of nominal and effective tariff rates. As rank correlations between the different tariff vectors shown in Tables 1-4 prove, the hierarchy of tariff rates changed slightly from 1958 to 1964, but hardly changed after 1964. This means that the external tariffs were increased in a non-linear manner followed by a linear reduction in the Kennedy Round.

Table 5: Spearman Rank Correlation Coefficients Between Nominal and Effective Tariff Rates for Branches of Industry

	Rank correlation coefficients between			
	1958 and 1964		1964 and 1970	1970 and 1972
	EEC-Countries	non-EEC Countries	non-EEC Countries	non-EEC Countries
Nominal tariff rates	0.78	0.78	0.92	0.95
Effective tariff rates	0.72	0.75	0.94	0.95

All coefficients are significant at the 0.1 per cent level.

18. One of the most important results of our calculations stems from the evidence that in all years under observation the effective tariff protection exceeded nominal tariffs by about one-third, on an average. This escalation effect appears because the import of raw materials and intermediate inputs such as energy, iron, transportation, services, crude steel, mineral oil, non-ferrous metals, wood and leather are either duty-free or have a lower tariff rate than the final products. Such a cascading tariff schedule results in a higher effective tariff protection compared to the nominal rates. Since most national tariff systems provide final manufactured products with higher tariffs than raw materials and intermediate inputs, escalation effects should be the rule. A number of empirical studies for different countries have



confirmed this assessment. Separate calculations by B. Balassa<sup>20)</sup> and G. Basevi<sup>21)</sup> in the Sixties show that the manufacturing sectors (ISIC classification Nr. 20-39) of the most important developed countries are - with few exceptions - more heavily protected in terms of effective tariffs than in terms of nominal tariffs. Similar results appear in more recent studies which have been carried out for the OECD<sup>22)</sup> and the IBRD<sup>23)</sup> on the protective systems of selected developing countries.

19. According to our analysis the escalation effect has proved to be especially strong in the primary and producers' goods industries and in the consumers' goods industries. For the former, the effective tariff rates were about double nominal rates; effective tariff protection of the latter amounted to 150 per cent of nominal protection. In addition these two groups of industries also enjoyed in absolute terms an effective protection above the average. In those branches, however, whose nominal tariffs on final products are lower than the tariffs on inputs the effective rates are below the nominal rates and may even become

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20) B. Balassa, "Tariff Protection in Industrial Countries: An Evaluation", Journal of Political Economy, 1965 (Vol. 73), pp. 573 sqq.

21) G. Basevi, "The U.S. Tariff Structure: Estimate of Effective Rates of Protection of U.S. Industries and Industrial Labour", The Review of Economics and Statistics, 1966 (Vol. 48), pp. 147 sqq.

22) I. Little, T. Scitovsky, M. Scott, Industry and Trade in Some Developing Countries: A Comparative Study (London, New York, Toronto, 1971).

23) B. Balassa et al., The Structure of Protection in Developing Countries (Baltimore/Md., London, 1971).

negative. This de-escalation effect can be observed in the case of the investment goods industries whose average effective tariff is about one-third lower than the nominal rate in all years under observation.

20. Graph 1 shows - for 1970<sup>24)</sup> - how escalation and de-escalation effects are distributed among the different groups of industries and how important they are. Taking into consideration the respective volume of turnover, the most important branches with a de-escalation effect are mechanical engineering goods, manufacture of road vehicles, and electrical engineering goods. All these commodity groups are marked by a high export intensity. Taken together, all groups with observed de-escalation effects produce more than half of West German exports.<sup>25)</sup>
- This leads to the conclusion that, especially for internationally highly competitive branches, the tariff scheme turns out to be less protective than estimated from the nominal tariff rates. An additional very export-intensive industry, chemical products, indeed shows an escalation effect, but this effect is lower than the average of all industries. In the field of escalation effects, those branches are dominating which suffer from heavy import competition: iron and steel production, non-ferrous metal production, textiles and clothing, pulp,

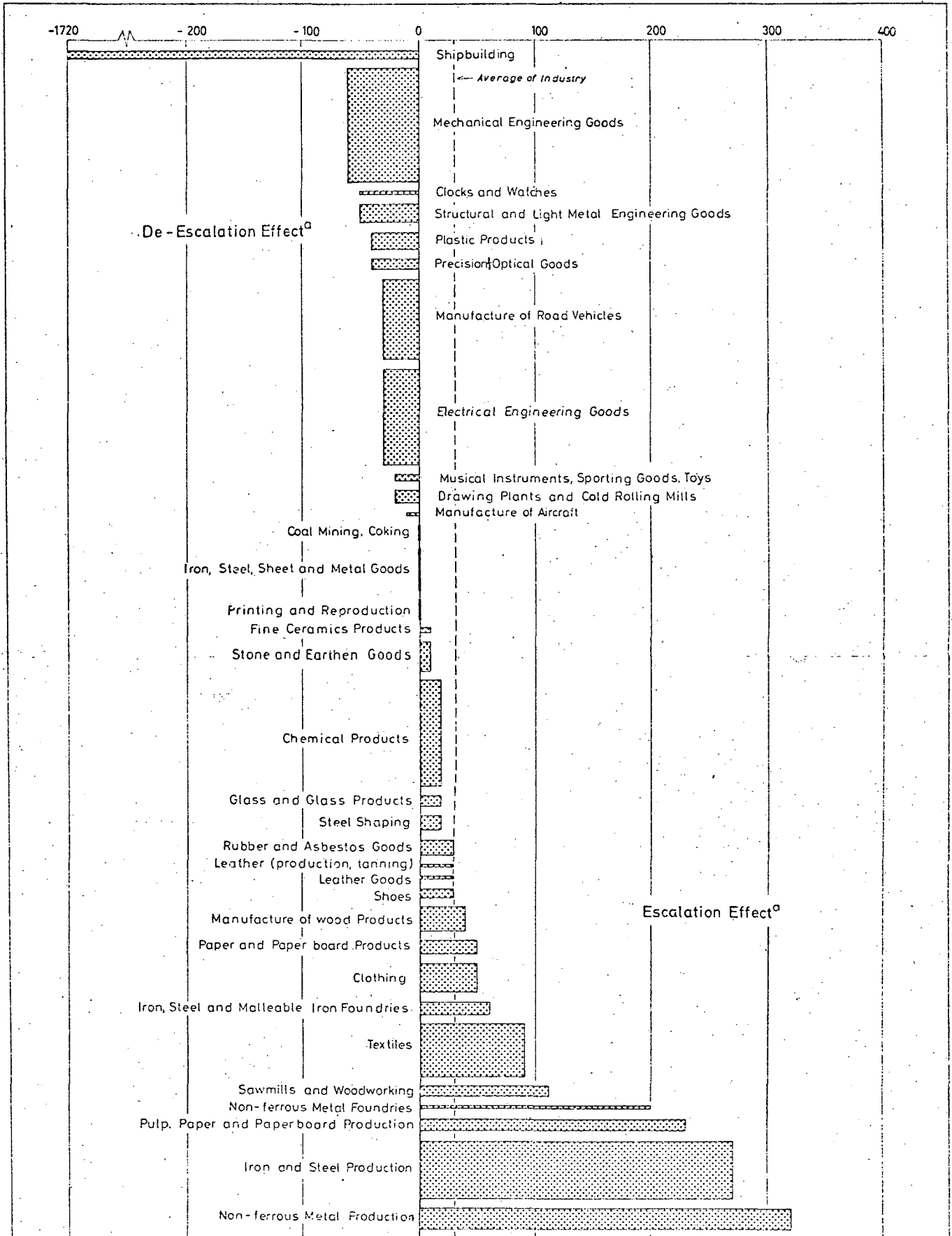
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<sup>24)</sup> The interpretation of the results mainly refers to 1970, because it was impossible to calculate effective rates of protection for 1972; therefore, 1970 is the most recent year for a comparison of effective tariff rates and effective rates of total protection.

<sup>25)</sup> See Table 7.

Graph 1

RELATION OF EFFECTIVE TO NOMINAL TARIFF RATES<sup>a</sup> 1970<sup>b</sup>



De-escalation Effect<sup>a</sup>

Escalation Effect<sup>a</sup>

<sup>a</sup> Measured by  $\left(\frac{\text{Effective Tariff}}{\text{Nominal Tariff}}\right) \cdot 100$ . <sup>b</sup> The size of the blocks corresponds to the share of the respective industry in total turnover (1965).

paper and paperboard production.<sup>26)</sup> In these cases nominal tariffs veil the effective protection which is granted these raw material intensive branches.

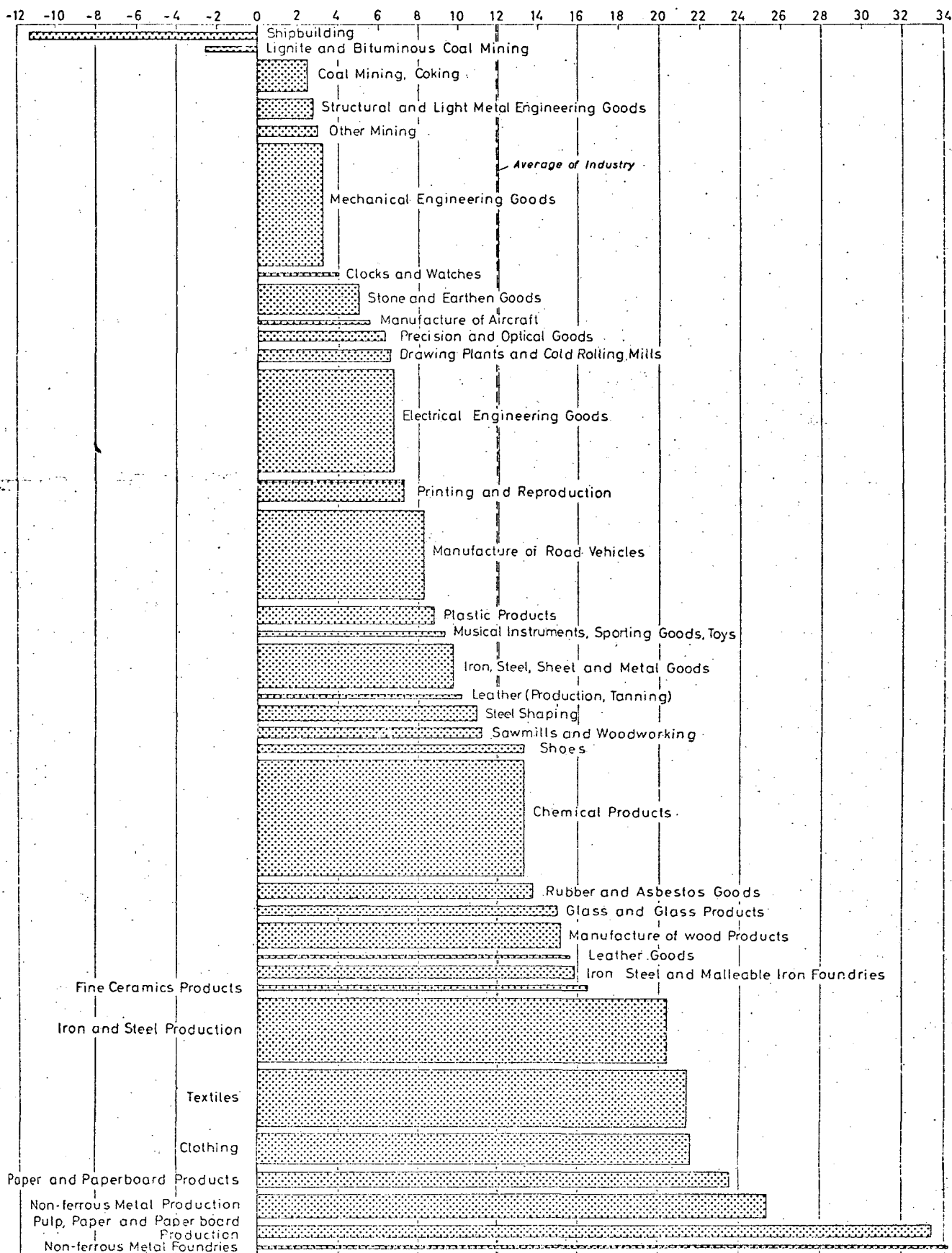
21. The above mentioned branches of industry with an escalation effect also show high effective tariff rates in absolute terms, whereas de-escalation effects in general are associated with effective rates below the average. With respect to the tariff protection, it can be stated therefore that heavily protected branches produce mainly for domestic markets, while industries with low effective tariff rates are export orientated in general (Graph 2 and Table 6). Accordingly there is evidence that the current tariff schedule maintains significant trade barriers in favour of less competitive industries but provides little protection to export industries which in fact do not need help against competitors.
22. At first glance it may be surprising that effective tariff rates for shipbuilding and - partly - for manufacture of aircraft turned out to be negative. Also there seems to be little protection for, or even discrimination against, mining activities, in nominal as well as in effective terms. The relevance of these rates, however, is very

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<sup>26)</sup> In 1970 the respective import quotas were 20.1, 55.1, 24.7 and 38.9 per cent, while the average import quota was 18.3 per cent. See Table 6.

# EFFECTIVE TARIFF RATES TOWARDS NON-MEMBER COUNTRIES 1970<sup>a</sup>

- Weighted with the share in total turn-over -



<sup>a</sup> The size of the blocks corresponds to the share of the respective industry in total turnover (1969)

limited as far as actual protection is concerned, because those industries are heavily subsidized by special tariff exemptions<sup>27)</sup> which we could not include in our calculations for computational reasons.<sup>28)</sup>

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27) The negative effective tariff rates for shipbuilding do not indicate a discrimination against this industry. Indeed German producers of inputs for shipbuilding are granted higher nominal tariffs than those for shipbuilding, but simultaneously all inputs for warships, sea-going vessels and tugboats are imported duty-free according to § 27 "Deutsches Zollgesetz" and to the special regulations of the Common Tariff. The effective tariff protection for this section of shipbuilding, which is by far the largest with respect to turnover, can be estimated at zero, because in all years under observation tariffs on final goods as well as on inputs did not exist or were not efficient. The production of other vessels, especially inland vessels, had a nominal protection ranging from 4.2 to 7.4 per cent in 1970. As it can be assumed that this matches the tariff burden on inputs, the effective tariffs for such ships range from 4 to 7 per cent also. But it has to be stressed that the competitiveness of West German shipbuilding is mainly guaranteed by a comprehensive system of subsidies.

The effective tariff rates of aircraft manufacturing are also estimated too low because since 1960 the tariff rates on inputs were mostly out of operation (Protokoll der Mitgliedsstaaten der Europäischen Wirtschaftsgemeinschaft, Nr. XVII, Bundesgesetzblatt, Teil II, Jg. 1961, p. 350; remarks to tariff number 8803 of the Deutscher Zollltariff 1962 and of the Common Tariff from December 8, 1969; further appendix I to the Common Tariff from December 17, 1970). Regarding the relatively small share of value added in the volume of production (30 per cent), one may conclude that the effective tariff rates are much higher than the nominal rates and not lower, as calculated for 1964, 1970 and 1972.

Concerning pit coal mining, zero tariffs on coal were chosen for 1970 and 1972, although the Common Tariff schedule shows positive nominal rates for those years. These nominal tariffs are actually inefficient because pit coal was traded within the limits of duty-free quotas only. Thus our computation of effective tariff rates was correct, but the reader has to keep in mind that the total protection of pit coal mining is of course influenced by the above import quotas and by substantial government support (Section VI and Table 8).

28) We had to attach a single tariff rate to each input and were not able to take into consideration different rates on a single input.

Import Share in Total Domestic Supply for the Branches of Industry - West Germany<sup>a</sup>

1959 - 1970

Branch of Industry	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968 <sup>b</sup>	1969 <sup>b</sup>	1970 <sup>b</sup>
Coal Mining	10.5	7.2	6.8	7.1	7.6	6.7	7.1	7.2	7.6	6.6	7.3	8.8
Crude Oil, Natural Gas, etc.	65.6	70.8	73.6	74.1	75.7	86.7	86.9	87.5	87.7	88.4	86.8	85.3
Stone and Earthen Goods	7.6	8.8	8.1	7.6	7.7	7.8	8.4	8.6	9.1	10.2	10.3	9.5
Iron and Steel Production	14.1	13.7	12.8	14.4	15.0	15.9	16.0	15.9	16.0	21.4	20.4	20.1
Iron, Steel and Malleable Iron Foundries	2.0	1.6	1.7	1.9	1.6	1.9	2.1	1.7	1.9	2.8	2.8	2.8
Drawing Plants and Cold Rolling Mills	2.5	2.5	3.0	3.4	4.3	5.4	6.9	7.1	7.7	9.3	10.2	10.7
Non-ferrous Metal Production	45.6	47.7	46.2	45.2	44.9	47.9	52.2	53.9	56.5	58.2	57.7	55.1
Non-ferrous Metal Foundries	0.3	0.4	0.6	0.5	1.0	1.5	2.0	1.4	1.5	1.7	1.4	1.4
Mineral Oil Processing	11.2	10.6	9.1	12.7	12.7	11.9	9.8	10.3	11.8	11.9	11.8	12.7
Chemical Products	10.7	12.3	11.6	11.8	12.6	13.7	15.1	15.4	16.2	17.3	19.1	19.8
Sawmills and Woodworking	26.1	27.6	26.3	26.2	26.7	27.4	28.1	26.9	24.1	25.6	26.6	27.4
Pulp, Paper and Paperboard Production	23.0	26.3	26.9	28.3	30.1	32.7	34.4	34.7	33.3	37.1	39.2	38.9
Rubber and Asbestos Goods	5.0	6.2	6.9	8.3	9.7	10.7	12.2	13.9	14.6	13.1	13.8	14.6
Structural Engineering	1.0	1.2	1.4	1.7	1.6	1.8	2.3	1.9	2.1	2.5	2.8	3.6
Steel Shaping	2.1	2.1	2.5	2.9	3.2	2.9	3.4	3.6	3.6	3.9	4.5	4.7
Mechanical Engineering Goods	9.9	11.5	12.9	13.4	13.3	14.0	15.7	16.3	17.0	19.6	19.2	16.9
Manufacture of Road Vehicles and Aircraft	9.0	7.7	7.2	9.1	9.2	10.2	12.8	14.9	17.1	17.8	17.3	19.8
Shipbuilding	5.2	6.7	3.8	4.0	5.5	3.9	9.8	9.3	10.0	11.2	19.1	22.6
Electrical Engineering Goods	4.2	4.7	5.4	6.5	6.3	6.8	8.3	8.8	9.4	10.8	11.8	12.9
Precision and Optical Goods, Clocks and Watches	12.2	13.3	14.2	15.3	18.6	19.6	20.4	23.0	25.2	27.3	27.8	27.3
Iron, Steel, Sheet and Metal Goods	3.4	4.6	5.5	5.3	5.7	5.9	6.8	7.9	7.6	8.8	9.2	9.9
Non-metallic Ceramics Products	4.5	5.0	6.0	6.9	8.0	9.1	11.7	14.0	13.8	16.1	16.1	17.7
Plastics and Glass Products	4.2	5.5	5.8	5.9	6.8	8.3	11.1	10.5	10.5	12.7	13.9	14.9
Manufacture of Wood Products	3.4	4.0	3.9	4.2	4.8	5.1	5.4	5.3	4.7	5.2	5.2	5.6
Musical Instruments, etc.	20.8	23.3	24.3	26.6	28.2	31.0	35.0	38.5	37.5	40.5	42.0	42.3
Textile and Paperboard Products	1.7	2.0	2.2	2.5	2.7	2.9	3.2	3.2	3.4	3.9	4.5	4.6
Dyeing	2.8	2.9	3.0	3.1	2.9	3.2	3.5	3.7	3.9	4.3	4.5	4.3
Plastic Products	2.5	2.8	3.2	3.6	4.1	4.0	4.8	5.9	6.3	11.0	12.7	12.7
Leather (Production, Tanning)	14.4	15.6	18.4	19.9	20.3	19.0	21.1	24.1	21.8	41.4	44.7	41.8
Leather Goods	3.6	3.8	4.7	5.8	7.2	7.6	9.4	10.7	9.7	11.7	13.4	14.5
Textiles	5.4	6.5	6.8	7.6	9.2	10.3	12.2	15.1	14.4	19.0	21.5	21.4
Articles	14.7	16.0	16.5	17.5	18.5	19.0	21.2	21.6	20.0	22.3	24.1	24.7
Clothing	3.7	4.4	5.0	5.9	6.6	7.3	8.9	10.3	9.6	11.7	14.7	14.9
Total Industry	11.1	12.0	11.7	12.2	12.5	13.3	14.6	15.1	15.4	17.4	18.1	18.3

<sup>a</sup>Including Berlin (West) and Saarland. - <sup>b</sup>Excluding value added tax.

Export Share in Total Domestic Supply for the Branches of Industry - West Germany<sup>a</sup>

1959 - 1970

Branch of Industry	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968 <sup>b</sup>	1969 <sup>b</sup>	1970 <sup>b</sup>
Coal Mining	27.1	24.6	24.9	24.6	25.0	24.2	23.7	24.2	25.4	28.4	26.0	26.8
Crude Oil, Natural Gas, etc.	0	0	0	0	0	0	0.2	1.9	1.5	0.4	1.3	1.6
Stone and Earthen Goods	5.0	5.1	5.2	4.6	4.6	4.5	4.9	5.1	5.7	6.5	6.5	6.0
Iron and Steel Production	21.0	22.0	22.7	22.2	22.6	20.6	23.8	24.1	29.4	28.1	24.8	23.7
Iron, Steel and Malleable Iron Foundries	4.3	3.6	3.3	3.7	4.2	4.9	3.9	4.2	5.5	5.7	5.6	5.6
Rolling Plants and Cold Rolling Mills	18.6	19.0	19.1	19.3	18.0	16.7	17.4	19.6	23.9	23.2	21.9	24.0
Non-ferrous Metal Production	26.7	22.1	21.6	22.9	22.8	22.1	26.2	35.8	36.8	36.4	30.9	29.3
Non-ferrous Metal Foundries	1.7	1.6	1.8	2.6	2.5	2.7	2.9	3.1	3.6	3.3	3.3	2.9
Crude Oil Processing	6.5	5.7	7.6	6.6	6.9	7.3	6.2	6.2	6.4	6.5	5.8	5.9
Chemical Products	25.7	26.0	25.6	25.4	27.2	27.8	27.9	30.8	32.9	33.5	34.0	34.5
Mills and Woodworking	5.7	6.1	5.4	5.5	6.3	7.1	7.1	7.8	10.1	11.1	9.7	8.8
Ship, Paper and Paperboard Production	6.0	7.1	7.3	7.7	8.3	8.4	8.4	9.6	11.1	12.4	13.7	14.7
Fiber and Asbestos Goods	13.2	13.3	12.5	12.7	13.5	13.9	14.0	16.3	19.6	17.9	17.3	16.9
Structural Engineering	12.1	9.2	9.6	8.9	9.5	9.0	9.5	9.6	10.3	12.9	10.8	9.5
Steel Shaping	12.1	11.5	11.5	11.7	11.8	12.0	12.4	14.0	10.4	15.1	14.3	13.4
Mechanical Engineering Goods	36.3	35.9	37.3	37.3	39.1	39.5	38.9	42.6	47.4	50.4	45.8	42.8
Manufacture of Road Vehicles and Aircraft	34.3	32.2	29.7	32.0	35.0	36.0	38.1	39.6	43.6	47.9	45.1	43.3
Shipbuilding	40.7	61.6	40.8	34.1	40.0	34.5	31.1	33.6	29.1	39.5	42.3	31.9
Electrical Engineering Goods	19.9	18.5	18.4	19.2	19.9	20.3	20.5	21.9	24.4	25.1	24.7	23.6
Precision and Optical Goods, Clocks and Watches	46.0	44.2	42.7	43.3	52.3	48.2	45.7	46.2	49.3	52.4	50.7	48.1
Iron, Steel, Sheet and Metal Goods	25.7	26.8	26.0	20.1	19.7	19.8	19.4	21.7	24.7	26.0	25.4	24.8
Non-Ceramics Products	25.5	26.4	25.8	26.7	28.3	29.0	29.1	32.0	34.5	35.8	36.0	35.8
Glass and Glass Products	19.0	18.1	17.7	17.8	17.9	18.0	17.2	17.5	19.7	20.8	21.5	20.1
Manufacture of Wood Products	4.6	4.9	4.8	4.7	5.5	6.0	6.0	6.3	7.1	9.1	9.3	8.4
Medical Instruments, etc.	50.7	48.4	43.5	40.9	42.7	41.3	39.8	43.5	49.4	45.9	44.2	43.3
Text and Paperboard Products	5.0	3.9	4.0	3.9	4.4	4.5	4.7	5.2	5.8	6.8	7.1	7.2
Printing	6.6	6.5	6.5	6.5	6.8	7.2	7.5	8.0	9.4	10.2	10.2	9.6
Plastic Products	8.0	7.7	7.4	7.3	8.7	8.3	8.6	12.3	14.0	22.2	24.0	22.5
Leather (Production, Tanning)	11.8	11.5	12.1	12.8	13.3	13.4	14.6	16.5	18.4	31.0	31.1	30.8
Leather Goods	15.5	15.1	12.9	12.1	12.5	13.3	13.6	13.8	15.3	15.9	15.8	13.2
Textiles	2.1	2.2	2.6	2.6	3.5	4.0	4.1	4.4	5.9	8.4	9.7	8.6
Knitwear	9.6	9.9	9.7	10.1	11.5	12.2	12.8	13.5	15.5	16.3	17.6	17.8
Knitting	3.7	4.0	3.6	3.6	4.5	5.3	5.3	6.2	6.5	8.0	8.5	7.7
<b>Total Industry</b>	<b>17.4</b>	<b>17.5</b>	<b>17.3</b>	<b>17.1</b>	<b>18.1</b>	<b>18.3</b>	<b>18.6</b>	<b>20.3</b>	<b>22.3</b>	<b>23.9</b>	<b>23.5</b>	<b>23.0</b>
Excluding Berlin (West) and Saarland. - <sup>b</sup> Excluding value added tax												



Furthermore the protection of shipbuilding and pit coal mining mainly consists of nontariff trade barriers whose impact will be analysed in Section VI. The unexpected reduction of effective tariff protection for the extraction of oil from 27.8 per cent in 1958 to -13.9 per cent in 1964 is mainly caused by the complete cutback of tariffs on crude oil. The negative sign of effective tariff rates in 1964, 1970 and 1972 is brought about by the fact that nominal tariffs on inputs exceeded the protection of final goods, which was close to zero in all years in question.

#### V. TARIFF PREFERENCES FOR DEVELOPING COUNTRIES

23. The results for 1972 have to be modified in one respect: starting from June 1, 1971, effective tariff rates have been valid against most developing countries only beyond a certain volume of imports.<sup>29)</sup> Since that time non-reciprocal tariff preferences are granted to most developing countries<sup>30)</sup> by the EEC.<sup>31)</sup> The volume of duty-free trade was determined by the volume of EEC imports from the favoured countries in 1968 plus 5 per cent of the volume of EEC imports from all other countries. This import quota will be adjusted each year according to the above 5 per cent rule, the basic volume remaining unchanged.

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29) A minor qualification has to be added concerning the effective rates for 1964 and 1970. In 1963, the EEC agreed with 18 African associates to a complete reciprocal tariff reduction for all trade (Jaunde-Convention). But the trade volume between the EEC and those countries is rather insignificant, since most of them are listed among the poorest countries of the world (as measured by per capita income).

30) Up to now the agreement is applied to 91 independent countries and 47 dependent regions, but not to Greece, Malta, Portugal, Spain, Turkey (the OECD member countries), Israel, Cuba and Taiwan.

31) See Amtsblatt der Europäischen Gemeinschaften, 14. Jg. Nr. L 142, June 28, 1971.

24. In principle this regulation is applied to all products of manufacturing industry. But there are significant qualifications:

- Concerning manufactured agricultural products, only ten tariff items are included, and only those with low nominal tariff rates; further 140 items are granted only a small tariff reduction.
- The volume of duty-free imports is not equally determined for all manufactured products; no adjustments are planned, for example, for cotton textiles and mineral oil products.
- The imports of so-called "quasi-sensitive" and "sensitive" manufactured products are currently controlled and each EEC member country is allowed to cancel the preferences for these goods at any time. Furthermore the determined volume of imports of sensitive goods from favoured countries, which amounts to 54 per cent of all EEC imports from those countries, is distributed among the member countries according to a confirmed scheme.<sup>32)</sup>
- An important exception is made regarding the imports of textiles. Only member countries of the "International Agreement on Cotton and Textiles" (India, Jamaica, Colombia, Mexico, South Korea and Egypt) are favoured without restrictions.
- Each favoured developing country must not utilise more than 50 per cent of each product's duty-free quota. For quasi-sensitive and sensitive products, the country's share is even smaller for some items.

25. Summarizing, it can be stated: the preference scheme is broad-mindedly constructed for items in which developing countries cannot at all, or

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<sup>32)</sup> The distribution is not at all identical with the former pattern of exports from the developing countries to the EEC.

not yet, compete. For commodity groups, however, in which developing countries possess competitive export industries, preferences are especially scarce. Hopefully, tariff reductions will be extended for these items. But for the time being the predictive quality of the computed nominal and effective tariff rates is hardly affected because of the mentioned discrepancy between the preferences and the supply capacity and because of the small volumes of duty-free import quotas. The tariff protection of West German industry is not lessened by the preferences.

#### VI. THE TOTAL PROTECTION OF WEST GERMAN INDUSTRY

26. Effective rates of protection are superior to other measures of protection because they allow one to standardise the protective effects of totally different trade regulations and to express them in one comprehensive figure. In the case of West Germany the most important nontariff trade barriers<sup>33)</sup> which may cause a distortion of the structural pattern of industry are import quotas, subsidies and taxes. The consideration of nontariff distortions of international trade in the calculation of effective rates of protection necessitates first of all two basic changes in the general concept:
- calculations are based on net value added, that is, value added plus subsidies and minus indirect taxes.
  - all coefficients have to be calculated in relation to the value of gross production plus subsidies.

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<sup>33)</sup> For a general survey of nontariff trade regulations see R.E. Baldwin, Nontariff Distortions of International Trade (Washington D.C., 1970).

This leads to the following new basic formula:

$$E_j = \frac{1 - A'_j - \tau'_j{}^{\text{ind}} - \sum_i \alpha'_{ij}}{\frac{d_j}{1+t_j} + (1-d_j) - \sum_x \frac{A'_j \gamma_{xj}}{1+t_x} - \tau'_j{}^{\text{ind}} - \sum_i \frac{\alpha'_{ij}}{1+t_i}} - 1$$

where  $\tau'_j{}^{\text{ind}}$  represents the percentage of indirect taxes in gross production. The primes symbolise the altered basis of the computation.

27. In general, import quotas lead to a reduction of import supply and therefore to a discrepancy between domestic and world market prices.<sup>34)</sup> This difference in prices (computed as percentage of world market price) is called the tariff-equivalent of an import quota or simply the implicit tariff. In computing effective rates of protection this implicit tariff can be handled the same way as a nominal tariff to calculate the free trade value added. In West Germany the international trade law ("Außenwirtschaftsgesetz") and its amendments reveal which commodities can be imported freely and which cannot. A detailed analysis of these regulations - carried out by Glisman and Neu<sup>35)</sup> - shows significant quotas only for various items of pit coal mining, textiles and clothing. But although Glisman and Neu estimated implicit tariffs for all items in question, we were able to include in our calculations only the tariff equivalents of pit coal and pit coal products for imports from non-member countries. These amounted to 24.7 per cent in

<sup>34)</sup> For a detailed analysis of this mechanism see H.H. Glisman and A. Neu, "Towards New Agreements on International Trade Liberalization - Methods and Examples of Measuring Nontariff Trade Barriers", Weltwirtschaftliches Archiv, 1971 (Vol. 107), pp. 235 sqq. - Hiemenz and v. Rabenau, op. cit., pp. 112 sqq.

<sup>35)</sup> Glisman and Neu, op. cit., pp. 241 sqq.

1964 and 39.4 per cent in 1968 and were used instead of the nominal tariffs on pit coal, coke and briquets to compute the effective rates of total protection for 1964 and 1970.

28. Besides tariffs and quotas, subsidies and taxes may result in trade barriers if they favour or discriminate against only a few and not all industries.<sup>36)</sup> Relevant in this context are subsidies to special branches, exemptions from the general tax rule and a differing taxation of imports, exports and domestic consumption. Subsidies as well as tariffs cause an increase of domestic value added, leaving consumers' prices, however - contrary to the case of tariffs - unchanged. Therefore the free trade value added of favoured products has to be adjusted for the subsidies while no adjustment is needed on the side of the industries consuming subsidised goods. Indirect taxes influence the competitiveness of domestic suppliers only in so far as internationally traded goods are taxed differently from domestic consumption. If, for example, a turnover tax is levied only on domestically produced goods - as in 1958 on crude oil<sup>37)</sup> - this tax diminishes the domestic producer price because domestic suppliers have to adjust their prices to import prices. Such a discrimination against domestic activities has to be ruled out when calculating free trade value added.

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<sup>36)</sup> This criterion arises because the possible trade effect of a general subsidy or tax will be nullified by a subsequent exchange rate adjustment which will be necessary to preserve a balance of payments equilibrium. Consequently direct taxes, general subsidies and regional development programs need not be considered since they favour single industries at most by chance. But this argument is controversial. For a different opinion see H.G. Grubel and H.G. Johnson, "Nominal Tariffs, Indirect Taxes and Effective Rates of Protection: The Common Market Countries 1959", The Economic Journal, 1967 (Vol. 77), pp. 761 sqq.

<sup>37)</sup> See Table 9.

29. Considering producers' subsidies and discriminations the basic formula has to be altered in the following way. An abolition of direct financial support diminishes the receipts of the industries in question and thus value added, given constant input prices. The share of financial support granted to an industry in the value of gross production ( $s_j^d$ ) can be handled like a tariff to reduce free trade turnover. On the other hand free trade turnover has to be increased if competing imports enjoyed tax reductions in the protection situation. An equal taxation of imports and domestically produced goods in the free trade situation leads to an increase of domestic producers' prices by the amount of the previous tax reduction ( $u_j$ ). This leads to:

$$E_j = \frac{1 - A_j' - \tau_j' \text{ind} - \sum_i \alpha'_{ij}}{\frac{d_j(1+u_j)}{(1+t_j)(1+s_j^d)} + \frac{1-d_j}{1+s_j^d} - \sum_i \frac{A_j' \gamma_{xj}}{1+t_j} - \tau_j' \text{ind} - \sum_i \frac{\alpha'_{ij}}{1+t_i}} - 1$$

30. Consumers of manufactured products may be subsidised or discriminated against by similar means as well. Thus consumers of inputs are favoured when exemptions from the general turnover tax reduce the prices of these inputs. By the same token subsidies to consumers can diminish input prices without changing the supply prices. In both cases a protection effect arises because the value added of the consumers is increased; therefore the respective free trade input coefficients have to be adjusted. A discrimination of consumers results from consumption taxes on special products - the heating oil tax for example<sup>38)</sup> - which are levied to lessen the competitiveness of these

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<sup>38)</sup> See Table 9.

products as against substitutes. Such taxes would be eliminated in a free trade situation.

31. Concerning the formula the different cases have to be distinguished.

An abolition of turnover tax preferences increases the consumer price of the products in question by the tax rate ( $u_i$ ), which then has to be paid. The same effect is caused by an abolition of tax reductions for imports, that is, free trade prices of these imports and of the competing domestic products go up by the amount of the former tax reduction ( $v_i$ ). On the other hand, if the heating oil tax is eliminated, the price of heating oil declines ceteris paribus and thereby increases the consumers' value added. The inputs of heating oil become less expensive according to the tax rate of heating oil ( $h_i$ ). The effective rate of total protection can be calculated as:

$$E_j = \frac{1 - A'_j - \tau'_j \text{ind} - \sum_i \alpha'_{ij}}{\frac{d_j(1+u_j)}{(1+t_j)(1+s_j^d)} + \frac{1-d_j}{1+s_j^d} - \sum_x \frac{A'_j \gamma_{xj}}{1+t_x} - \tau'_j \text{ind} - \sum_i \frac{\alpha'_{ij}(1+v_i)(1+u_i)}{(1+t_i)(1+h_i)}} - 1$$

Considering the non-traded input as in the calculation of effective tariff rates, our final formula for total effective protection emerges:

Formula For Calculating Effective Protection

$$1 - A'_j - \tau'_j \text{ ind} - \sum_i \alpha'_{ij} - \sum_k \alpha'_{kj}$$

$$\frac{d_j(1+u_j)}{t_j(1+s_j)} + \frac{(1-d_j)}{1+s_j} - \frac{A'_j \cdot \gamma_{xj}}{1+t_x} - \tau'_j \text{ ind} - \sum_i \frac{\alpha'_{ij}(1+v_i)(1+u_i)}{(1+t_i)(1+h_i)} - \sum_{kr} \alpha'_{kj} \beta_{rk} - \sum_{ki} \frac{\alpha'_{kj} \alpha_{ik}}{1+t_i} - \sum_{kmr} \alpha'_{kj} \alpha_{mk} \beta_{rm} - \sum_{kmi} \frac{\alpha'_{kj} \alpha_{mk} \alpha_{im}}{1+t_i} - \sum_{kmw} \alpha'_{kj} \alpha_{mk} \alpha_{wm}$$

Symbols

- $E_j$  Effective tariff rate of industry j
- $A'_j$  Depreciation coefficient of industry j
- $\tau'_j \text{ ind}$  Fraction of indirect taxes on the value of gross production of industry j
- $\gamma_{xj}$  Fraction of the investment-good x of the total investment of industry j
- $\alpha'_{ij}$  Input coefficient of traded inputs i, which are used in industry j
- $\alpha'_{kj}$  Input coefficient of non-traded inputs k, which are used in industry j
- $\beta_{rk}$  Input coefficient of the primary factors r necessary to produce the non-traded inputs k
- $\alpha_{ik}$  Input coefficient of traded inputs i necessary to produce the non-traded inputs k
- $\alpha_{mk}$  Input coefficient of non-traded inputs m necessary to produce the non-traded inputs k
- $\beta_{rm}$  Input coefficient of the primary factors r necessary to produce the non-traded inputs m
- $\alpha_{im}$  Input coefficient of traded inputs i necessary to produce the non-traded inputs m
- $\alpha_{wm}$  Input coefficient of non-traded inputs w necessary to produce the non-traded inputs m
- $d_j$  Domestic turnover of industry j as fraction of j's total turnover
- $t_j$  Nominal rate of tariff protection of industry j
- $t_x$  Tariff rate of investment-good x
- $t_i$  Tariff rate of traded inputs i used in the production of good j
- $s_j^d$  Fraction of direct financial support of the value of gross production of industry j
- $u_j$  difference between domestic turnover tax burden and respective tax on imports in percent of value of gross production (including subsidies)
- $u_i$  Turnover tax exemptions of a few product groups in percent of prices
- $v_i$  Difference between domestic turnover tax burden and respective tax on imports of the products under consideration in percent of prices
- $h_i$  Tax rate for heating oil
- The apostrophe means that the coefficients have been computed on the basis of value of gross production including subsidies



32. To include subsidies and tariffs in our calculations we carried out a detailed analysis of current and previous state regulations.<sup>39)</sup>

Although we compiled a rather comprehensive survey, for different reasons only a smaller part of the regulations fitting into our criterion could be applied to our computation. The main reason was that the volume of subsidies or tax savings had to be quantified as a percentage of gross production. This was possible only in cases of direct financial support and exemptions from indirect taxes. Tables 8 and 9 show the absolute values of the included regulations for the years under consideration and the tariff equivalents ( $s_d$ ) of the subsidies which represent the share of subsidies in the volume of gross production. According to Table 8 the calculation of effective protection was extended with respect to financial support to mining, extraction of crude oil and natural gas, shipbuilding, manufacture of aircraft and the production of electrical engineering goods. The highest subsidy in terms of tariff equivalent was granted to the manufacture of aircraft (13 per cent in 1970). The estimation of advantages and discriminations concerning consumers was less difficult. Table 9 shows that mainly consumers of mining products, iron and steel and crude oil and oil products enjoyed tax exemptions. The tax on heating oil, however, was levied in order to subsidise adjustment processes in pit coal mining to changing conditions of the energy market and has to be considered as discrimination against heating oil consumers.

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<sup>39)</sup> The results are published in Hiemenz and v. Rabenau, op. cit., pp. 177 sqq.

Table 8: Financial Support by the Federal Government and the Laender for the Manufacturing Industry - West Germany <sup>a</sup>

(only as far as Included in the Calculations of Effective Rates of Protection)

Branch of Industry, Description of Financial Support	1958	1964	1970
<b>PIT-COAL MINING</b>			
Support to promote rationalization in pit-coal mining (0902/68310)		25.5	
Subsidies to investment (0902/89206)			40.0
Subsidies to stabilize the sale of coke to the iron and steel industries (0902/68326)			143.0
Federal Support to the miners' pension funds reducing the entrepreneurs' share (1113/650; 6004/68302)		156.3	
Subsidies to the miners' health insurance (1113/603)	29.9	27.2	
	$\Sigma$	29.9	209.0
	$s_d^c$	0.002	0.014
			0.012
<b>LIGNITE MINING</b>			
Subsidies to the miners' health insurance (1113/603)	2.4	2.5	
	$\Sigma$	2.4	2.5
	$s_d^c$	0.002	0.001
<b>OTHER MINING</b>			
Federal support to the miners' pension funds reducing the entrepreneurs' share (1113/650; 6004/68302)		14.9	
Subsidies to the miners' health insurance (1113/603)	3.0	2.6	
Subsidy to the non-ferrous metal mining industry and support for excavating operations of the iron mining industry (0902/611)	1.4		
	$\Sigma$	4.4	17.5
	$s_d^c$	0.002	0.009
<b>CRUDE OIL, NATURAL GAS</b>			
Subsidies to German crude oil producers (0902/68302)		283.8	
	$\Sigma$	283.8	
	$s_d^c$		0.92
<b>MINERAL OIL PROCESSING</b>			
Temporary support for the production of lubricants from used oil (0902/68303)		9.6	
	$\Sigma$	9.6	
	$s_d^c$		0.001
<b>SHIPBUILDING</b>			
Subsidies to the shipbuilding industry (0902/66203; 6004/68302)			20.0 <sup>b</sup>
	$\Sigma$		20.0
	$s_d^c$		0.006
<b>MANUFACTURE OF AIRCRAFT</b>			
Support of aircraft technology (0902/86241, 89241)		17.1	150.0
	$\Sigma$	17.1	150.0
	$s_d^c$	0.015	0.131
<b>ELECTRICAL ENGINEERING GOODS</b>			
Support to the technical development of computers (0902/89231)			50.0 <sup>b</sup>
Promotion of the use of computers in the manufacturing industry (0902/68531)			10.0 <sup>b</sup>
	$\Sigma$		60.0
	$s_d^c$		0.002
<sup>a</sup> The figures mentioned for each subsidy refer to the respective paragraphs of the federal budget - <sup>b</sup> Government proposal - <sup>c</sup> For the explanation of symbols see paragraph 34.			

Source: See Table

Table 9 :

## Tax Exemptions for the Manufacturing Industry - West Germany

(only as far as Included in the Calculations of Effective Rates of Protection)

Description of Tax Exemptions		1958	1964	1970
Exemption from turnover tax for solid combustibles in wholesale trade (\$ 4 Ziff. 4 UStG, Freiliste 3 Nr. 2) <sup>a</sup>	$u_i^b$	.	0.017	
Exemption from turnover tax for smelting materials and smelting products for producers and wholesale traders - "Verhüttungsprivileg" - (§ 4 Ziff. 26 UStG, i.V.m. § 4 Ziff. 4 Freiliste 3 Nr. 9a, c und 12)	$u_i^b$	0.05	0.05	
Exemption from turnover tax for crude oil in wholesale trade (\$ 4 Ziff. 4 UStG, Freiliste 3 Nr. 4)	$u_i^b$	0.010	0.010	
Exemption from mineral oil tax for mineral oils used in oil processing (\$ 3 MinöStG)	$u_i^b$	.	0.04	0.055
Exemption from turnover tax for gasoline, lubricants, liquid heating materials made from oil, coal, etc. for producers and wholesale trade - "Mineralöl- privileg" - (§ 4 Ziff. 4 UStG, Freiliste 3 Nr. 5; §4b UStG)	- Wholesale Trade:	$u_i^b$	0.010	0.010
	- Producers:	$u_i^b$	0.040	0.040
Exemption from turnover tax for iron and steel in wholesale trade (\$ 4 Ziff. 4 UStG, Freiliste 3 Nr. 9b)	$u_i^b$	.	0.010	
Exemption from turnover tax for cotton in wholesale trade (\$ 4 Ziff. 4 UStG, i.V.m. Freiliste 3 Nr. 1)	$u_i^b$	0.010	0.010	
Exemption from turnover tax for "Linters" in wholesale trade (\$ 4 Ziff. 4 UStG, i.V.m. Freiliste 3 Nr. 1)	$u_i^b$	0.010	0.010	
Exemption from turnover tax equivalent for imports of crude oil (Freiliste 1 Anlage 2 der Ausgleichsteuerordnung)	$u_j = v_i^b$	0.040		
Specific tax on heating oil (§ 8 Abs. 8 MinöStG); which in turn is used to subsidize adjustment processes in pit-coal mining to the changing conditions of the energy market (Artikel 4, Gesetz zur Änderung des MinöStG, vom 26.4.1960)	- Light Heating Oil:	$h_i^b$	0.105	0.097
	- Heavy Heating Oil:	$h_i^b$	0.409	0.4155

<sup>a</sup>Respective paragraphs of federal laws and special amendments - <sup>b</sup>For the explanation of symbols see paragraph 36.

Source: Federal budget and budgets of the Laender, die Finanzberichte des Bundesministeriums der Finanzen, die Bundestagsdrucksachen III/1229, July 28, 1959, V/2423, December 21, 1967, and VI/391, February 16, 1970, der Bundeshaushalt nach Sachgebieten, Ergänztter Sonderdruck aus den Finanzberichten (der entsprechenden Jahrgänge) des Bundesministeriums der Finanzen, Zavlaris, D.: Die Subventionen in der BRD seit 1951, Deutsches Institut für Wirtschaftsforschung, Beiträge zur Strukturforchung, Heft 14, Berlin 1970, Personal calculation.

33. Thus the final computation of effective rates of total protection includes, besides tariffs, import quotas for pit coal mining, direct financial support, exemptions from turnover tax and the mineral oil tax as a discriminating consumer tax. The results are shown in Table 10. First of all it is striking that effective rates of protection generally exceed effective tariff rates. This results mainly from a change in the method of computation and not from the inclusion of additional protective measures. The consideration of taxes and subsidies in this final computation allowed for an exclusion of indirect taxes from value added. In this way the basis of the calculations is diminished, resulting in a higher rate of effective protection even for those branches which are granted only tariff protection. The average increase amounts to one-third of effective tariff rates. The average escalation effect went up from the previous 33 per cent to more than 100 per cent above nominal tariff rates.

34. A comparison between effective rates of total protection and effective tariff rates reveals the following peculiarities:

- Effective rates of total protection as well as effective tariffs reflect the harmonisation of tariffs within the EEC and the GATT. The average rate of total protection towards non-member countries first increased from 14.9 per cent in 1958 to 22.1 per cent in 1964 and subsequently declined to 19.3 per cent in 1970. Other than the tariff rate, the total protection for 1970 was not cut back to the 1958 level. In 1970 the effective rate for industry as a whole was

Effective Protection <sup>a</sup> of the Branches of Industry, West Germany  
1958, 1964 and 1970

Branch of Industry	Effective Protection			
	1958		1964	
	Against Imports From			
	non-EEC-Countries	EEC-Countries	non-EEC-Countries	non-EEC-Countries
<u>Mining Products</u>	0.8 <sup>b</sup>	3.6 <sup>b</sup>	52.2 <sup>b</sup>	102.1 <sup>b</sup>
Coal Mining, Coking	0.5	4.1	65.6	128.3
Lignite and Bituminous Coal Mining	-2.2	-0.2	-3.4	-2.9
Crude Oil, Natural gas, etc.	-	-	-	-
Other Mining	5.4	2.9	3.1	2.5
<u>Primary and Producers' Goods</u>	23.5 <sup>c</sup>	5.3 <sup>c</sup>	30.2 <sup>c</sup>	19.4 <sup>c</sup>
Stone and Earthen Goods	1.6	0.4	12.0	4.4
Iron and Steel Production	33.3	15.9	39.0	23.8
Iron, Steel and Malleable Iron Foundries	13.4	2.7	23.4	18.7
Drawing Plants and Cold Rolling Mills	5.6	3.9	8.5	7.3
Non-ferrous Metal Production	31.4	22.8	68.2	30.3
Non-ferrous Metal Foundries	35.6	14.8	73.7	39.4
Mineral Oil Processing	-	0.8	60.5	168.4
Chemical Products and Coal Derivatives	18.0	5.1	24.6	16.0
Sawmills and Woodworking	15.9	3.6	19.0	13.1
Pulp, Paper and Paperboard Production	51.3	5.6	53.5	42.1
Rubber and Asbestos Goods	27.8	5.1	29.2	15.7
<u>Investment-Goods Industries</u>	5.5	1.0	9.3	7
Structural and Light Metal Engineering Goods	0.6	0.2	5.8	3
Steel Shaping	16.6	3.9	21.0	12.3
Mechanical Engineering Goods	0.8	0.4	4.0	3.7
Manufacture of Road Vehicles	11.0	2.3	14.5	9.4
Shipbuilding	-14.9	-2.6	-14.6	-10.9
Manufacture of Aircraft	24.0	3.4	1.8	73.2
Electrical Engineering Goods	5.1	-0.4	9.2	8.1
Precision and Optical Goods	3.4	1.2	7.9	6.9
Clocks and Watches	2.7	1.2	5.8	4.5
Iron, Steel, Sheet and Metal Goods	8.4	2.5	15.3	11.0
<u>Consumer-Goods Industries</u>	20.4	3.6	24.4	20.6
Fine Ceramics Products	9.5	1.7	18.3	18.7
Glass and Glass Products	16.7	3.0	22.8	15.1
Manufacture of Wood Products	23.1	2.1	24.3	17.5
Musical Instruments, Sporting Goods, Toys	6.3	2.8	13.8	10.6
Paper and Paperboard Products	29.7	5.9	29.2	27.4
Printing and Reproduction	4.3	1.3	9.6	8.3
Plastic Products	8.8	1.6	13.0	9.5
Leather (Production, Tanning)	11.6	3.1	13.0	11.2
Leather Goods	21.0	3.8	26.3	19.1
Shoes	26.2	4.4	30.6	15.1
Textiles	24.9	5.2	29.3	25.6
Clothing	20.9	3.2	26.0	25.1
<u>Total Industry</u>	14.9 <sup>b,c</sup>	3.4 <sup>b,c</sup>	22.1 <sup>b,c</sup>	19.3 <sup>b,c</sup>

<sup>a</sup>On the basis of the Input-Output Matrix of the Ifo Institute for Economic Research, Munich, for the years 1961 and 1964. - <sup>b</sup>Without crude oil, natural gas, etc. - <sup>c</sup>Without mineral oil Processing.

Source: Personal Calculation

4.4 per cent higher than in 1958. On the other hand the total protection against member countries continuously declined since 1958 as tariff protection declined.

- The consideration of nontariff trade barriers does not alter the structure of protection significantly. Primary and producers' goods industries as well as consumers' goods industries still enjoy higher protection on an average than investment goods industries. But coal mining, being scarcely protected by tariffs, turns out to be the most highly protected branch.
- The rates of total protection show, in addition, that certain branches of industry are granted more nontariff than tariff protection. This is especially true for pit coal mining (import quotas and financial support), iron and steel production, non-ferrous metal production and foundries as well as mineral oil processing (tax exemptions).

35. The main reason that the rate of total protection for 1970 did not decline to the 1958 level is the protection of mining in recent years. For the other sections of industry no important differences in regard to tariff protection can be observed as far as the structure and the intertemporal changes in total protection are concerned. Yet it may be noted that the rate against non-member countries for primary and producers' goods declined more rapidly than the average rate did between 1964 and 1970. This is mainly based on the fact that all tax exemptions were no longer effective subsequent to the establishment of

the value added tax in 1968. Since iron, steel and non-ferrous metal production and processing were especially affected by this measure in 1970, their effective rates of protection were cut back to half of the 1964 values.

36. Although the trade within EEC countries was also affected by nontariff distortions (3.4 per cent total protection against a tariff rate of 1.9 per cent in 1964), the total protection against EEC competitors is negligible in general. The only exceptions are the primary and producers' goods industries which in 1964 still enjoyed large tax exemptions. Since these measures were abolished and since even in 1964 total protection was low, no effective rates of total protection have been calculated for 1970.

37. As available data and our computations reveal, pit coal mining is one of the most heavily protected branches of industry in West Germany in terms of the effective rate as well as of the variety of protective devices. Starting from 1958 when pit coal mining was hardly protected against imports from non-member countries, import quotas led to an ever increasing gap between domestic and world market prices. This gap amounted to 24.7 per cent in 1964 and even widened to 39.4 per cent in 1970.<sup>40)</sup> Besides import quotas pit coal mining was supported by exemptions from turnover tax (for solid combustibles) and by annually increasing financial subsidies (300 million DM in 1970). Thus the effective rate of total protection grew from 0.5 per cent in 1958 to

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<sup>40)</sup> See paragraph 27.

65.2 in 1964 and 128.3 in 1970 (Table 10). Nevertheless these results do not describe the actual protection, because - as mentioned above - a certain number of additional subsidies could not be included for methodological reasons. Among these are:

- financial support to the iron and steel producers to subsidise consumption of pit coal and coke ("Kokskohlenbeihilfe")
- financial support and tax exemptions in order to promote sales of coal instead of other energy (that is, transportation subsidies or investment subsidies for the construction of power stations operating with coal)
- subsidies for rationalisations and close-downs
- state loan guarantees for pit coal mining amounting to 3.966 million DM up to 1970
- high taxes on mineral oil favouring pit coal consumption.

38. For shipbuilding the same is true regarding the effective rate of total protection as had been mentioned concerning the tariff rate: the computed rate does not reflect total protection. This comes about partly because tariff exemptions were not considered, and partly because some important subsidies, for example, sales promoting measures and investment support, could not be included in our calculations. West German shipping companies are granted a 10 per cent reduction of prices for any order to German shipbuilders, a reduction of interest on loans to finance orders and substantial depreciation facilities. Furthermore, capital investment in shipbuilding may be



depreciated over a shorter than normal time period and the depreciation may exceed 100 per cent. Concerning these subsidies, it must be concluded that shipbuilding is not at all a discriminated branch of industry.

39. The effective rate of total protection for manufacture of aircraft is also too low compared to the actual situation, although it amounted to 73.2 per cent in 1970. We disregarded the tariff exemptions of the Common Tariff<sup>41)</sup> for certain inputs. Also, we could not take into consideration some project-oriented subsidies (for example the Airbus project), because neither the favoured companies nor the time schedule of the support could be determined correctly.
40. The remarkably high effective rates for mineral oil processing (60.5 per cent in 1964 and 168.4 per cent in 1970) result from the consideration of indirect taxes. The computed rates reflect the large share of indirect taxes in total value added (43 per cent in 1964) rather than tax preferences. The denominator of our formula, that is the actual income of labour and capital (excluding indirect taxes), amounts to only 8.7 per cent of the value of gross production. This extremely small value added is affected significantly by tariffs and subsidies, for instance, tax exemptions for oil used in oil processing (Table 9), and thus leads to high effective rates even on the basis of a minor nominal tariff or nontariff protection.

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<sup>41)</sup> See Common Tariff, op. cit., Appendix A.

## VII. CONCLUDING REMARKS

41. Leaving aside the details, our calculations give evidence that protection of West German industry is much higher than judged from nominal tariff rates. The most important means of protection are, without any doubt, tariffs, while nontariff trade barriers favour only a few selected branches and do not have a more general impact. High protection in absolute and relative terms is granted to those branches which suffer from heavy import competition. Specifically, raw material and/or labour intensive industries benefit most from the discrimination against foreign suppliers. Although this structure of protection is an outcome of historical development rather than of an intended economic policy, it reveals an important argument for the current discussions concerning the international division of labour. The structure of West German protection - and the same is true for most industrialised countries - mainly reduces the access of developing nations to her markets because these nations are typically the main competitors regarding raw material and labour intensive products. Therefore, if developing nations are to be granted a better chance for export-orientated growth, international trade agreements should consist of specific rather than of linear tariff reductions. Thus an integration of developing nations into the international division of labour and, by the same token, a structural adjustment process within the industrialised nations will be enhanced, which may help both parties to be better off in the future.