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# Specialization of Production – A Factor of Integration

by Albrecht Iwersen, Hamburg \*

The statute of the Council of Mutual Economic Assistance (CMEA) assigns to the institutions of the council the task to promote the process of specialization and cooperation in the production sector of the national economies. The development of the relations between the member countries indicates that especially in recent years this production specialization became a more and more important factor of integration.

Specialization and cooperation in the sphere of production did not always play a major role in the relations between the nine CMEA-member-countries<sup>1</sup>. During the last years, however, observers could notice an increasing number of bilateral or multilateral agreements concerning specialization and cooperation with regard to certain productions. In the following the character of this factor of integration is examined and an attempt is made to determine its efficiency.

## Possible Benefits

The CMEA-countries see possible benefits of a deepening cooperation in the form of a production specialization predominantly in the fact that

- ☐ production in large series becomes possible and economies of scale can be exploited;
- ☐ the uneconomic parallelity of production in the CMEA-region can be discharged or avoided;
- ☐ the efficiency of the given production structures may increase, if the benefits of the international distribution of production plants to the respective CMEA-countries are taken into account fully;
- ☐ by higher production concentration a rise in quality of the finished or semi-finished products and a faster integration of research and development results into the production sphere can be achieved;
- ☐ stable economic and trade relations may, in the long term, be built up between all CMEA-partners, and finally that
- ☐ this instrument can lead to an increase in the productivity of labour and economic growth in all member countries.

Specialization and cooperation are often regarded as factors forming a single unit. This viewpoint

is, above all, the result of the existing close functional relations between both. To examine, however, the various forms of specialization and cooperation and their utility for the economic process, we have to analyse, for a start, both conceptions separately.

## Different Definitions

In general, specialization is a concentration process in the direction of a previously defined reference figure; in this meaning specialization of production would be a concentration on the production of single products or groups of products. In the CMEA-countries, specialization of production is understood as a form of division of labour, a point of view being equivalent to that in the market economies. On the basis of a planning coordination between all CMEA-member-countries, four *specialization lines* must be distinguished:

- ☐ firstly the "objective" specialization which encloses technologically and by construction principle similar product groups;
- ☐ secondly a specialization on selected product units or building units of a certain production programme;
- ☐ thirdly the specialization on certain complete production operations or a special technological process;
- ☐ fourthly the "complete" specialization on equipment units as well as on machinery systems or certain technologies as a whole<sup>2</sup>.

In market economies, cooperation is being used in the sense of a working together of two or more

<sup>1</sup> At present, the CMEA has nine active members: Bulgaria, Czechoslovakia, Cuba, The German Democratic Republic (GDR), Hungary, Mongolia, Poland, Rumania and the USSR.

<sup>2</sup> See K. Morgenstern, Sozialistische Internationale Arbeitsteilung (Socialistic International Division of Labour), Berlin 1972, p. 141.

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firms which — as a rule remaining independent units — institutionalize certain common functions in order to achieve an increase in profitability by means of rationalization or division of labour. In general, in the market economy three forms of cooperation are known<sup>3</sup>: the *horizontal* cooperation, i.e. the collaboration of two or more firms — belonging to the same economic branch — on the subject of similar or substitutive goods; the *complementary* cooperation, i.e. a supplementary working together of enterprises; and finally the *vertical* cooperation between enterprises with different production subjects, e.g. extraction of ore and pipeline production.

Comparing this market-determined definition of cooperation with that of the CMEA-terminology, one may recognize a lot of technological and operational similarities. The economic aims, however, relating to an international cooperation, are diverging fundamentally. The CMEA-countries regard cooperation merely as an efficient instrument for achieving a higher degree of concentration and specialization of production. Sales considerations which usually play the dominant role in cooperation agreements between enterprises in market economy countries, count for nothing in CMEA-cooperation.

In the literature of the CMEA there exists no unequivocal use of the terms "international cooperation" and "international specialization"; in many cases both are seen with reference to the multiplicity of forms of cooperation and specialization promoting the intergration process through their effects on the international division of labour.

### Measurement of Specialization Effects

The different forms of specialization and cooperation can be subdivided into the *bilateral* form, the *multilateral* form, the *firms' association* and the *territorial* (countrywise) form of specialization. The results of an empirical study<sup>4</sup> indicate that the bilateral form of specialization and cooperation clearly dominates in the production sector of all CMEA-economies: of the random sample of analysed specialization projects about

- ☐ 66 % were of the bilateral form,
- ☐ 23 % were of the multilateral form,
- ☐ 17 % were firms' associations and only
- ☐ 11 % fell to the share of the territorial specialization<sup>5</sup>.

<sup>3</sup> See e.g. H. Schmidt, Kooperation als Instrument der Verkehrs- und Gewerbepolitik (Cooperation as an Instrument of Transportation and Industrial Policy), in: H. Schmidt (ed.), Kooperation im Verkehr (Cooperation in Transportation), Bad Godesberg 1969, p. 17 ff.

<sup>4</sup> See A. Iwersen, Spezialisierung und Kooperation im Rat für gegenseitige Wirtschaftshilfe (Specialization and Cooperation in the CMEA), HWWA-Report No. 45, Hamburg 1977.

These four forms of specialization and cooperation contribute towards an efficient international division of labour within the CMEA to a different extent. The benefits of all specialization forms can be measured by means of ten indicators which, to some extent, are interdependent<sup>6</sup>. These are the development of the export and import volumes; the decline of the cost level; the degree of concentration in production and research; the level of profitability of production as well as of ex- and imports; further on the developments of the uniformed turnovers as part of the gross domestic product, the volume of investments, the material inputs, the degree of rationalization and automation, the standard of the working and living conditions of the employees and, last but not least, the degree of specialization of these employees.

In a number of research studies attempts have been made to quantify the specialization benefits by more or less sophisticated mathematical methods<sup>7</sup>. In practise, the effects of specialization and cooperation are usually measured — only partially in quantitative terms — by means of evaluation systems similar to the wellknown cost-effectiveness- or utility analyses. The analyses published so far indicate a positive effect on the CMEA-integration.

### Participation by Countries

Considering this, it is not surprising that since 1971 an increasing number of international specialization and cooperation projects can be observed in the CMEA-countries. In considering to what extent the individual national economies participate in the integration process, the key question — in how many of the analysed specialization projects (random sample) does a certain CMEA-member-country participate? — yielded the following results<sup>8</sup>: Only one country, the Soviet Union, participates in more than 50 % of all specialization projects. The USSR is followed by a group of higher industrialized countries (participation between 45 and 35 % of all projects), the German Democratic Republic, Hungary and Poland. The less industrialized CMEA-countries form another group with a degree of participation between 35 and 15 % in the international CMEA-specialization: the CSSR, Bulgaria and Rumania (rank numbers 5 to 7); "tail-lights" in specializa-

<sup>5</sup> The percentages do not add to 100 as the reference figures are not excluding one another.

<sup>6</sup> Cf. B. Scheel, Effektive arbeitsteilige Beziehungen in den Mitgliedstaaten des RGW (Effective Division of Labour in the CMEA-Member-States), in: Sozialistische Außenwirtschaft, Vol. 23 (1973), No. 2, p. 3.

<sup>7</sup> See for example B. Ladygin, W. Terechow, Die Bestimmung des Nutzeffekts der internationalen Produktionsspezialisierung (Determination of Utility of the International Production Specialization), in: Außenhandel, Vol. 16 (1966) No. 8, p. 25 ff.

<sup>8</sup> See A. Iwersen, Spezialisierung . . . , op. cit.

tion are the two developing countries Cuba and Mongolia with less than 10 %.

All this suggests that the participation of a CMEA national economy in the process of specialization of production is predominantly dependent on the economy's degree of industrialization. This conclusion is supported by the analysis of the economic sectors in which specialization is practised.

### Sector Analysis

The figures in the study indicate a great variety in the magnitude of shares of the individual economic sectors. The machinery and metal industry which has already for some decades played a very important role in the foreign trade of the CMEA, is presently ranking number one. With nearly 50 % its share of all analysed cooperation and specialization projects is four times higher than that of energy and natural resources, the next ranking sector (12 %). Among the thirteen sectors which were considered in the analysis, eight have a share of less than 5 %. The most important sectors of CMEA-specialization are:

- ☐ industrial plants as a whole,
- ☐ chemical industry,
- ☐ electronics and electro-technics,
- ☐ energy and natural resources,
- ☐ foodstuffs incl. agricultural products,
- ☐ machinery and metal industry, and
- ☐ transportation.

The cooperation and specialization in the sector of chemical industry can be regarded as typical in the CMEA. As the chemical industry is a relatively modern branch the specialization takes place predominantly between the USSR, the GDR, Czechoslovakia, Poland and Hungary. The USSR participates in more than 60 %, the GDR in about 53 %, the CSSR in nearly 40 %, Poland and Hungary in about 35 % of all projects. As regards the form of cooperation and specialization it is obvious that the chemical industry prefers the specialization on the basis of bilateral and/or firms' agreements. As in many other, so-called "modern" sectors of production, the relatively low share of multilateral agreements and territorial specialization is above all traceable to the necessity of a very close production- und process-technical harmonization. The tasks of multilateral cooperation and specialization agreements in the chemical industry, as e.g. "INTERCHIMVLAKNO", are on a coordination rather than on a production level. The situation in the machinery and metal industry is similar, with the exception that the specialization on the level of firms' associations is — for historical reasons — less developed.

Energy and natural resources is one of the economic sectors where multilateral specialization and cooperation agreements dominate. To some extent, this sector is a special case: since in the CMEA the resources endowment differs widely from country to country mutual aid is a very important political aim in this field. About 50 % of the analysed projects for energy and natural re-

**Distribution of the 300 Analyzed Projects on Production Specialization and Cooperation by CMEA Countries and Sectors**

| Sector   | Bulgaria | CSSR | GDR | Cuba | Mongolia | Poland | Rumania | USSR | Hungary | CMEA total |
|--|----------|------|-----|------|----------|--------|---------|------|---------|------------|
| 1. Industrial plants                                     | 9        | 6    | 6   | 4    | 1        | 9      | 6       | 23   | 6       | 33         |
| 2. Building industry                                     | 1        | —    | 1   | 1    | —        | 2      | —       | 1    | —       | 3          |
| 3. Chemical industry                                     | 5        | 9    | 12  | —    | —        | 8      | 1       | 14   | 8       | 23         |
| 4. Electronics and electro-technics                      | 7        | 5    | 11  | 3    | 1        | 9      | 3       | 10   | 8       | 17         |
| 5. Energy and raw Materials                              | 18       | 17   | 17  | 7    | 11       | 20     | 19      | 25   | 22      | 36         |
| 6. Glass and ceramics                                    | 1        | 1    | 1   | 1    | —        | —      | —       | —    | 2       | 3          |
| 7. Timber and paper                                      | 1        | —    | 3   | —    | —        | 4      | —       | 3    | 3       | 7          |
| 8. Light industries                                      | 1        | —    | 1   | —    | —        | 1      | 2       | 1    | —       | 3          |
| 9. Foodstuffs (incl. agricultural products)              | 5        | 2    | 5   | 2    | 1        | 2      | 1       | 8    | 6       | 12         |
| 10. Machinery and metal processing                       | 28       | 49   | 53  | 3    | —        | 42     | 22      | 76   | 59      | 143        |
| 11. Pharmaceutical industry                              | 1        | —    | —   | —    | —        | 1      | —       | 1    | 1       | 2          |
| 12. Shipbuilding   | 3        | —    | 3   | —    | —        | 4      | —       | 1    | —       | 6          |
| 13. Textiles and clothing                                | —        | 2    | 7   | 1    | —        | 4      | —       | 2    | —       | 8          |
| 14. Transportation                                       | 6        | 8    | 11  | 3    | 4        | 11     | 6       | 12   | 8       | 18         |
| Total number of projects in 1—14                         | 96       | 99   | 131 | 25   | 18       | 117    | 60      | 177  | 123     | 314        |
| ./. Number of projects belonging to more than one sector | 10       | 3    | 6   | 2    | 1        | 5      | 6       | 9    | 6       | 14         |
| Total number of agreements                               | 86       | 96   | 125 | 23   | 17       | 112    | 54      | 168  | 117     | 300        |

sources were firms' associations. The regional structure of the participation in specialization indicates, in accordance with the resources endowment, a dominating role of the Soviet Union.

In no other economic sector a greater variety in the character of projects can be found; the combination of projects is in practise largely determined by the kind of the produced raw material or form of energy, the multiplicity of the fields of activity and thirdly the system-characteristics. The international division of labour within the CMEA-specialization comprises in this case not only the working and exploitation processes but also the earlier stages of production, i.e. prospecting and exploration, as well as the later stages of production, i.e. semi-finished industrial goods. The transformation process of primary into secondary energy is similarly circumstanced. The cooperation projects reflect this multiplicity: one can find, for example, very successful multilateral firms' associations in the stage of exploration and prospecting of mineral resources; common offshore-drilling and prospecting the continental shelf (f.e. PETROBALTIC) are only one example for "modern" cooperation and specialization projects.

#### Effects on Intra-CMEA Trade

Between the Intra-CMEA-Trade (ICT) and the specialization and cooperation in the production sector there exist close functional relationships. In the special case of raw materials and energy this is quite evident, as in this sector there prevails a kind of "natural" specialization due to

which certain countries, e.g. Czechoslovakia<sup>9</sup>, have become highly dependent on energy and raw material imports. Less evident but nevertheless recognizable are the functional relationships between specialization and ICT in the other analysed economic sectors. Especially in the metal and machinery industry it becomes apparent that the international distribution of production plants to the individual CMEA-countries is the most essential link between foreign trade flows and domestic production and marketing.

The development of the ICT-relations indicates for the period since about 1965<sup>10</sup>, that the growth of mutual trade differs naturally from country to country, but the development has always been a positive one<sup>11</sup>. The structures of ICT have changed, which suggests that the process of the international specialization of production has had an increasing and, in relation to the aims of the CMEA, positive effect on foreign trade.

<sup>9</sup> The energy and petrochemical industry of the CSSR was in 1976 importing 97.0% of the needed crude oil from the Soviet Union. Cf. R. Tchakhamakhtcheva, Tschechoslowakei (Report on the CSSR), in: K. Bolz, H. Clement, U. Dietsch, A. Iwersen, P. Pissulla, R. Tchakhamakhtcheva, and P. Plötz, Die Wirtschaftliche Entwicklung in Osteuropa zur Jahreswende 1976/77 (Economic development in Eastern Europe at the Turn of the Year 1976/77), HWWA-Report No. 40, Hamburg 1977, p. 198.

<sup>10</sup> Only in relation to the European CMEA-countries; corresponding figures for non-European members were not available.

<sup>11</sup> See in detail: K. Bolz, H. Clement, U. Dietsch, K.-H. Heppner, P. Plötz, B. Schwarz, P. Wilke, Die wirtschaftliche Entwicklung in Osteuropa bis Ende 1973 (Economic Development in Eastern Europe until late 1973), HWWA-Report No. 28, Hamburg 1974; and K. Bolz, H. Clement, U. Dietsch, A. Iwersen, P. Pissulla, P. Plötz, and B. Schwarz, Die wirtschaftliche Entwicklung in Osteuropa zur Jahreswende 1975/76, Hamburg 1976, HWWA-Report No. 37.

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